



Climate Report

# **VEOLIA'S NET ZERO STRATEGY IN ACTION**



# VEOLIA IS A WORLD LEADER IN DECARBONIZING, CONSERVING AND REGENERATING RESOURCES, AND REDUCING POLLUTION

## Ecological transformation, that is our Purpose

Ecological transformation means acting to reconcile human progress and environmental protection.

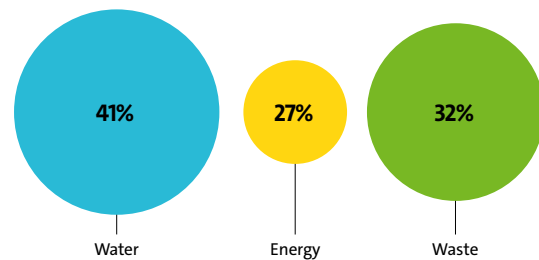
We develop and implement locally solutions to depollute our vital resources and preserve them from depletion, solutions to decarbonize our ways of living and producing and adapt them to the consequences of climate change.

All over the world, attuned to local cultures, we strive to improve the health and quality of life of communities.

At Veolia, we tackle economic, social and environmental issues as an inseparable whole to the benefit of the largest number of people.

Find the full version of our Purpose at [veolia.com](https://veolia.com)

### Revenue share by business



Almost

## 218,000<sup>(1)</sup>

employees

## 13.8 Mt CO<sub>2</sub> eq.

on scope 4 in 2023<sup>(1)(2)</sup>

## €45.4 billion

in revenue in 2023

## 58 countries

where Veolia has a permanent installation with employees and more than €5 million of capital employed

(1) Provisional figure at time of publication. The final figure will be published in Veolia's 2023 URD.

(2) In 2023, Veolia changed its methodology to better align with WBCSD best practice. This new methodology led the Group to review its Scope 4 emissions in 2023, which have dropped from 15.5 Mt CO<sub>2</sub> eq., according to the old method, to 13.8 Mt CO<sub>2</sub> eq., with the new method. The emissions reported in the Impact 20–23 strategic plan were calculated using the old method. The new methodology applies to the GreenUp plan from 2024.

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# EDITORIAL

Estelle Brachlianoff, Chief Executive Officer of Veolia

In its special report on the consequences of global warming of 1.5 °C, adopted in 2018, the IPCC<sup>(1)</sup> stated: “limiting warming to 1.5 °C is possible within the laws of chemistry and physics, but would require unprecedented transitions in all aspects of society.” This includes reducing our greenhouse gas emissions, protecting and restoring our at-risk natural carbon sinks, and capturing, storing and utilizing CO<sub>2</sub>.

Veolia, as the global champion of ecological transformation, is committed to helping meet the climate challenge by acting to decarbonize our societies and help them adapt to the changes that are already taking place. This commitment is fully in line with the Group’s purpose: acting to reconcile human progress and environmental protection.

In July 2024, our near-term target (2032) and our Net Zero target have been validated by the SBTi.

Indeed, in february 2024, Veolia has announced an ambitious trajectory – the fruit of work done in preparing its 2024-2027 strategic program – to achieve Net Zero by 2050, specifically zero carbon emissions from its activities and the neutralization of its residual emissions. To this end, the Group is accelerating its decarbonization effort by committing to reduce its scopes 1 and 2 emissions by 50%, and its scope 3 emissions by 30%<sup>(2)</sup>, by 2032 (compared with 2021).

This Climate Report, published simultaneously with GreenUp – our strategic program 2027 – is a tool we are making available to our stakeholders to explain our updated climate strategy. It meets the requirements of the TCFD<sup>(3)</sup>, covering the governance, risk management policy, and performance indicators we have in place. In fact, it goes further, detailing the financial resources the Group has mobilized: over €1.6 billion in investment by 2030, including €500 million already invested between 2018 and 2023. It also details the operational levers and innovations we have dedicated to reducing the hard-to-eliminate emissions connected with the use of natural gas for our heat networks and the incineration of hazardous waste.

It also illustrates the uniqueness of our service activities. These are services essential for human life and economic activity with considerable benefits to public health, environmental protection and biodiversity. Services that also have the characteristic of erasing emissions for their beneficiaries: this is why we also present an ambitious trajectory for our “scope 4” emissions to illustrate the decarbonizing power of the solutions we provide to our customers.

In addition to decarbonization, this report outlines Veolia’s pioneering approach to adapting to the effects of climate change. Our unique expertise and know-how in water, the main vector by which the consequences of climate change make themselves felt, position us perfectly to help all stakeholders design and implement their adaptation strategies. By anticipating possible climate changes and their effects at the local level as accurately as possible, across the 2,000 assets it operates, we equip the Group and its stakeholders to tackle this additional challenge.

With this Climate Report, I hope to be able to show all our stakeholders, in particular the economic players – companies and financial institutions alike –, that a realistic and ambitious climate strategy is possible. We offer a simple equation: 50% fewer scopes 1 and 2 emissions in 10 years, and 50% more “erased” emissions on scope 4. This means applying our 170-year recipe for success, using the following ingredients: planning, operational efficiency, agility and innovation. In the climate context to come, each of these ingredients will play a key role.

(1) Intergovernmental Panel on Climate Change.

(2) Across 67% of the scope 3 total in line with the medium-term target defined by the SBTi.

(3) Task Force on Climate-related Financial Disclosures.





# OUR CO<sub>2</sub> PICTURE

In this section, we offer a comprehensive examination of our carbon footprint. From the detailed analysis of our CO<sub>2</sub> profile to our ambitious efforts to reduce emissions, each aspect is testament to our determination to meet this major challenge of our time. We foreground our decarbonization strategy, emphasizing the importance of each initiative in the fight against climate change.

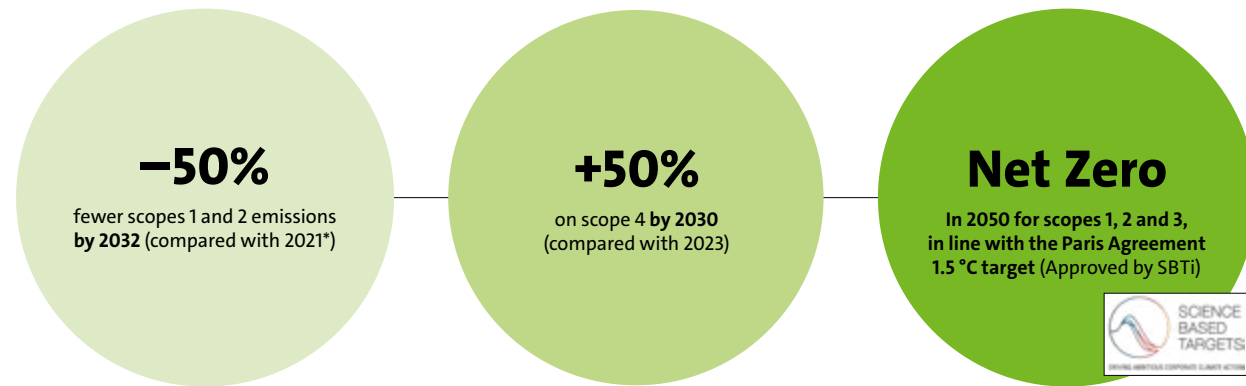




# VEOLIA IS ACCELERATING ITS DECARBONIZATION

For almost 10 years, we have been making strong commitments on reducing our greenhouse gas (GHG) emissions. We are now intensifying our efforts by implementing a Net Zero strategy involving all our businesses and geographical zones in order to achieve carbon neutrality by 2050.

## OUR DECARBONIZATION COMMITMENTS IN FIGURES:



We have committed to massive investment in decarbonizing our activities, with €500 million already invested between 2018 and 2023.

## 2015

Commitment to the UN's<sup>(1)</sup> 2030 Sustainable Development Goals, including Climate Action

## 2017

Commitment to defining a firm GHG<sup>(2)</sup> reduction target (scopes 1 and 2) for the medium term across the entire Group

## 2018

Launch of the plan to phase out coal and convert the plants powering the Group's heat networks

## 2019

Commitment SBTi: 22% reduction by 2034 compared with 2018 (trajectory to limit warming to 2 °C)

## 2024

**NET ZERO 2050 STRATEGY**  
Rollout of Net Zero strategy in 2024. Veolia near term and Net Zero targets have been validated by SBTi. Recognition by the international rating agency Moody's of the quality of Veolia's transition plan, awarding the company an overall score of NZ-2 on a scale from NZ-1 to NZ-5

## 2032

**50% REDUCTION IN GHGS (SCOPES 1 AND 2):** (vs. 2021)

## 2050

**NET ZERO**  
90% reduction in GHG emissions and neutralization of the residual emissions

\* Veolia's pro forma 2021 emissions are the sum of Veolia's emissions published in 2021 and the 2021 emissions from the Suez businesses acquired and still held at the publication date of this document.  
(1) United Nations.  
(2) Greenhouse Gas.

# MOST OF VEOLIA'S EMISSIONS CONSIST OF 3 GREENHOUSE GASES...

In the main, our activities generate 3 different greenhouse gases, each with different effects on global warming. Their warming potential is expressed in "CO<sub>2</sub> equivalent" (CO<sub>2</sub> eq.).

## Carbon dioxide (CO<sub>2</sub>)

- 73% of our GHG emissions.
- Global warming potential: 1 CO<sub>2</sub> eq.
- Origin: mainly emitted from:
  - 1 — Combustion of fossil fuels to generate energy to power our own and our customers' installations.
  - 2 — Treatment by incineration of waste from our municipal and industrial customers.

## Methane (CH<sub>4</sub>)

- 26% of our GHG emissions.
- Global warming potential: 28 CO<sub>2</sub> eq., i.e., 28 times greater than CO<sub>2</sub>.
- Origin: emitted from the decomposition of wet organic waste in landfill sites and wastewater treatment facilities.

## Nitrous oxide (N<sub>2</sub>O)

- 1% of our GHG emissions.
- Global warming potential: 298 CO<sub>2</sub> eq., i.e., 298 times greater than CO<sub>2</sub>.
- Origin: emitted from wastewater treatment.

# ... IN OPERATING SERVICES ESSENTIAL TO HUMAN ACTIVITY

and implementing numerous decarbonization solutions on behalf of our customers.

## We provide services essential to human activity

- By treating water to make it drinkable or depolluting it before returning it to the natural environment, Veolia provides a service that is essential to human activity while preserving biodiversity.
- Energy recovery of waste plays a key role environmentally by reducing the volume of waste in landfill and treating certain highly toxic pollutants, as well as organic waste that would produce methane if sent directly to a landfill site. In many countries, more recent environmental regulations tend to prioritize incineration over landfill. Despite these environmental benefits, incineration does generate significant GHG emissions.

- Keeping waste in landfill sites avoids contamination of groundwater tables. These installations have a vital positive impact in environmental, health and social terms. However, in some countries, the lack of sorting and of incinerators and composting streams means that considerable volumes of organic waste are consigned to landfill sites and consequently emit large quantities of methane.

## We implement numerous decarbonizing solutions for our customers and users

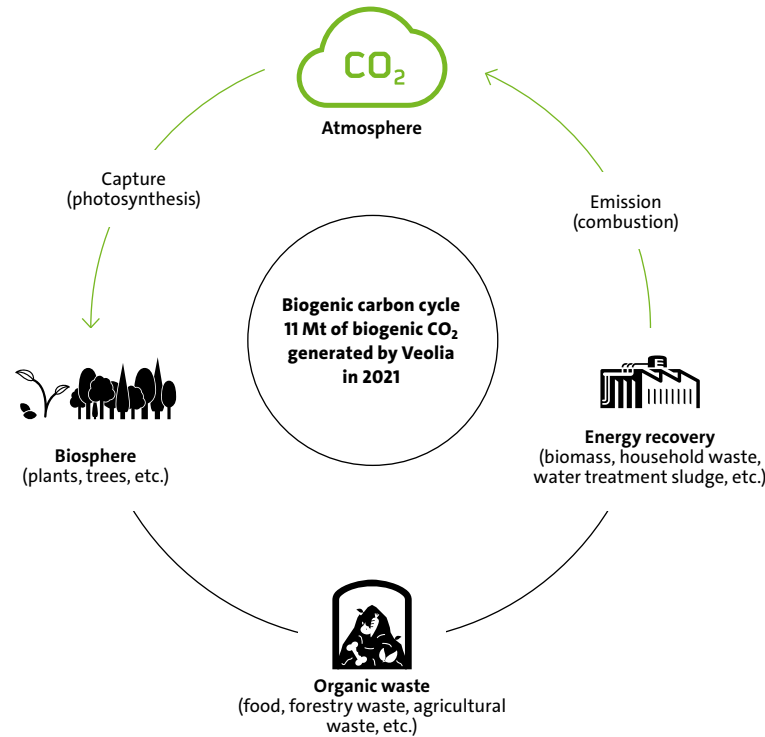
- Plastic recycling reduces the use of fossil materials to manufacture virgin plastic.
- Production/recovery of lower-carbon alternative fuels, such as biomass, biogas, solid recovered fuels (SRF) and heat recovered from waste incineration,

- are replacing more carbon-intensive fuels such as coal or fuel oil.
- Energy services for buildings or industrial facilities contribute to reducing our customers' energy consumption and to the rollout of renewable or low-carbon energies, and, ultimately, reduce our partners' emissions.
- Heat networks operated by the Group distribute heat to private users and industry more sustainably than individual systems in the long term. They make it possible to install more virtuous and generally more "decarbonizable" heating systems, since energy consumption is concentrated in fewer installations. By working to decarbonize and renovate these, Veolia also makes them greener in the short term.

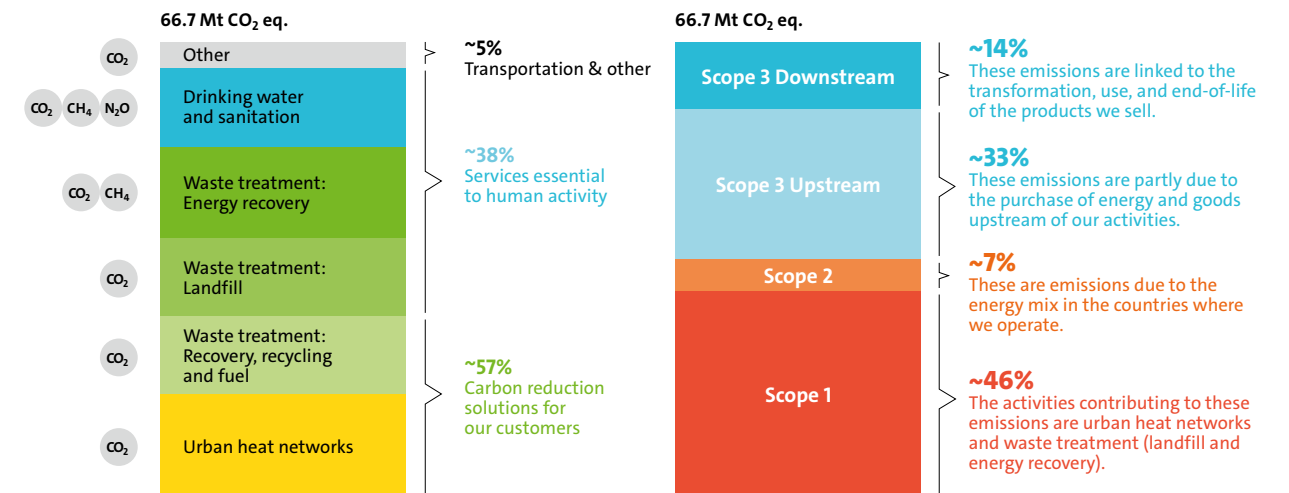
## FOCUS

### ON BIOGENIC CARBON

Only CO<sub>2</sub> from fossil sources is counted in our carbon balance (e.g. incinerated non-recyclable plastics), and not so-called "biogenic" CO<sub>2</sub> from organic sources (e.g. food waste), which is accounted for separately. Biogenic carbon emissions come from organic materials that had previously captured CO<sub>2</sub> present in the atmosphere, for example by photosynthesis. They are part of a short cycle (less than 100 years) that is considered carbon neutral. Conversely, biogenic methane is included due to its warming potential (28 times greater than that of CO<sub>2</sub>).



## Carbon balance: Breakdown of Veolia's emissions by activity and by scope (1, 2 and 3) in 2021 pro forma<sup>(1)</sup>



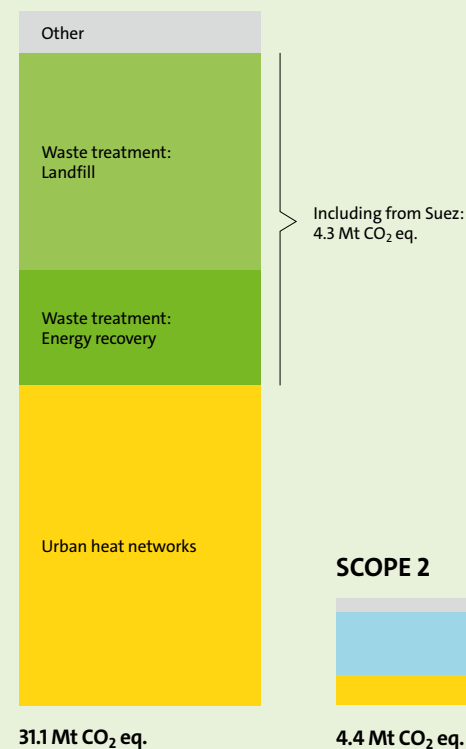
2021 is the baseline year for the Group's emissions reduction trajectory. In 2021, 57% of the Group's greenhouse gas emissions (scopes 1, 2 and 3) were produced from the recycling and recovery of waste and the operation of urban heat networks. By their nature, these activities have a carbon-reducing impact for our customers. The emissions inherent in these activities are also subject to reduction efforts. For the other services essential to human activity (38% of scopes 1, 2 and 3 emissions), the Group is also applying its expertise to reduce the associated emissions.

<sup>(1)</sup> The pro forma 2021 emissions presented here are the sum of Veolia's published emissions for 2021 and the 2021 emissions from the Suez businesses acquired and still held at the publication date of this document.

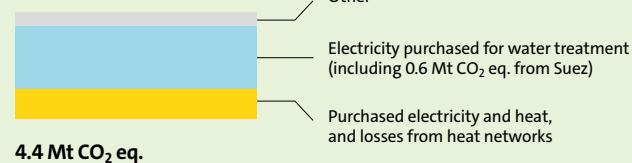
## SCOPES 1 AND 2: DIRECT EMISSIONS AND ENERGY CONSUMPTION

### Emissions 2021 pro forma<sup>(1)</sup>

#### SCOPE 1



#### SCOPE 2



The activities that contribute most to our direct scopes 1 and 2 emissions are those we perform for our municipal customers: urban heating, landfill, waste treatment, and energy recovery from waste.

- **Scope 1** (direct emissions) includes emissions directly generated by our activities: methane emissions from landfill sites and CO<sub>2</sub> emissions from waste-to-energy plants, power production plants, and truck fleets. Veolia's scope 1 incorporates emissions from our customers and users.
- **Scope 2** (indirect emissions) concerns the transformed energy that we use. It therefore depends on the energy mix in the countries where Veolia operates. In particular, it includes emissions linked to energy purchased for water treatment and thermal losses from heat networks.

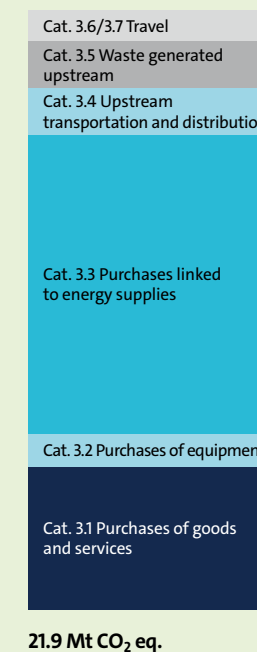
Veolia's scope 1 represents emissions from our activities: 31.1 Mt CO<sub>2</sub> eq. Scope 2 depends on energy purchased by the Group and stands at 4.4 Mt CO<sub>2</sub> eq.

<sup>(1)</sup> The pro forma 2021 emissions presented here are the sum of Veolia's published emissions for 2021 and the 2021 emissions from the Suez businesses acquired and still held at the publication date of this document.

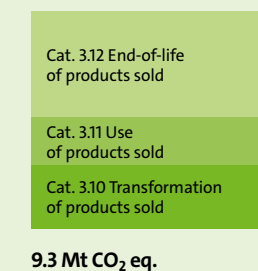
## SCOPE 3: INDIRECT EMISSIONS LINKED TO UPSTREAM AND DOWNSTREAM ACTIVITIES IN OUR VALUE CHAIN

### Emissions 2021 pro forma<sup>(1)</sup>

#### SCOPE 3 (Upstream by category)



#### SCOPE 3 (Downstream by category)



Part of our decarbonization effort materializes in our scope 3 downstream. Scope 3 represents almost half of our emissions. It can be divided into 2 parts:

- **Scope 3 Upstream** essentially comprises emissions linked to Veolia's purchasing: chemicals purchased for water treatment and fuels purchased for heat production.
- **Scope 3 Downstream** combines emissions linked to the transformation, use and end-of-life of products sold by the Group: sorted or recycled secondary materials; distributed heat, gas and electricity.

For most elements (85%) of scope 3 Upstream, the calculations are made by applying physical emissions factors to the quantities purchased. The rest (15%) – based on monetary emissions factors – will shrink thanks to the engagement program for Veolia's suppliers, which includes refining their emissions calculations.

Rigorous accounting of scope 3 emissions enables us to highlight our carbon reduction efforts. As the leader in an ecosystem, Veolia is involving all stakeholders – customers and suppliers alike – in this approach, in which everyone has clearly defined responsibilities for decarbonizing value chains.

Scope 3 incorporates indirect emissions linked to activities upstream (21.9 Mt CO<sub>2</sub> eq.) and downstream (9.3 Mt CO<sub>2</sub> eq.) in the value chain.

<sup>(1)</sup> The pro forma 2021 emissions presented here are the sum of Veolia's published emissions for 2021 and the 2021 emissions from the Suez businesses acquired and still held at the publication date of this document.

# OUR ACTIVITIES

To contribute to the fight against climate change, we are rolling out numerous carbon reduction solutions. Here, we take a closer look at our activities: heat networks, landfill sites, energy recovery plants, and hazardous waste treatment.

## FOCUS

### ON HEAT NETWORKS

Essential infrastructure more virtuous than individual systems and able to incorporate renewable energies

The transition of our heat networks to low-carbon energy began in 2018 and continues apace. We are committed to the decarbonization of our heat networks with short- and long-term strategies that range from improving energy efficiency to eventually adopting low-carbon energy sources.

#### How does this work?

These systems for distributing centrally produced heat provide heating and hot water to groups of buildings or entire districts. They include one or more heat

production units and a distribution network to transport the heat to people's homes.

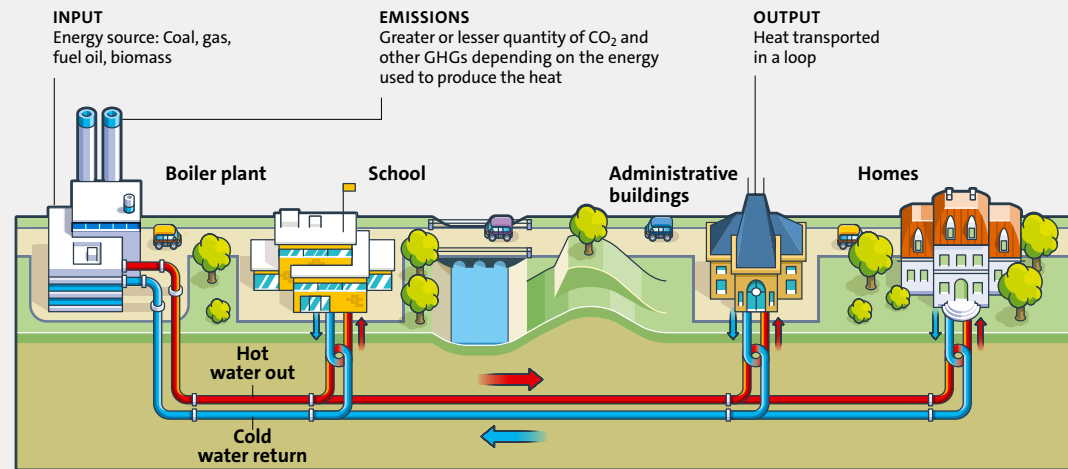
#### The environmental impact positive or negative?

- ⊕ Recovery of residual or waste heat from local sources (energy recovery plant, wastewater treatment plant, etc.) for more considered energy use.
- ⊕ Reduced GHG emissions when running on gas or renewable energies.
- ⊖ Potentially heavy emitters for their size depending on maintenance levels and the fuel used:
  - Coal: 0.4 t CO<sub>2</sub> eq./MWh
  - Natural gas: 0.2 t CO<sub>2</sub> eq./MWh
  - Biomass (the CO<sub>2</sub> is biogenic and not counted in scopes 1 and 2).

#### Reducing the carbon impact of heat networks

We decarbonize heat networks:

- In the short term: through improvements to networks, energy efficiency, and phasing out coal (in favor of natural gas, biomass, heat pumps, etc.).
- Over the long term: by rolling out 4<sup>th</sup>- and 5<sup>th</sup>-generation heat networks that replace natural gas with a low-carbon energy mix (electrification, geothermal, biogas, etc.) and CO<sub>2</sub> capture solutions for any residual emissions.



## FOCUS

### ON OUR LANDFILL SITES FOR NON-RECYCLABLE WASTE

These installations emit large quantities of methane, but we are finding ways to decarbonize them

As an essential alternative to uncontrolled dumping of non-recyclable waste our landfill sites play a crucial role in protecting the environment and public health, despite the challenges presented by methane emissions. These installations represent a fundamental step toward more sustainable waste management, and the door is open to innovations that will reduce their carbon impact.

#### How does this work?

Landfill sites contain multiple cells – holes excavated in the soil and lined with a thick geomembrane to isolate them from the surrounding land.

This infrastructure is the first vital stage in creating an effective waste management stream, taking the place of unregulated dumping, which can cause pollution and serious health problems. And effective waste management streams still also use landfill sites for final waste. However, landfill sites can emit large quantities of methane, depending on the quantity of organic waste deposited in them. These facilities therefore represent an initial phase in environmental management, but must be supplemented by incineration and sorting/reclamation streams for organic waste – core business areas for Veolia.

#### The environmental impact positive or negative?

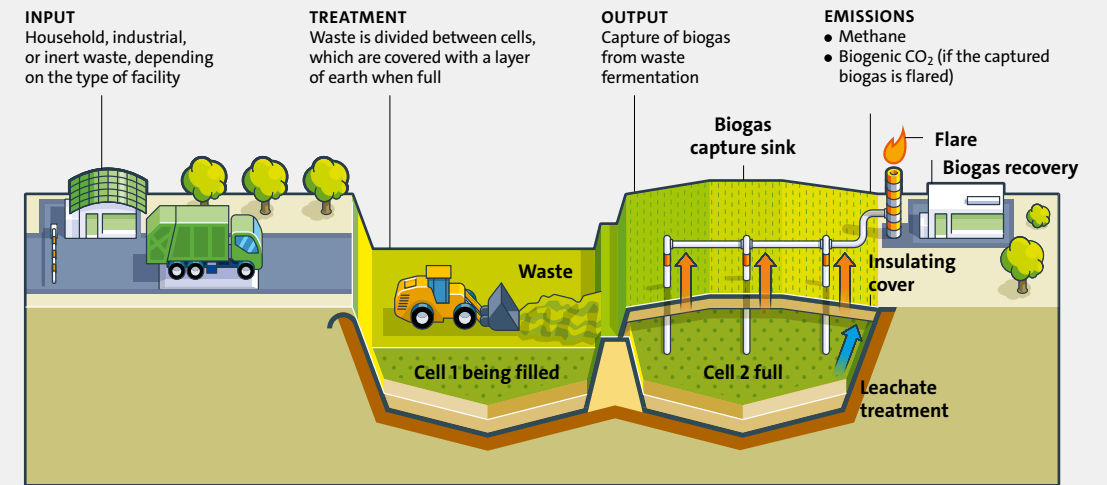
- ⊕ Better than unregulated dumping.

- ⊕ Protect soil, watercourses, and groundwater tables.
- ⊕ Positive social and health impact for nearby communities.
- ⊖ Greenhouse effect: methane emissions if not captured at source.
- ⊖ Between 0.2 and 0.8 t CO<sub>2</sub> eq. per ton of waste buried in the short term, but long-term, this indicator reduces in line with the shrinking quantity of decomposing waste.

#### Reducing the carbon impact of landfill sites

To decarbonize these sites, we plan to:

- Capture methane and produce biogas.
- Reuse these sites for solar panel installations.





### ON OUR ENERGY RECOVERY UNITS FOR NON-RECYCLABLE WASTE

#### Installations that offer important environmental benefits for non-recyclable waste management.

Energy recovery from waste plays a key role in our waste management strategy. It transforms non-recyclable waste into energy in full compliance with strict legislation on treating emissions from combustion. This approach considerably reduces the volume of waste sent to landfill and contributes to energy production, although the GHG emissions produced from the residual unsorted plastics in household waste remain an issue.

#### How does this work?

European legislation has set a target for 2035 of just 10% of waste sent to landfill. Along with recycling, therefore, incineration is an essential part of the waste treatment stream.

It consists in incinerating the non-recyclable part of municipal waste at temperatures ranging from 800 to 1,000 °C. Incinerators are equipped with sophisticated flue gas treatment systems to ensure compliance with the strict legislation on polluting emissions, such as dioxins. Most current incinerators are able to produce energy by recovering the heat emitted when waste is burned.

#### The environmental impact positive or negative?

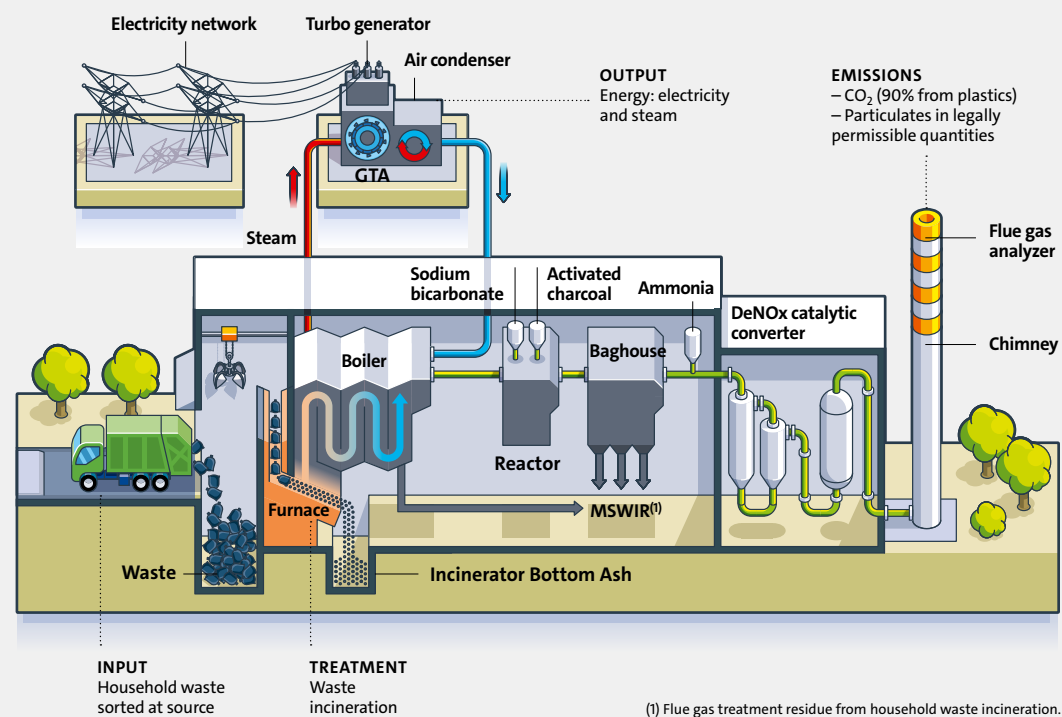
- ⊕ 90% reduction in the volume of waste sent to landfill.
- ⊕ Destruction of organic waste, which, if not incinerated, would emit methane as it decomposed.
- ⊕ Capture of harmful pollutants in the incineration ash.
- ⊕ Cogeneration of heat and electricity to replace fossil-fuel generation.

- ⊖ Significant emissions of GHGs and other atmospheric pollutants.
- ⊖ 0.4 t CO<sub>2</sub> eq. per ton of waste incinerated, due to the plastic content in household waste (plastic is the source of 90% of the emissions from incinerating household waste).

#### Reducing the carbon impact of energy recovery units

We are using incineration to decarbonize:

- In the short term: by improving plastics sorting and recycling to remove them from the incineration stream.
- Over the long term: with CO<sub>2</sub> capture to transform incinerators into carbon sinks using Carbon Capture & Storage (CCS) or by reclaiming carbon through Carbon Capture & Utilization (CCU) to avoid resorting to the extraction of fossil energy for fuel production.



### ON THE TREATMENT OF HAZARDOUS WASTE

#### Solutions governed by regulations and essential for protecting human health and the environment.

#### How does this work?

Some waste can be toxic or harmful to human health or the environment. Strict legislation and traceability standards apply to this type of waste. For hazardous waste that cannot be consigned to landfill or physico-chemically or biologically treated, incineration is a reliable and effective solution for destroying pollutants. The waste is oxidized by being incinerated at temperatures ranging from 850 to 1,100 °C. These installations are designed, equipped and operated to ensure compliance with the strict

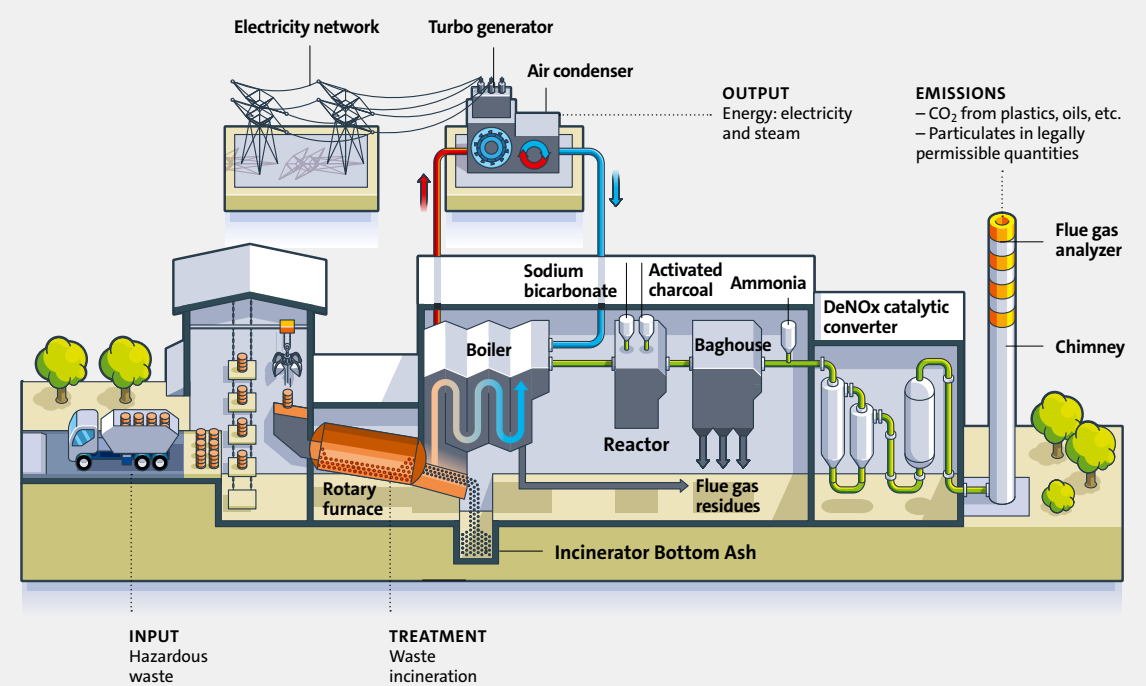
legislations on polluting emissions. Increasingly, installations can also recover the energy produced.

#### The environmental impact positive or negative?

- ⊕ Safe and secure treatment of hazardous waste for which there are no alternatives.
- ⊕ Better than unregulated dumping.
- ⊕ Protects soil, watercourses, and groundwater tables.
- ⊕ Positive social and health impact for nearby communities.
- ⊕ Cogeneration of heat and electricity to replace fossil-fuel generation.
- ⊖ Significant emissions of GHGs and other atmospheric pollutants.
- ⊖ 0.78 t CO<sub>2</sub> eq. on average per ton of waste incinerated, produced from the waste's fossil carbon content.

#### Reducing the carbon impact of hazardous waste incineration

- In the short term: through thermal optimization of furnaces by injecting preheated air.
- In the short/medium term: by removing plastic hazardous waste containers and some liquid waste with high lower heating values (LHVs).
- Over the long term: through CO<sub>2</sub> capture and utilization to transform incinerators into carbon sinks using CCS, or carbon utilization through CCU to reduce the need to extract fossil energy to make fuel.



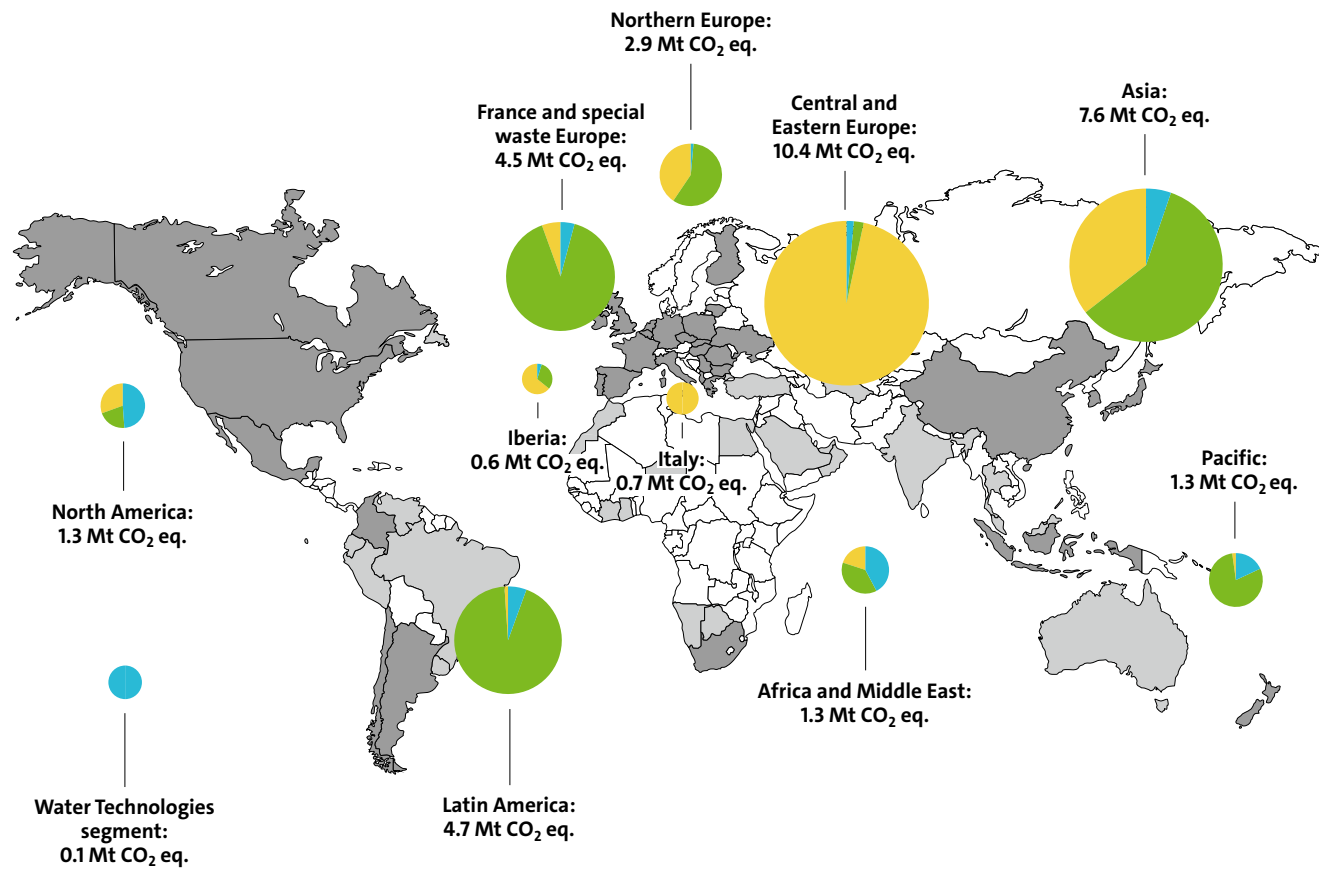


# OUR REGIONS

Our emissions show significant variations in our main regions of operation, depending on the business types in these regions. They are predominantly produced in Europe, Latin America, and Asia.

## Distribution of our worldwide emissions by activity

(Scopes 1 and 2, 2021 pro forma<sup>(1)</sup>)



Veolia's scopes 1 and 2 emissions are mainly spread over 4 geographical zones. France and special waste in Europe generate 4.5 Mt CO<sub>2</sub> eq. Central and eastern Europe account for 10.4 Mt CO<sub>2</sub> eq., ahead of Asia (7.6 Mt CO<sub>2</sub> eq.) and Latin America (4.7 Mt CO<sub>2</sub> eq.).

● Water ● Waste ● Energy  
 ● Veolia country ● Veolia country with CO<sub>2</sub> market

### Regional carbon prices

EU: ~€80/t CO<sub>2</sub> eq.  
 US: ~€25/t CO<sub>2</sub> eq.  
 China: <€10/t CO<sub>2</sub> eq.

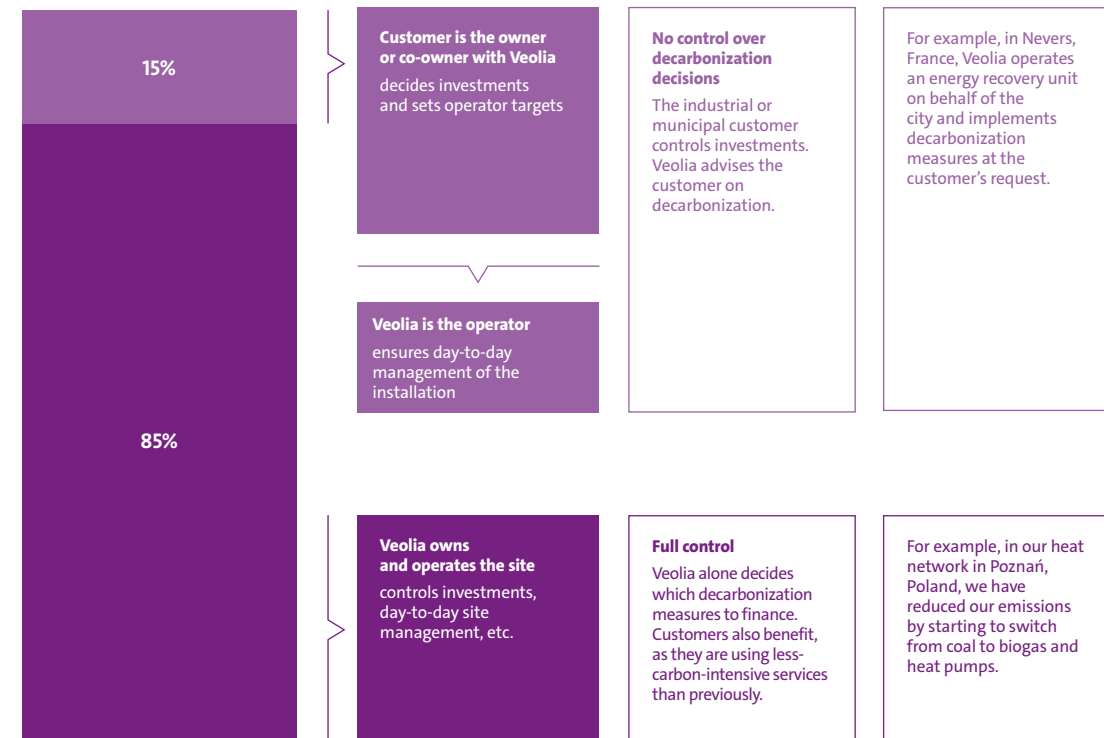
## A CARBON BALANCE IMPACTED BY OUR CUSTOMERS' EMISSIONS

In addition to the assets that Veolia owns, it operates installations belonging to its customers and counts their emissions in its own carbon balance. To decarbonize these sites, Veolia is consulting with its customers, who of course have the final say. After decarbonization plans are implemented, the residual CO<sub>2</sub> remains in our carbon balance until the end of the contract. Consequently, the more assets the Group decarbonizes, the larger its own carbon balance becomes, even though atmospheric emissions are reduced overall. We take the GHG Protocol operational control approach to reporting our emissions.



## Distribution of the 35.5 Mt CO<sub>2</sub> eq. scopes 1 and 2 emissions by Veolia control level<sup>(1)</sup>

Veolia's scopes 1 and 2 emissions are 85% linked to sites where Veolia has full control as owner and operator. The remaining 15% of emissions come from sites where Veolia operates but does not have full decision-making control.



<sup>(1)</sup> The pro forma 2021 emissions presented here are the sum of Veolia's published emissions for 2021 and the 2021 emissions from the Suez businesses acquired and still held at the publication date of this document.

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# DECARBONIZING

## OUR CUSTOMERS' TRAJECTORIES

In line with our climate targets, decarbonizing our customers' businesses is a central component of our approach. For more than 10 years, we have been implementing innovative and sustainable solutions designed to shrink our carbon footprint.





# CONSOLIDATING DECARBONIZATION EFFORTS: ACKNOWLEDGING SCOPE 4

Scope 4 is an appropriate way to account for decarbonization efforts, corresponding to the reductions in emissions brought about by an organization's activities, products or services when these reductions occur outside the scope of its own business.

## SCOPE 4: AN IMPERATIVE FOR ACCELERATING THE DECARBONIZATION OF BUSINESSES

\_\_\_\_\_ The more customers the Group has, the higher its emissions. When Veolia operates in factories owned by its customers, their carbon emissions are included in Veolia's carbon footprint. Paradoxically, companies working to decarbonize polluting activities, such as Veolia, are caught at a disadvantage. Their emissions reduction pathways lag behind those of other businesses – particularly companies that sell their highest-emitting activities without even

trying to transform them. We are calling for recognition of Scope 4. By factoring in the emissions avoided by Veolia within its own scope of operations as well as the scope of its customers, this shift would give fair consideration to decarbonization efforts. By measuring these efforts, we can encourage actors with the most capabilities to lead the ecological transformation to take on their role. It is about urging companies to reduce the most difficult emissions. Given this context, Scope 4 is a relevant concept that highlights the positive impact of our decarbonization actions and acts as an accurate indicator of the ecological transformation.

## SCOPE 4: CALCULATION METHOD

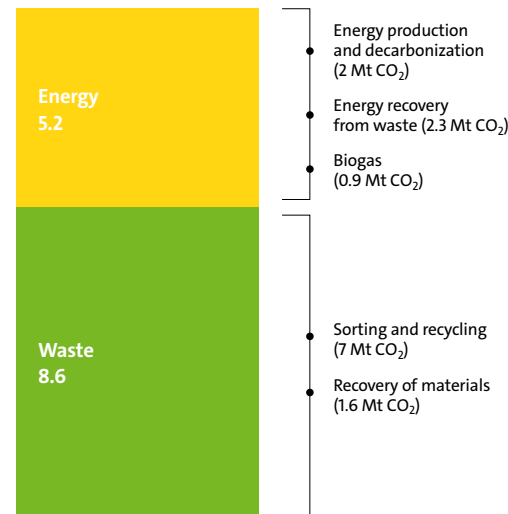
Veolia's scope 4 quantifies the CO<sub>2</sub> that would have been emitted into the atmosphere if not for the decarbonization solutions the Group has implemented. The method we have been using since 2013 is guided by current reference methodology, and this indicator is externally audited by KPMG. For the calculations, a physical measure (tonnage, MWh, etc.) is multiplied by an avoidance factor. The latter is calculated using a baseline scenario for each country.

## EXAMPLES

**Energy**  
**Veolia supplies heat and electricity produced using renewable or low-carbon energies.** For example, the Group offers biogas solutions and energy recovery from waste in countries with a carbon-intensive energy mix. Veolia is thereby facilitating the avoidance of emissions that would have been generated from the fossil fuels used to produce the same quantity of electricity or heat.

**Waste**  
**Sorting and recycling plastics is another activity that avoids GHG emissions by our customers.** Every ton of plastic recycled avoids 1.1 tons of CO<sub>2</sub> by reducing the need for virgin plastic produced from extracted oil.

## SCOPE 4



2023 – 13.8 Mt CO<sub>2</sub><sup>(1)(2)</sup>

(1) In 2023, Veolia changed its methodology to better align with WBCSD best practice. This new methodology led the Group to review its Scope 4 emissions in 2023, which have dropped from 15.5 Mt CO<sub>2</sub> eq., according to the old method, to 13.8 Mt CO<sub>2</sub> eq., with the new method. The emissions reported in the Impact 20–23 strategic plan were calculated using the old method. The new methodology applies to the GreenUp plan from 2024.

(2) Provisional figure at time of publication. The final figure will be published in Veolia's 2023 URD.



## HELPING OUR CUSTOMERS REDUCE THEIR EMISSIONS

\_\_\_\_\_ We are developing standout solutions in the energy, water and waste sectors to help our customers reduce their greenhouse gas emissions.



## Replacing coal with waste energy recovery

In Lille and Roubaix, France, we operate a "heat super highway." The heat network has been extended by 20 km to reach the energy recovery plant. Waste is now transformed into heat and electricity.

- 35,000 homes supplied with heat, and 20,000 homes with electricity.
- Veolia's carbon balance: 123 kt CO<sub>2</sub> eq. annual increase (scope 1).
- Veolia's commitment to decarbonization: 50 kt CO<sub>2</sub> eq. annual reduction (scope 4).

## Heating pools with energy from the sanitation network

At the "Cercle des nageurs" swim club in Marseille, France, Veolia transfers heat from the sanitation network to the water in the pools using a heat exchanger and heat pumps.

- 50% energy saving.
- Veolia's carbon balance: 3,000 t CO<sub>2</sub> eq. annual increase (scope 1).
- Veolia's commitment to decarbonization: 230 t CO<sub>2</sub> eq. annual reduction (scope 4).



## Replacing coal with solid recovered fuel made from non-recyclable waste to cogenerate heat and electricity

At the Solvay chemical plant in Dombasle, France, we are to produce heat and electricity from treated non-recyclable waste, known as solid recovered fuel (SRF). This solution is a substitute for coal and can be replicated at other chemical plants that use coal.

- Guaranteed supply, performance, and compliance of fuel.
- 100% of fuel supplied by our Waste Recycling & Recovery division (350,000 metric tons a year).
- Combustion waste treatment for 10 years.
- Veolia's carbon balance: 250 kt CO<sub>2</sub> eq. annual increase for Veolia (scope 1).
- Veolia's commitment to decarbonization: 250 kt CO<sub>2</sub> eq. annual reduction, i.e., 25% of Solvay's annual CO<sub>2</sub> reduction target (scope 4).

# FOCUS

## SUPPORTING AUSTRALIA'S ENVIRONMENTAL TRANSITION

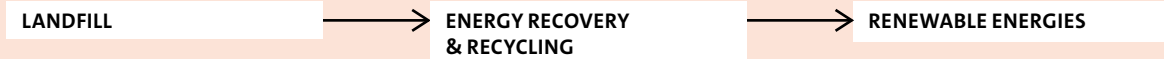
In Australia, we are accelerating support for our customers in their environmental transition by rolling out custom decarbonization solutions.

Australia has undertaken a major environmental transition during the past 3 years, which seems irreversible. The nation wants to valorise its waste rather than landfill it, thus transforming

its highly carbonated energy mix, which is still based on significant local resources of coal and gas.

Despite the positive impact on Australia's overall carbon balance, our internal carbon balance will take on more scope 1 from assets to decarbonise other sectors (our customers) but which themselves incur a carbon cost. Indeed, energy from waste involves inherent

emissions (630 kt CO<sub>2</sub> eq./year), but saves more elsewhere in the economy. The net balance of this development is highly attractive however current carbon accountability requires amendment to reflect the global reality. This example among others clearly indicates that taking into account downstream benefits within a scope 4 is essential to make sure we spend our capital well to manage climate change.



### Methane capture

- Target: 75% of methane captured by 2032 (currently 65%).
- Decarbonization: 200 kt CO<sub>2</sub> eq. reduction in emissions (scope 1).



### Energy recovery

- Target: a less carbon-intensive local mix and investment in recycling.
- CO<sub>2</sub> impact of energy recovery from non-recyclable waste:
  - Scope 1: 630 kt CO<sub>2</sub> eq. a year
  - Scope 4: 340 kt CO<sub>2</sub> eq. a year



### Solar and wind installations

- Target: 450 MW to completely eliminate scope 2 and sell green electricity to industry.
- Decarbonization: 800 kt CO<sub>2</sub> a year reduction including 650 kt CO<sub>2</sub> eq. a year for scope 4.



In Australia, Veolia is transforming waste management to move from landfill to incineration and the production of renewable energy.

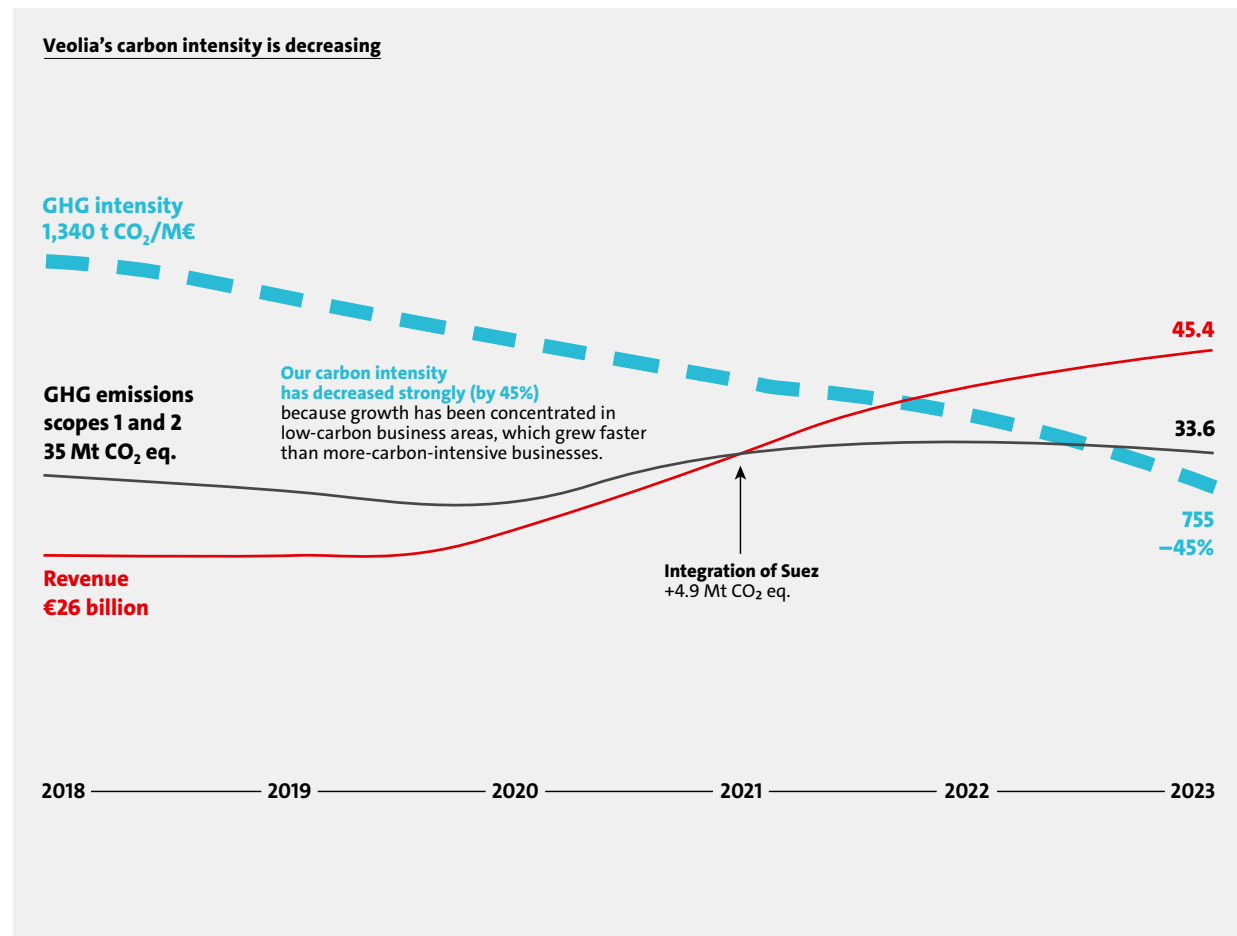


# REDUCING OUR CARBON INTENSITY

Since 2018, thanks to our decarbonization efforts, we have successfully reduced the carbon intensity of our business by 45% for scopes 1 and 2 by taking action in every business area.

Our carbon intensity has continuously fallen since 2018, including after the integration of Suez businesses (which added 4.9 Mt CO<sub>2</sub> eq. in 2021).

This reduction is the result of strategic choices for growth and decarbonization action, including the plan to phase out coal in eastern Europe.



## DECARBONIZATION SOLUTIONS TAILORED TO LOCAL REALITIES

Our approach is embodied in all the projects launched with the aim of reducing our own carbon balance in every part of the world.

### UNITED STATES

#### Key Veolia actions:

- Energy efficiency, long-term renewable energy contracts (PPAs), operational optimization, etc.
- E.g. replacement of a coal-powered furnace by highly efficient gas-powered cogeneration at the DuPont plant in Virginia.

### EUROPE

#### Key Veolia actions:

- Eastern Europe: phasing out coal by 2030 (emissions reduced by 3.6 Mt CO<sub>2</sub> eq.; €1.6 billion in investment).
- Waste: optimized methane capture; photovoltaic solar; development of carbon capture in Marchwood, UK.

### ASIA

#### Key Veolia actions:

- Waste: methane capture plan – approx. 450 kt CO<sub>2</sub> annual reduction by 2027 (Hong Kong).



### LATIN AMERICA

#### Key Veolia actions:

- Landfill sites methane capture plan: target of 70% by 2027, for a 1.5 Mt CO<sub>2</sub> eq. reduction.

### AFRICA & MIDDLE EAST

#### Key Veolia actions:

- Construction of desalination plants powered by renewable energy – projects won: Oman Sur (30% renewables; 300 kt CO<sub>2</sub> avoided).

### AUSTRALIA

#### Key Veolia actions:

- Methane capture plan with an average target capture rate of 75% for landfills.

**PHASING OUT COAL IN EUROPE BY 2030**

Some years ago, in line with our decarbonization strategy, we launched a massive program to modify our urban heat installations in Europe to eliminate the use of coal as fuel.

€1.6 billion: the amount Veolia will have invested between 2018 and 2030 to phase out coal in eastern Europe. These investments affect 9 factories, 5 of which will have completed their transitions by 2026. This will allow a 3.65 Mt CO<sub>2</sub> eq. reduction in the Group's carbon balance by replacing the coal with a lower-carbon mix using gas, biomass, and heat pumps.



The 9 sites involved in the coal phase-out plan (investments by 2027)

**POLAND**

**POZNAŃ**

- Total invested: €240 million
- Coal phase-out (stage 1): 2024

**ŁÓDŹ**

- Total invested: €287 million
- Coal phase-out (stage 1): 2026

**GERMANY**

**BRAUNSCHWEIG**

- Total invested: €110 million
- Coal phase-out: 2023

**CZECH REP.**

**KOLÍN**

- Total invested: €10 million
- Coal phase-out: 2023

**PŘEROV**

- Total invested: €55 million
- Coal phase-out: 2023

**FRÝDEK-MÍSTEK I.**

- Total invested: €8.3 million
- Coal phase-out: 2024

**KARVINÁ I.**

- Total invested: €17.2 million
- Coal phase-out: 2024

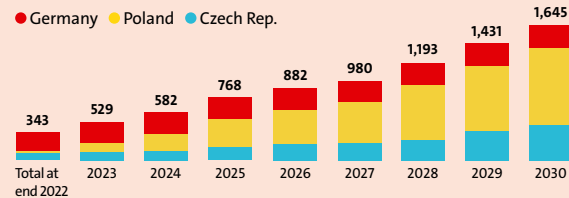
**OSTRAVA**

- Total invested: €300 million
- Coal phase-out: 2027

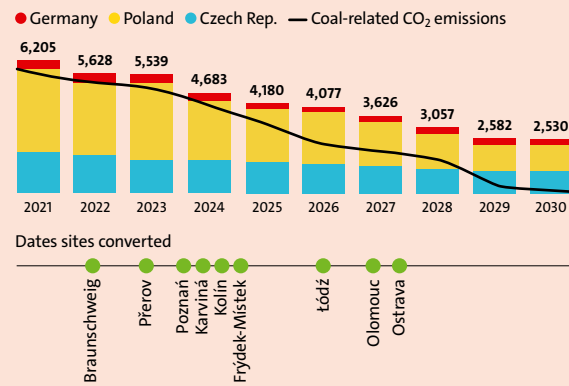
**OLOMOUC**

- Total invested: €80 million
- Coal phase-out: 2027

**Total net investment by 2030 (millions of euros)**



**CO<sub>2</sub> emissions trajectory (thousands of metric tons)**



To support its downward trajectory in CO<sub>2</sub> emissions, Veolia plans to invest €1.645 billion in converting its installations to lower-carbon energies by 2030.

**Phasing out coal in Europe**

Progress in our plan to phase out coal Over €529 million has been invested as of 2023, with a further €515 million planned for 2024-2027. The expected reductions in emissions are as follows:

- 250 kt CO<sub>2</sub> in Germany
  - 900 kt CO<sub>2</sub> in the Czech Republic
  - 2,500 kt CO<sub>2</sub> in Poland
- Projects in Braunschweig (Germany), and Přerov and Kolín (Czech Rep.) are completed. Poznań (Poland) is the next site due for conversion, with work scheduled to begin in November 2024. These projects have an IRR (internal rate of return) of over 10%.



**REDUCING EMISSIONS FROM HEAT NETWORKS IN CHINA**

Heat networks provide an essential service, especially to populations in regions of intense winter cold, such as North China. Decarbonizing these heat networks is a genuine challenge, due to China's dependency on coal. Veolia has no plans to sell off its polluting assets

in the country. Rather, our mission is to ensure their transformation and decarbonization. To achieve this, we are activating every available lever for decarbonization, particularly in Harbin, where Veolia operates its largest heat network in China. For the time being, this network cannot rely on any fuel other than coal, given coal's importance in China's energy strategy and in the country's energy mix. Despite these obstacles, Veolia

has already improved the network's carbon intensity, reducing it by 30% between 2012 and 2024. The Group is also implementing an emissions reduction program for the site, with the aim of reducing its CO<sub>2</sub> emissions by 35% by 2032. The Group is using several levers: partial fuel substitution, alternative heat sources (cogeneration), and in-situ heat recovery solutions.



**F O C U S**

**WASTE**

**METHANE CAPTURE**

**To reduce our emissions in the waste sector, we are rolling out an ambitious methane capture plan in every region in which we operate.**

On a 100-year scale, methane is a greenhouse gas with a warming potential 28 times greater than that of CO<sub>2</sub>. Capturing it is therefore an effective lever for rapidly and massively reducing emissions from Veolia-operated landfill sites. In Latin America, the Group made it a priority to implement a dedicated methane capture plan. This zone contains 18 high-emitter landfill sites

(responsible for 57% of the total carbon emissions from Group landfill facilities in 2021). As part of GreenUp – our strategic program 2027, the whole Group is embracing methane capture. Each geographical zone is targeting capture rates at the highest possible performance levels, which vary according to local climate conditions (heat and humidity) and the moisture content of the waste received. The aim is to achieve an overall methane capture rate of 80% (currently 57%) by 2032, a reduction of around 5 Mt CO<sub>2</sub> eq. compared with 2021. In practical terms, methane emissions are measured using

on-site sensors, satellite data, and calculations based on the waste tonnage entering each site. The methane capture itself involves placing a covering of membrane, clay, and earth over filled cells. Areas currently in operation are gradually fitted with capture pipework as the cells are filled. The captured gas is then converted into energy (it is the main component in natural gas) or flared off, if it cannot be converted locally (with a significantly reduced impact compared with venting – the release of methane into the open air, which is absolutely to be avoided).

**Distribution by geographical zone of emissions from Group-operated landfill sites, with emissions reduction targets for 2032**

**United Kingdom**

Emissions reduction target: ~200 kt CO<sub>2</sub> eq.

**France**

Emissions reduction target: ~1,000 kt CO<sub>2</sub> eq.

**Latin America**

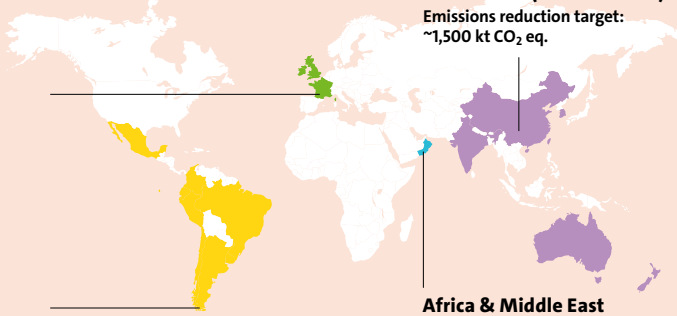
Emissions reduction target: ~2,000 kt CO<sub>2</sub> eq.

**Asia-Pacific (incl. Australia)**

Emissions reduction target: ~1,500 kt CO<sub>2</sub> eq.

**Africa & Middle East**

Emissions reduction target: ~300 kt CO<sub>2</sub> eq.



**Biogas capture at landfill sites**

Recovered biogas is transformed into electricity (12 MW – equivalent to the energy needs of a town with ~42,000 inhabitants) and into biomethane (3 sites since 2021), enabling the customer to decarbonize their business with 1.5 MT CO<sub>2</sub> avoided. Biogas emitted from landfill (Brazil)



**Energy recovery**

Waste treated to produce solid recovered fuel and biomethane (22,000 MWh) used in a cogeneration plant and injected into the public gas network. Rostock (Germany)

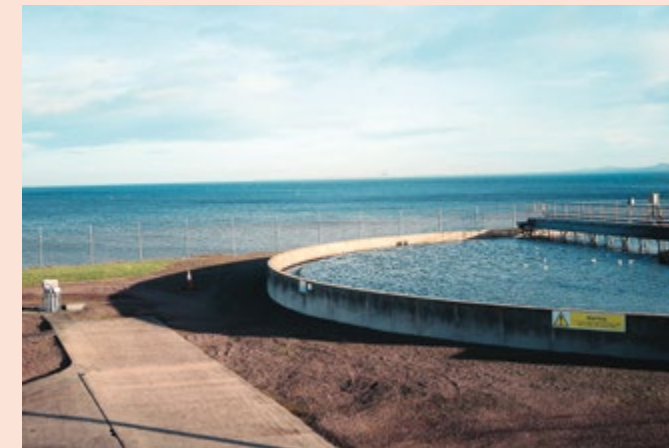


**F O C U S**

**WATER**

**OPTIMIZING TREATMENT PLANTS**

**We are committed to reducing our emissions linked to water treatment and are making use of every available lever: energy efficiency, solar energy, biomethane capture from wastewater, implementation of carbon-neutral desalination solutions, etc.**



**Main emissions reduction projects for Veolia water businesses**

**United States**

• Nassau waste water treatment plant: reduction and optimization of energy consumption

**Africa & Middle East**

• Desalination using solar energy: Sur (Oman, 300 kt CO<sub>2</sub> annual reduction)

**Latin America**

• Waste water treatment plant in Chile: 16% reduction in emissions (22 kt CO<sub>2</sub>) by reducing energy intensity by 10% over 10 years

**Asia-Pacific (incl. Australia)**

• Solar on drinking water plant in Tianjin (China): 1.6 MW, 1,500 kt CO<sub>2</sub> annual reduction

**Solar-powered desalination in Oman**

This solar project is the first of its type in the Middle East. It will produce more than 30 GWh (gigawatt hours) of green electricity a year, more than a third of the desalination plant's day-to-day requirements. Sur (Oman)



**Transforming waste and wastewater into biomethane**

Construction of France's largest facility for producing and injecting methane sourced from purification. The challenge is to purify the methane in order to reinject it into the public network. 9,000 t CO<sub>2</sub> eq. annual reduction. Valenton (France)





# ACCELERATING

## OUR DECARBONIZATION TRAJECTORY

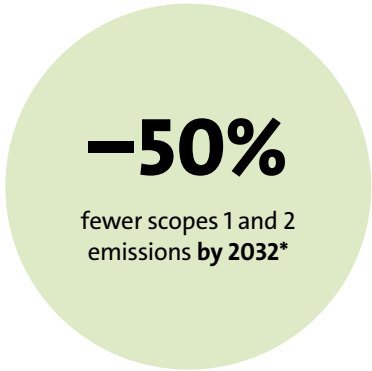
We are accelerating our decarbonization trajectory in order to reach Net Zero by 2050.





# OUR TRAJECTORY AND COMMITMENTS

We are committed to a trajectory of reducing our emissions. This trajectory is heading toward Net Zero (1.5 °C) with an accelerated deployment of decarbonization levers until 2032.



## OUR SBTi COMMITMENTS

The Group is committed to a 50% reduction in its scope 1 and 2 emissions and a 30% reduction across 67% of scope 3 by 2032 (compared with 2021).

In September 2021, Veolia signed the Science Based Targets initiative's Business Ambition for 1.5 °C. In December 2023, following a long period of working with all our business units, the Group submitted its application to be

listed for SBTi 1.5 °C and Net Zero. In July 2024, the SBTi validated Veolia's short-term emissions reduction target (-50% by 2032) and recorded the Group's commitment to reduce its long-term emissions to achieve net zero emissions by 2050.

To achieve the 50% reduction in scope 1 and 2 emissions by 2032, we are acting on several decarbonization levers:

- Phasing out coal in our Energy business (€1.6 billion invested between 2018 and 2030).

- Increasing methane capture rates at our landfill sites for non-recyclable waste.
- Sorting and removing more plastic from incinerator inputs for the Waste business.
- Improving energy efficiency across all business areas.
- Decarbonizing the energy mix in Veolia-operated heat networks.
- The Group also plans to use vehicles with lower greenhouse gas emissions (electric and hybrid engines, and lower-carbon fuels).

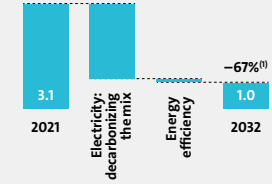
We are using specific levers suited to our businesses and economic sectors to ensure the success of our

decarbonization strategy. This targeted approach is essential to achieving our climate objectives.

## Emissions reduction levers by Group business area (scopes 1 and 2) (Mt CO<sub>2</sub>)

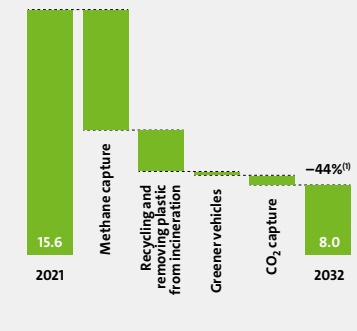
### WATER

- **Using electricity from renewable sources:** recovering energy from wastewater treatment sludge; self-consumption; purchasing renewable electricity.
- **Energy efficiency.**



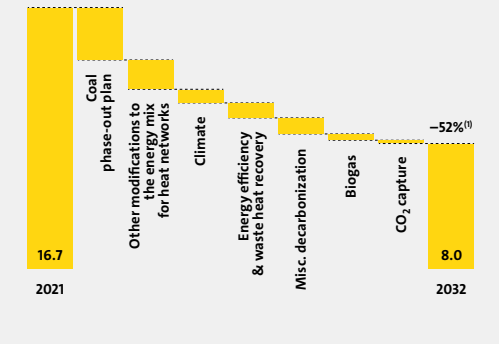
### WASTE

- **Methane capture at landfill sites:** €250 million Capex invested between 2020 and 2032.
- **Less plastic incinerated.**
- **Decarbonizing vehicles.**
- **Trialing CO<sub>2</sub> capture at source.**



### ENERGY

- **Coal phase-out plan** through less-emitting fuels (biomass, gas, and solid recovered fuel – SRF): €1.6 billion in investment spending (Capex) between 2018 and 2030.
- **Improved energy mix** in networks (heat pumps, biogas).
- **Energy efficiency** in networks.

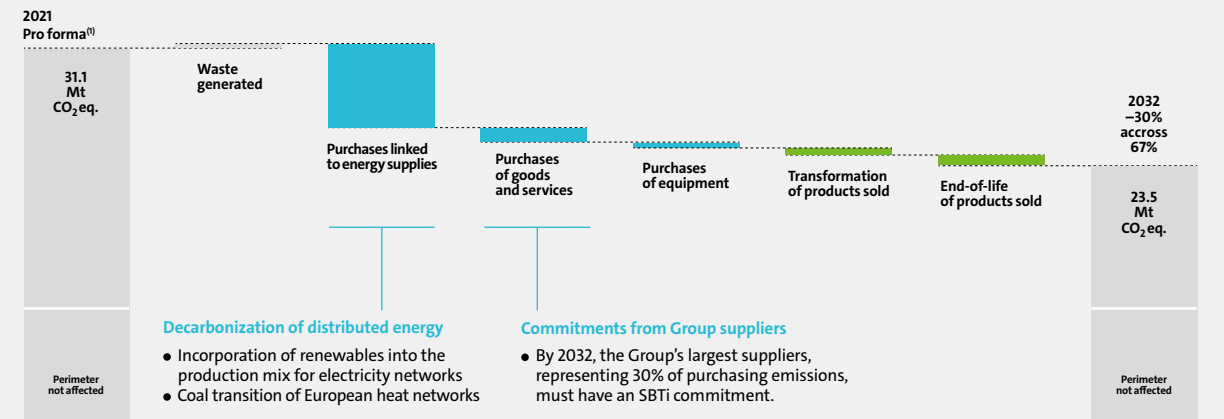


(1) Based on 2021 perimeter. GHG scopes 1 and 2, 2021 pro forma. Source: IEA Net Zero scenario, Veolia analysis.

(1) The pro forma 2021 emissions presented here are the sum of Veolia's published emissions for 2021 and the 2021 emissions from the Suez businesses acquired and still held at the publication date of this document.

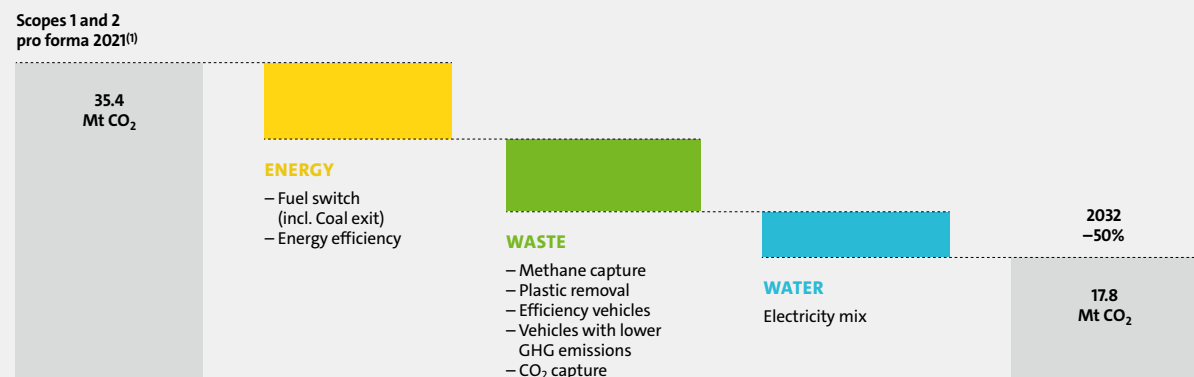
Veolia is committed to reducing emissions by 30% across 67% of its scope 3 by 2032, in line with the SBTi 1.5 °C standard.

## Veolia's scope 3 reduction levers



(1) The pro forma 2021 emissions presented here are the sum of Veolia's published emissions for 2021 and the 2021 emissions from the Suez businesses acquired and still held at the publication date of this document.

## Reduction levers to be implemented to halve the Group's scopes 1 and 2 emissions by 2032 (compared with 2021)

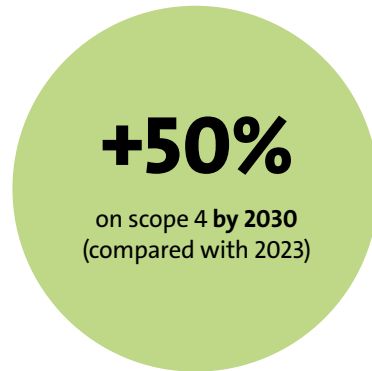


(1) The pro forma 2021 emissions presented here are the sum of Veolia's published emissions for 2021 and the 2021 emissions from the Suez businesses acquired and still held at the publication date of this document.



# DECARBONIZING FURTHER THROUGH SCOPE 4

We are working to decarbonize our customers' activities (scope 4).  
 We have set the ambitious target of increasing our scope 4 by 50% by 2030 (compared with 2023).

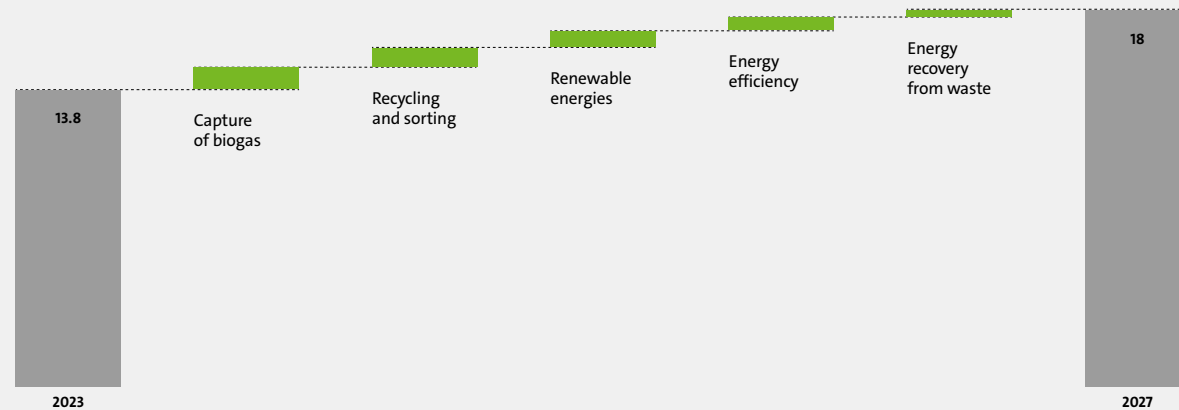


As stated in the second part of this Climate Report, Veolia advocates the use of a “scope 4” in ESG scoring criteria. Adding this scope to the carbon balance would make it possible to assess a company’s full impact on the climate. This indicator would illustrate the “before” and “after” of a company’s actions and better measure the ecological and

economic benefits created. We hope to see strong growth in our scope 4 due to our activities by 2027, in line with the “decarbonization” pillar of our strategic program. The flagship action points in this program are: biogas capture and utilization, waste recycling, use of renewable energies, energy efficiency, and energy recovery from waste.



Veolia's scope 4 trajectory



With the help of our waste and energy businesses, we aim to increase our scope 4 by 13.8 Mt CO<sub>2</sub> eq. to 18 Mt CO<sub>2</sub> eq. by 2027.

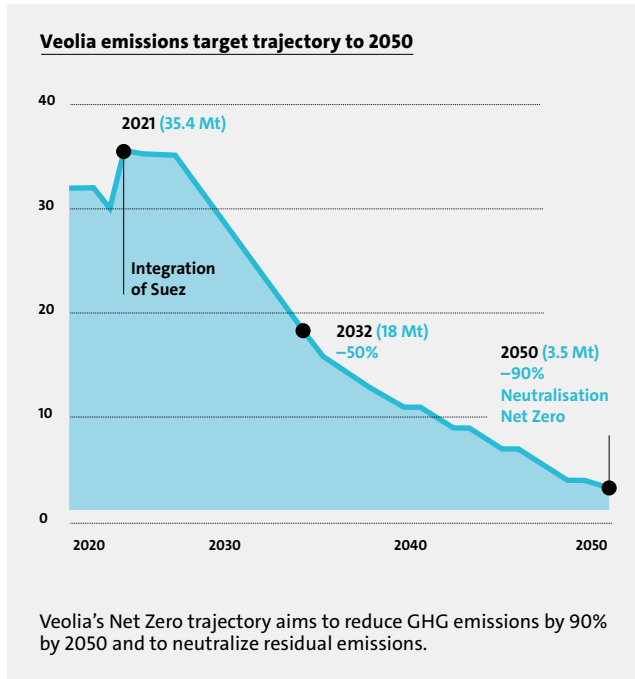




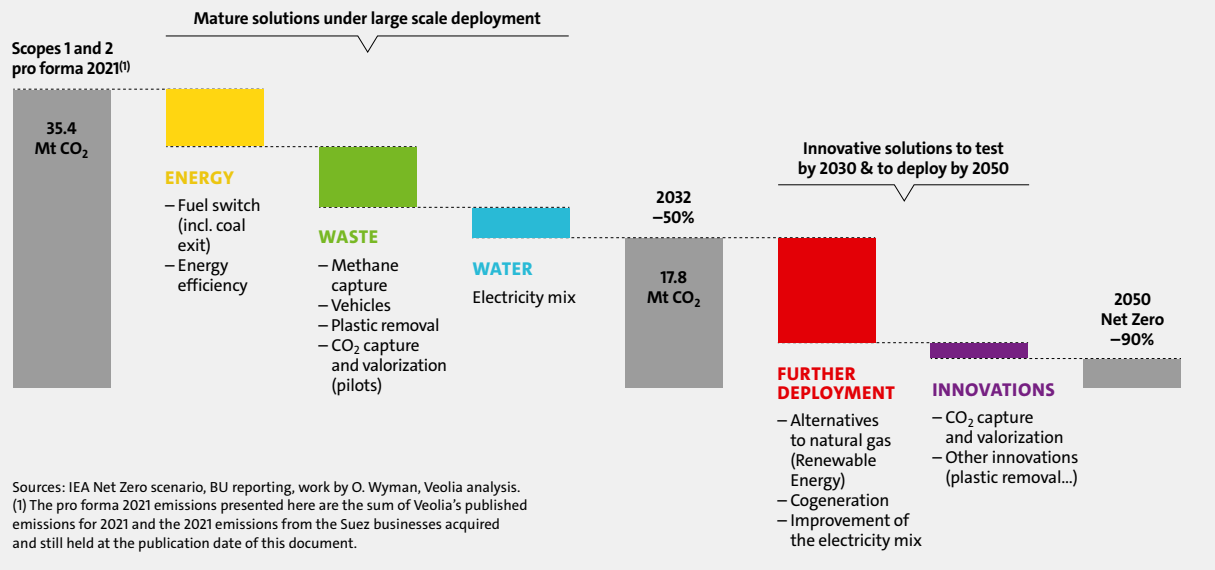
# NET ZERO BY 2050 (-90% SCOPES 1, 2 AND 3)



**Veolia has set itself a target of Net Zero GHG emissions by 2050.** To achieve this objective, the Group will continue to invest in energy transition for its businesses, enabling them to use alternatives to natural gas, such as renewable electricity and CO<sub>2</sub> captured in its incinerators. However, it will remain impossible to reduce a fraction of our emissions (emissions from biological and chemical processes, for example). Sequestration solutions, under extremely strict conditions, will therefore be implemented to neutralize these residual emissions.



## Focus on Veolia's emissions reduction levers to 2050



# INNOVATING TO PREPARE FOR THE FUTURE: DECARBONIZING HEAT NETWORKS

We are innovating to prepare for the future up to 2050. For those activities most difficult to decarbonize, the Group has started to build demonstrators in order to develop reliable solutions with a view to rolling them out at industrial scale.

The development of next-generation heat networks is a major lever for achieving Net Zero in 2050. In this way, the Group is responding to 2 requests from its customers: medium-temperature loops (5 °C to 30 °C, compared with the current 70 °C to 80 °C) and lower-carbon energy mixes.

## 1. Heat and cold network and medium-temperature loops in Saclay

- Principal: Paris-Saclay Public Development Corporation.
- Saclay site: 1 of 8 innovation clusters worldwide (Source: MIT Technology Review).
- Five-year operating contract secured.
- Production sources (50 GWh heat/cold): groundwater geothermal; biogas; waste heat; solar; heat pump.
- Carbon balance: over 50% of energy used is renewable or recovered.
- Challenges:
  - To double production of heat to 100 GWh and cold to 20 GWh by 2028.
  - To adopt a trajectory toward carbon neutrality (2050).
  - To anticipate developments in environmental standards.

## Benefits

- Reduced energy consumption.
- Local renewable energy production (solar; geothermal; energy from wastewater; waste heat; energy storage).
- Flexibility.
- Reduced heat losses.

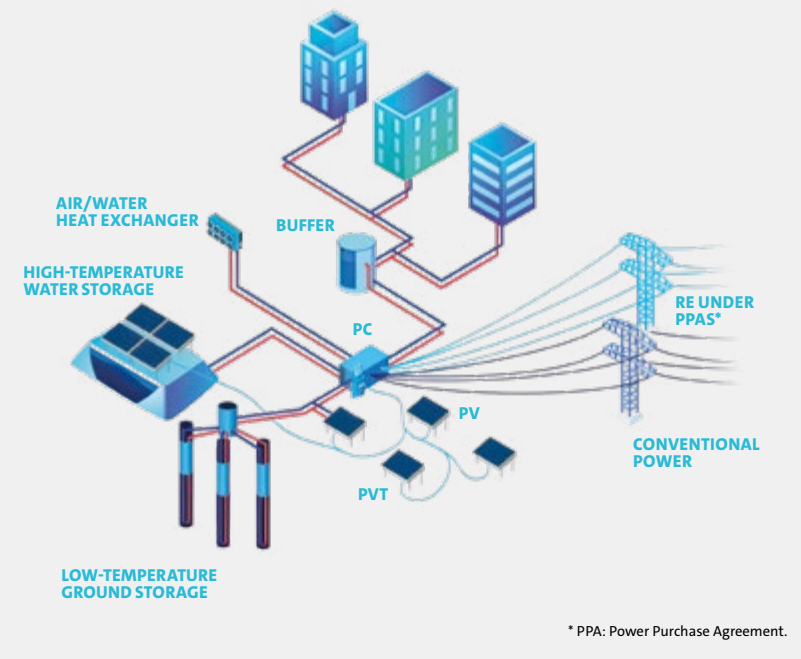
## 2. Heat network in Lidzbark Warmiński, Poland

- Challenges:
  - To create a demonstrator of the "furnace of the future."
  - To use more than 90% renewable energy (no biomass) from 2023 onward.
  - To modernize the network and limit its temperature to 80 °C.

- Site: Lidzbark Warmiński heat network in Poland (Operator: Veolia Pótnoc; Type: homes and businesses).
- Production source: heat pump systems powered by solar panels and 300 geothermal loops, with large (15,000 m<sup>3</sup>) and small (100 m<sup>3</sup>) hot water reservoirs.
- Carbon balance: emissions reduced by 50%.

## "Furnace of the future" demonstrator

Veolia is demonstrating its expertise in innovation and low-carbon energy production solutions with maximum use of renewable and recovered energy in the regional mix.



# REUTILIZING AND RECYCLING BIOGENIC CO<sub>2</sub> AND REDUCING FOSSIL CO<sub>2</sub>

\_\_\_\_\_ We are working on innovative solutions to recycle and reutilize biogenic CO<sub>2</sub> emitted by our industrial customers or from the energy recovery of non-

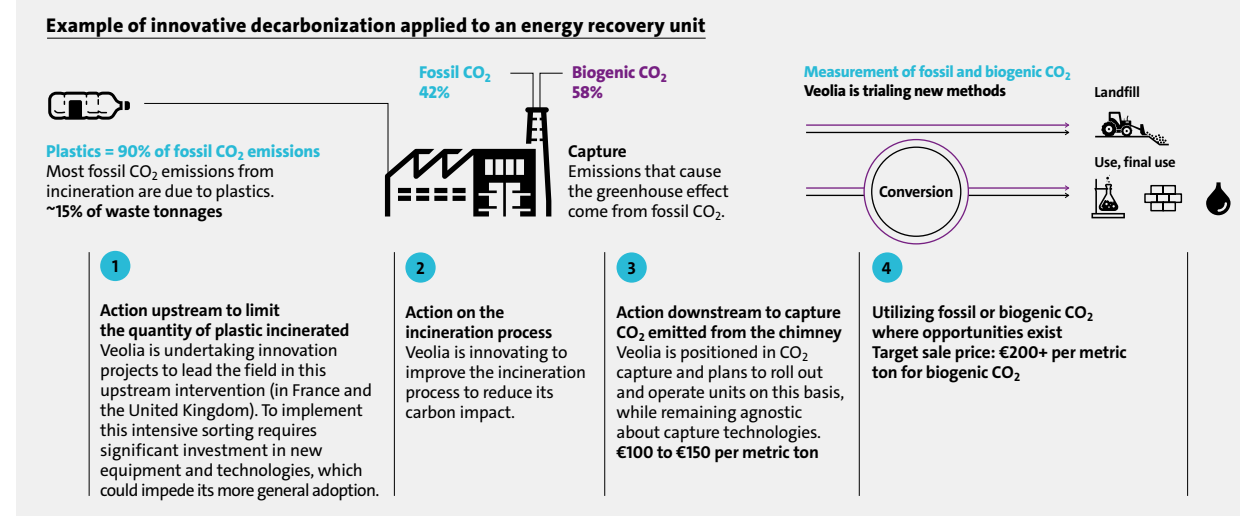
recyclable waste. The transformation of biogenic CO<sub>2</sub> into biofuel could provide a low-carbon alternative to fossil energies, especially in the transportation sector.

At the same time, we are developing new levers for reducing fossil CO<sub>2</sub>, such as the removal of plastics prior to incineration.

Innovation	Source of CO <sub>2</sub>	Processes	Use of recycled CO <sub>2</sub>	Examples	Illustration	Strategy
Measurement of biogenic CO <sub>2</sub>	Waste-to-energy recovery unit	Measurement	–	New measurement methods using satellites, Carbon-14 (e.g. test under way in Lisbon, Portugal)		Accelerate & roll out
Recycling biogenic CO <sub>2</sub>	Manufacturing	Capture & re-utilization	Biomethanol	Odin Project: biomethanol production from paper pulp		Accelerate & roll out
	Waste-to-energy recovery unit	Capture & re-utilization	Sustainable aviation fuel (SAF)	Studies included in the acceleration plan (Portugal & France)		Industrialize the innovation
	Waste-to-energy recovery unit	Capture & re-utilization	Methanol & other low-carbon molecules	Industrial-scale demonstrators and studies included in the acceleration plan (China & France)		Incubate the innovation
Reducing fossil CO <sub>2</sub>	Waste-to-energy recovery unit	Upstream sorting & recovery of plastics	Hydrogen & carbon black	Partnership and pilot study on plasma pyrolysis in France		Incubate the innovation
	Waste-to-energy recovery unit	Capture & storage	Offshore or onshore storage	Studies included in the acceleration plan (UK & Belgium)		Incubate the innovation



Energy recovery unit in Marchwood, UK



## ACCELERATING CO<sub>2</sub> CAPTURE

\_\_\_\_\_ We continue to innovate and to devise future solutions for capturing and utilizing CO<sub>2</sub>. Demonstrators currently in the pipeline should enable us to scale these up to industrial levels.

**1. CO<sub>2</sub> capture at source**  
Veolia plans to develop demonstrators to trial different carbon capture processes:

- Household waste incineration site in France.

- Industrial special waste incineration site in France.
  - Incineration site in Taiwan.
- The Group will launch feasibility studies to develop carbon capture engineering using different processes:**
- Energy recovery unit in Marchwood, UK (180 kt CO<sub>2</sub> annually).
  - Energy recovery unit in Mataró (Spain).

### 2. CO<sub>2</sub> storage

- Energy recovery unit in Marchwood, UK (180 kt CO<sub>2</sub> annually).

### 3. CO<sub>2</sub> utilization

**Demonstrators and studies are testing and developing various ways to utilize CO<sub>2</sub>:**

- CO<sub>2</sub> can be utilized directly in sectors such as farming or manufacturing. A demonstrator is in place at a household waste incineration site in France.
- CO<sub>2</sub> can be transformed into methanol. 2 demonstrator projects are in progress: one at a Veolia incineration site in China and the other in France. These initiatives illustrate the Group's constant efforts to explore and optimize the various possibilities for utilizing CO<sub>2</sub>.



# QUALITY SOLUTIONS TO NEUTRALIZE OUR RESIDUAL EMISSIONS

We are already hard at work developing solutions to neutralize our residual emissions. This effort is in addition to our drive to reduce our own and our customers' emissions.

## Why work to neutralize residual emissions?

1. In 2050, Veolia's businesses will still be emitting residual emissions that it is physically impossible to reduce (fugitive process emissions, residual emissions from capture, etc.).

## 2. It will be necessary to neutralize these emissions to fulfil our commitment to Net Zero by 2050.

Solutions must be found to neutralize Veolia's own emissions and/or issue high-quality carbon credits to help enhance the trajectories of other industries and regions.

3. With an estimated volume of several million tons CO<sub>2</sub> equivalent, Veolia will be a major player in the sequestration market. This market is destined to expand strongly as more and more organizations commit to Net Zero.

We are working on innovative sequestration solutions for the long-term storage of CO<sub>2</sub> in the ground, which will also improve soil fertility in the process.



## Biochar

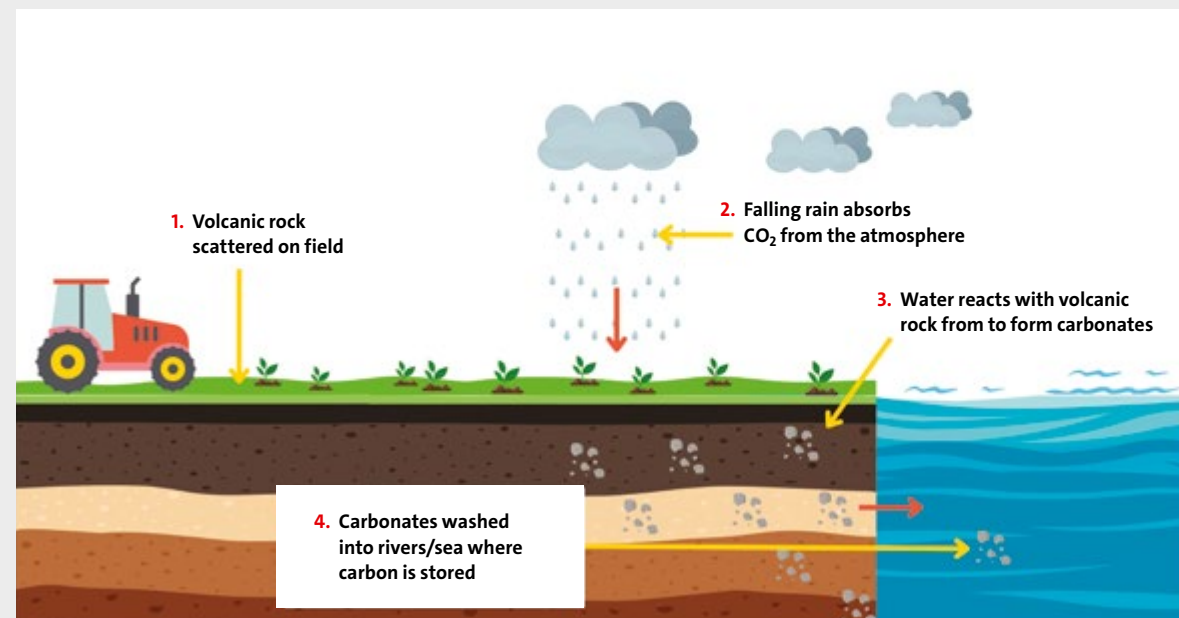
This material is produced via high-temperature pyrolysis of biomass. It helps fertilize soils and makes it possible to store carbon in solid form. Testing is under way to evaluate the feasibility of this approach.



## Enhanced rock weathering

This method involves spreading crushed basalt or silicate rocks on the land, where they react chemically with the CO<sub>2</sub> in rainwater. This reaction forms carbonates in which the carbon is stored for millennia. Testing is planned using 10 kt of rocks.

## How enhanced rock weathering works







## ADAPTING TO **CLIMATE CHANGE**

Alongside our efforts to reduce greenhouse gas emissions, the Group is working tirelessly to adapt our own and our customers' sites to the effects of climate change. The Group has already analyzed the exposure to climate risks for 2,000 sites to facilitate the creation of dedicated action plans.



# OUR EXPERTISE IN THE WATER SECTOR: A MAJOR ASSET IN HELPING LOCAL AUTHORITIES AND INDUSTRY ADAPT

While the Group is already implementing mitigation actions on a massive scale through our decarbonization plan, our water businesses place us at the forefront of the urgent process of adapting to the already visible symptoms of climate change. We are supporting our customers with solutions to help them adapt and improve their resilience.



## EFFECTIVE INFRASTRUCTURE AND FEWER LEAKS IN DISTRIBUTION NETWORKS

The yield from water networks can exceed 80% in developed countries but is often less than 50% in some developing countries. This means that more than half the water produced is lost due to leaks in the networks. Reducing leaks is therefore an effective means of preserving water resources. Veolia has a range of solutions: predictive surveillance, leak detection, and network optimization and repair.

Veolia is also a pioneer in developing nature-based solutions that combine flood risk management with biodiversity protection. In Alicante, Spain, the Group created a natural flood plain designed as a floodable urban park. This innovative green infrastructure draws inspiration from the natural marshes and wetlands of the Mediterranean region. It not only limits flood damage but also contributes to biodiversity preservation by providing a habitat for various local plant and bird species.



Disruption to the water cycle is an early tangible manifestation of climate change, with an alternating pattern of “far too much water” and “far too little” fresh water, or fresh water that is not available in the right place or at the right time. Veolia has proven solutions to help its local authority and industrial customers adapt by taking care of water regionally.

Many regions of the world are already experiencing significant water stress. The world’s population continues to grow, and climate change will only accentuate the disruption to the water cycle that we are already seeing. The Group can offer proven solutions to prepare these regions for the reduced availability of water resources.

## OPTIMIZING AND MANAGING WATER CONSUMPTION (REDUCING RESOURCE EXTRACTION)

Veolia offers its local authority customers solutions aimed at preserving water resources by reducing and managing consumption. In 2023, Veolia renewed its public service delegation contract with the city of Lille, France, with a target of reducing its water consumption by 65 million m<sup>3</sup> between 2024 and 2033.

## MOBILIZATION OF ALTERNATIVE RESOURCES TO PROTECT FRESHWATER RESOURCES

**Reuse of treated wastewater:** Freshwater represents just 2.5% of available water on the planet. In the face of a rapidly growing global population, accelerating urbanization, and global warming, this resource is becoming increasingly scarce. Access to drinking water is now a major environmental, social, and economic challenge for cities and industries. Recycled water can be used for agricultural irrigation (which alone represents 32% of the worldwide market), landscape irrigation, industry, or recharging groundwater tables. We have more than 350 proprietary technologies for treating water in all its forms, including wastewater, through refining, bacterial disinfection, and elimination of micropollutants. In 2022,

Veolia facilitated the reuse of nearly 1 billion cubic meters of wastewater, equivalent to the average annual consumption of 18 million people (in developed countries).

**Seawater desalination:** Desalination is an effective way to combat water stress in arid coastal regions. This solution has great potential, since 40% of the world’s population lives less than 100 km from the sea, with 25% less than 25 km away. Desalination is also an appropriate way to provide drinking water in regions where natural resources tend toward salinity: rivers, estuaries, brackish inland and underground water, etc. The Group desalicates 13 million m<sup>3</sup> of water a day and its technologies are used in more than 108 countries. Veolia is one of the world leaders in desalination solutions that are environmentally sound and energy efficient, based in particular on membrane (reverse osmosis) technologies and the use of renewable energies.



**F O C U S**

**CASE STUDY:  
ADAPTING TO CLIMATE  
CHANGE IN AGBAR AND  
AGUAS ANDINAS**

While the physical impacts of climate change are beginning to materialize in every region where we operate, they have historically been more marked in Spain and Chile. Our local subsidiaries, Agbar and Aguas Andinas respectively, have therefore been working to adapt to climate change for many years.



**AGBAR – SPAIN**

Spain is currently facing a period of chronic drought, which has reached extreme levels since the winter of 2022. This has created severe pressure on water resources. The country is also exposed to extreme phenomena such as heatwaves and violent storms.

In 2021, in response to these climate challenges, Veolia's Spanish subsidiary, Agbar, analyzed the main vulnerabilities and precise level of exposure of the infrastructure it operates. The analysis was based on IPCC climate projections for 2030 and 2050 and covered the increase in temperature, heatwaves, heavy rains, droughts, high winds, rising sea levels, and fires.

Agbar has also developed an ecosystem of dedicated resilience solutions, such as multi-risk (floods, winds, fires, etc.) assessment and alert systems, and the large-scale rollout of wastewater reuse solutions.



**AGUAS ANDINAS – CHILE**

Chile has been suffering megadrought for more than a decade. In December 2022, precipitation into the Mapocho River was down 70% compared with the 1991-2020 average for that month. The Santiago de Chile region is also badly exposed to periods of heavy rains that intermittently cause extremely high turbidity levels.

Standing in the front line against these impacts, Aguas Andinas incorporated climate change issues in its roadmap, with an analysis of its exposure to the effects of climate change. This analysis, based on an RCP 8.5 scenario, highlighted the need to take action in several areas, including an investment program of more than \$300 million to improve Santiago's water autonomy with reservoirs and new wells.





# REDUCING OUR RISKS AND VULNERABILITIES

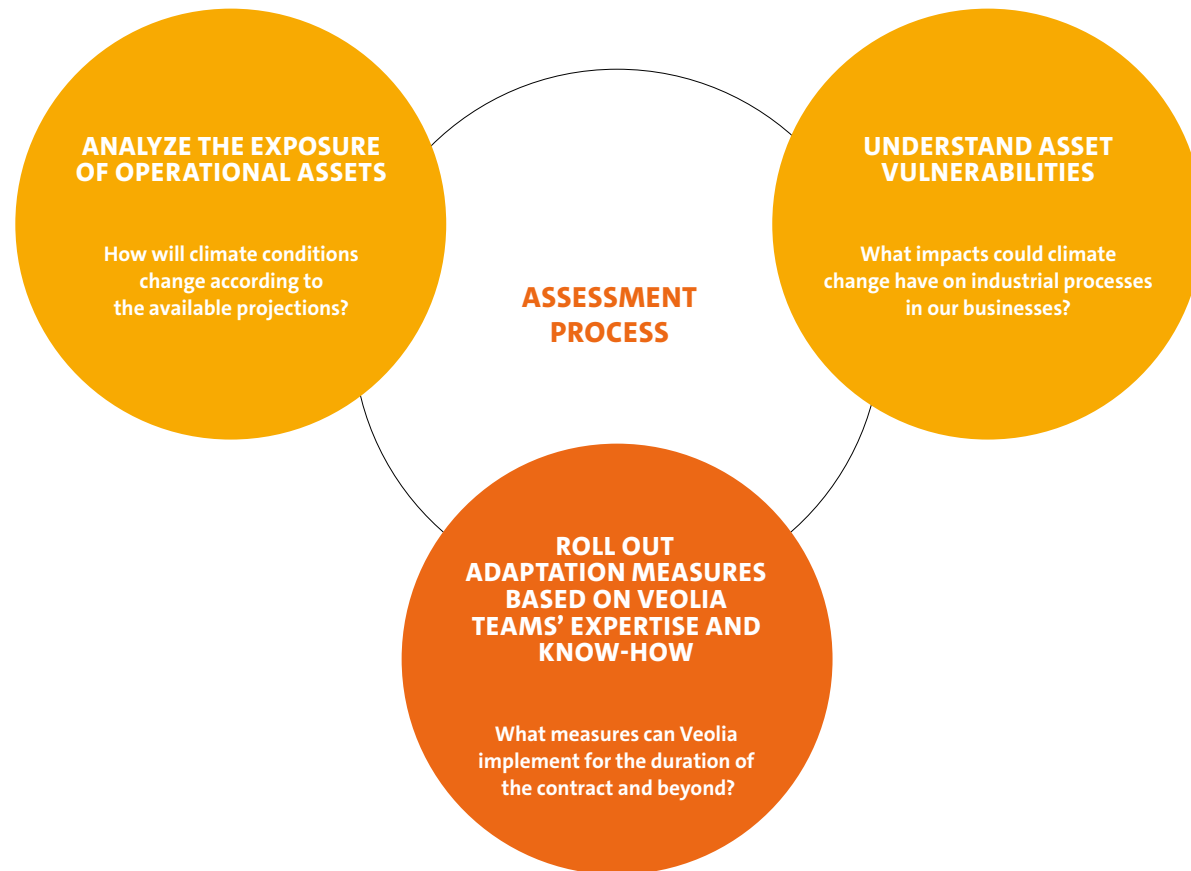
Analysis of the physical risks related to climate change has already been carried out for 2,000 sites. By adapting its operational models to the vulnerabilities and exposure to climate risks in each region, eolia is ensuring the continuity and quality of its services and protecting the infrastructure under its management.

Numerous tools and levers are available to help reduce the risks associated with natural disasters, which are likely to intensify in coming years:

- Choosing a site layout that limits its exposure.
- Analyzing different scenarios in order to implement appropriate prevention plans.
- Keeping business continuity plans up to date.

These measures already contribute to physical risk management.

To complement these initiatives, Veolia has launched a process to assess the operational consequences of acute and chronic physical risks in order to identify the best adaptation strategies at the local level. The Group has prepared exposure and vulnerability analyses based on an updated scenario of global warming of 4 °C by 2100.



In 2023, we analyzed the exposure to physical risk of almost 2,000 assets owned by the Group or operated on behalf of our customers worldwide. This work allows us to better understand the main physical risks the Group faces, and also the possible

impacts of climate change on our operational and environmental performance, thanks to vulnerability studies carried out at the local level. The table below provides a quick overview of how the impacts of climate change

translate into operational impacts for the drinking water production business. It presents example courses of action identified by teams that took part in the pilot studies in 2022 and 2023.

CLIMATE RISK	Examples of operational vulnerabilities identified	Examples of adaptation measures for the water business
HEATWAVES	<ul style="list-style-type: none"> <li>• Maintaining indoor and outdoor working conditions (productivity, health, and safety risks)</li> <li>• Damage to sensitive equipment (electronic and electrical)</li> <li>• Delays to work schedules</li> <li>• Degradation of water quality due to proliferation of algae</li> <li>• Water demand pressures and worsening conflicts over use</li> <li>• Rising costs of energy to maintain operating temperatures</li> <li>• Increased risk of fires and explosions</li> </ul>	<ul style="list-style-type: none"> <li>• Reorganize work schedules</li> <li>• Improve insulation against cold/heat in buildings</li> <li>• Systematically build redundancy into cooling equipment for critical applications</li> <li>• Provide personal protective equipment (PPE) suitable for high temperatures</li> <li>• Improve hydrogen sulfide monitoring</li> </ul>
HEAVY RAINS	<ul style="list-style-type: none"> <li>• Damage to sensitive equipment (electronic and electrical)</li> <li>• Pollution thresholds exceeded</li> <li>• Disruption to supply chains and transportation services (preventing response to callouts)</li> <li>• Turbidity degrading water quality</li> <li>• Facilities for treating wastewater and rainwater overwhelmed</li> </ul>	<ul style="list-style-type: none"> <li>• Raise the height of equipment based on extremes</li> <li>• Prioritize emergency warning systems</li> <li>• Build redundancy into electrical supply equipment</li> <li>• Improved waterproofing of critical equipment</li> <li>• Work with sanitation services before heavy rains occur to clear traffic lanes</li> </ul>
DROUGHT	<ul style="list-style-type: none"> <li>• Scarcity of water resources impacting the production and distribution of drinking water, and cooling requirements</li> <li>• Degradation of water quality creating the need for additional treatment and/or larger facilities</li> <li>• Clay shrinkage and swelling causing infrastructure damage in clay soil areas</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure adequate reagent storage</li> <li>• Install water reuse solutions</li> <li>• Resize facilities to accommodate the additional treatments</li> <li>• Prioritize redundancy in local resources and networking in collaboration with local stakeholders</li> </ul>



# A ROBUST GOVERNANCE

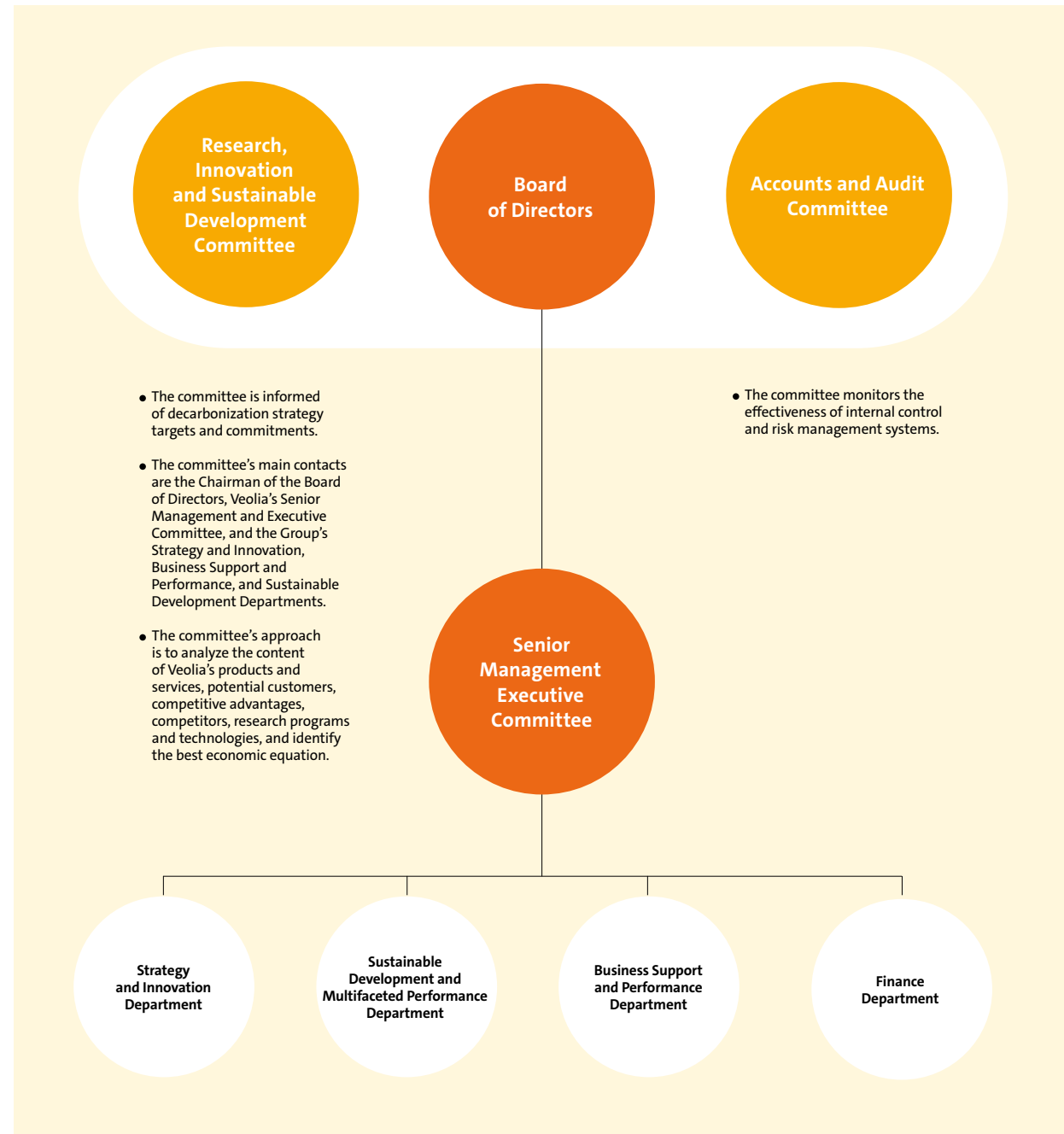
## FRAMEWORK

To meet the challenges of mitigating and adapting to climate change, we can count on the involvement of our governing bodies.



# HONORING OUR COMMITMENTS THROUGH STRONG CLIMATE GOVERNANCE

Our climate governance ensures that our commitments are being met. The management of our carbon trajectory follows a process similar to the way we manage our financial commitments.



# STAYING THE COURSE OF DECARBONIZATION

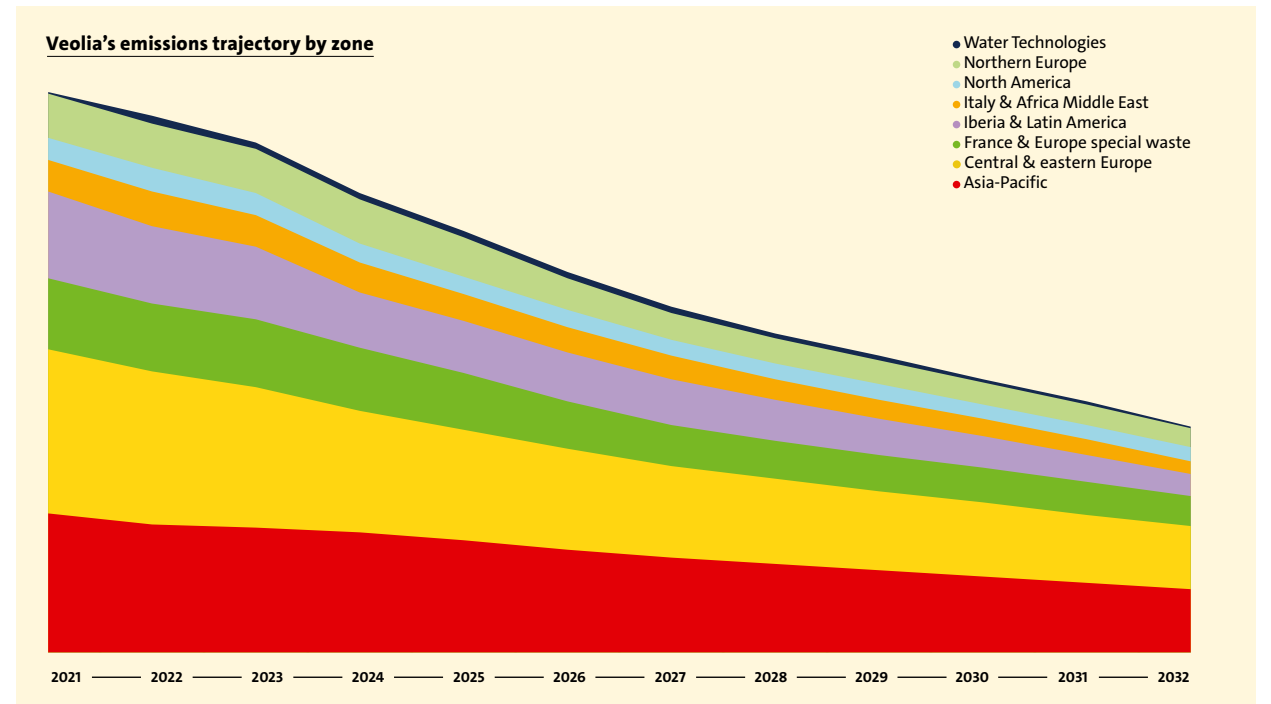
We set precise decarbonization targets for scopes 1 and 2, with CO<sub>2</sub> budgets tailored to each zone. These budgets are established in the same way as financial budgets, taking account of each business sector, growth objectives, and local legislation on CO<sub>2</sub>.

## SCOPES 1 AND 2 TARGETS BY GEOGRAPHICAL ZONE

- To create their CO<sub>2</sub> targets, we defined binding CO<sub>2</sub> budgets for each geographical zone. These are prepared according to:

- The main business sectors, some of which are easier to decarbonize than others.
- Growth targets in the geographical zone, as rapid growth dampens the apparent results of decarbonization.
- Local legislation on CO<sub>2</sub>.

- From January 2024, the Finance Department will monitor each business unit's CO<sub>2</sub> performance on a quarterly basis, with the help of a digital reporting tool linked to CO<sub>2</sub> data from the highest-emitting sites (Key Climate Assets). This step opens the way to more granular management of the Group's decarbonization trajectory.



## COMPENSATION ALIGNED WITH OUR GHG REDUCTION

Compensation for our managers, including the Chief Executive Officer, is now partly index linked to climate performance.

- Up to 5% of Chief Executive Officer's annual variable compensation is index linked to climate performance. The same

- applies to our other senior executives- including the CEOs of geographical zones.
- Performance incentives for Group executives and key contributors are also allocated according to climate performance.
- The criteria used are:
  - Reduction of Veolia's scopes 1 and 2 emissions.

- Achievement of targets on avoided emissions.
- Rate of progress on planned investments to reduce greenhouse gas emissions. It is therefore directly impacted by the speed with which the plan to phase out coal by 2030 is implemented.

# GLOSSARY

## Biogenic CO<sub>2</sub>

CO<sub>2</sub> present in biomass due to photosynthesis – mostly found in food waste and residues from forestry, farming and agrifood.

## Carbon Capture and Storage (CCS)

Capture and storage of carbon, sequestered in deep geological layers.

## Carbon Capture and Utilization (CCU)

Capture and utilization of carbon as a raw material for synthesizing fuel, chemicals, or materials.

## Carbon neutrality

State of equilibrium between anthropogenic emissions and greenhouse gas (GHG) sequestrations, principally achieved by reducing GHG emissions and sequestering residual emissions in biological or technological sinks.

## Cogeneration

Based on the recovery of heat emitted during electricity production, cogeneration is one solution to the current challenges of making energy savings, reducing carbon impact, and lowering costs.

## Energy recovery unit

Facility for incinerating non-hazardous waste to produce electricity or supply a heat network.

## ESG

Abbreviation denoting environmental, social and governance factors used in analyzing a company's extra-financial performance.

## Green electricity

Electricity generated using only renewable energies.

## Incinerator Bottom Ash (IBA)

Residue from waste incineration.

## Oxidization of hazardous waste

Chemical reaction, often caused by oxygen, of potentially harmful or toxic compounds from hazardous waste into less harmful CO<sub>2</sub> and H<sub>2</sub>O molecules.

## Pro forma

Pro forma value reworked to take account of the disposal by Suez of certain businesses (including operations in northern Europe) in 2020 and 2021.

## Renewable energies:

Energy from wind, solar, hydropower, biomass or geothermal sources used to produce heat or electricity.

## Science Based Target initiative (SBTi)

Initiative that helps businesses set greenhouse gas emissions reduction targets based on scientific data in order to achieve the Paris Agreement target.

## Scopes 1, 2 and 3

The terms scope 1, scope 2 and scope 3 are used to describe the carbon balance of a product or organization. The carbon balance serves to determine the emissions generated by the manufacturing and life cycle of a product, or an organization's activities, over a given period. Direct emissions are included in scope 1, while scope 2 accounts for indirect emissions related to energy consumption, and scope 3 other indirect emissions.

## Scope 3 Upstream and Downstream

Emissions linked to the most important scope 3 factors:

- Purchases of products and services
- Fixed assets
- Energy falling outside scopes 1 and 2
- Upstream transportation and distribution
- Waste
- Business travel
- Commuting
- Transformation of products sold
- Use of products sold

## Scope 4

Reductions in emissions brought about by an organization's activities, products or services when these reductions occur outside the scope of its own business.

## Solid Recovered Fuel (SRF)

Solid fuel derived from non-hazardous waste and converted to energy when incinerated.

## Ton equivalent CO<sub>2</sub> (t CO<sub>2</sub> eq.)

Unit of a measure devised by the IPCC to compare and combine the impact of different greenhouse gases (GHGs) over a given period of time.

## DISCOVER OUR PUBLICATIONS AT VEOLIA.COM





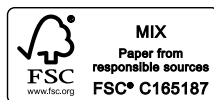
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# Resourcing the world

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