



## MAKING THE IMPOSSIBLE POSSIBLE

Focus  
Climate change



06.



34.



60.

## PLANET

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# PLANET

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**ESTELLE BRACHLIANOFF**  
Chief Executive Officer of Veolia



**Transforming the impossible into the possible: what could be more difficult, yet more exciting?** What could be more demanding, yet more urgently needed? Particularly when it comes to environmental services. Because fundamentally this is our role: helping our customers transform themselves, accomplishing what they cannot manage alone, sometimes even do what they dared not imagine could be done. This is the mark of a global champion: the desire to constantly push the bounds of the possible, to blaze a trail for others to follow, to create something where there was nothing.

**“Our business is the ecology of solutions. An ecology that is positive, never punitive. An ecology that unites, not divides. A concrete ecology that delivers genuine solutions.”**

**The record-breaking results we achieved in 2022 despite the strong economic and geopolitical headwinds are a demonstration of this role,** proof that we have once again been able to adapt and grasp opportunities, thanks in particular to the ReSource program launched in spring 2022. Our solutions — those we already have and those we are in the process of inventing — give us the resources we need. The merger with Suez, so successful and so promising, drives us on. The energy, creativity and talent of our 220,000 Resourcers encourage us.

**We stand ready.** Ready to decarbonize industries and cities. Ready to tackle the most complex and most toxic forms of pollution. Ready to regenerate resources by transforming something seemingly useless, harmful even, into something useful. In other words, we stand ready to reach for the

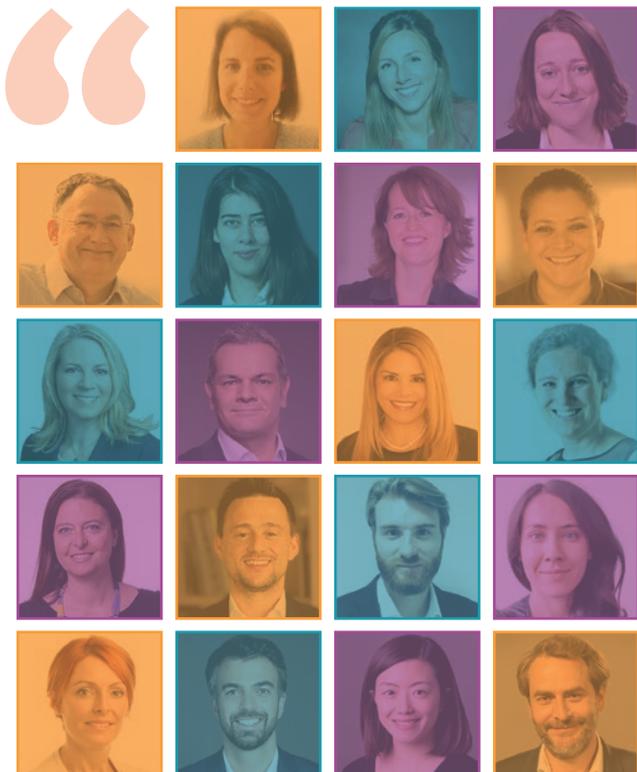
impossible. This is what makes Veolia the business far and away the most actively engaged in decarbonizing, depolluting and recycling. Even if we still have plenty to do and many new solutions to invent.

**Which is a good thing, because the ecological transformation of the world’s cities and industries cannot wait a moment longer.** It has never been more essential or more urgent. And it is so difficult, so vast, that it can seem unattainable. But every day, in each of our activities and at all of our sites, we prove that it is possible.

**Because ecological transformation is our Group’s purpose.**

Because our business is the ecology of solutions. An ecology that is positive, never punitive. An ecology that unites, not divides. A concrete ecology that delivers genuine solutions. Solutions that are robust, efficient and affordable. Real-world solutions responding to local issues. Solutions that are attractive and desirable. Solutions that make the impossible possible. In short: Veolia solutions.

## Contributors



## 220,000. We. Employees at Veolia.

We are a unique team engaged  
in ecological transformation.  
We are the Resourcers.

And this *Planet* is our magazine.  
But it is also yours...  
All of you who work every day for a more sustainable  
and desirable future.  
Read about our stories and projects, as well as your own.  
Let's share our commitment and our solutions for the planet.  
Together we can turn the tide.  
Together for ecological transformation.

**Together, let's make the impossible possible.**

**Editors-in-Chief (left to right):** Laure Antoni, Claire Billon-Galland, Manon Capmarty, Martin Curtois, Selen Daver, Fanny Demulier, Feryel Gadhoun, Carrie Griffiths, Jose Guerra, Denisse Ike, Eva Kucerova, Gabriella Lazzoni, Nicolas Levy, Robert Lozano Vergés, Evgeniya Mazalova, Kate Moonen, Romain Prudent, Justine Shui, Arthur Thoux.



Pascal CANFIN

### Pascal CANFIN

**Member of the European Parliament, Chair of the Committee on the Environment, Public Health and Food Safety**

Before being elected to the European Parliament in 2019, Pascal Canfin was Deputy Minister for Development at the Ministry of Foreign Affairs (2012-2014) and Director General of WWF France. Pascal Canfin is a graduate of the *Bordeaux Institute of Political Studies* and the University of Newcastle. He worked as a journalist for *Alternatives Economiques* (2003-2009) and hosts the "Ecological Transition" podcast, a series of conversations with agents of change.



Yannick MONGET

### Yannick MONGET

**Futurist, author and environmentally engaged artist**

At the head of the Symbiom Group, which he created in 2008 with the astronaut Jean-François Clervoy; Jacques Rougerie, member of the French Academy of Fine Arts; the lawyer and former French Minister for the Environment Corinne Lepage and others. Monget's ambition is to raise awareness among the general public, decision-makers and industrialists regarding contemporary environmental issues. A network that he strengthened by founding the Symbiom Group, alongside many international figures committed to protecting the planet and promoting peace throughout the world.



JUNE 5

# WORLD ENVIRONMENT DAY

## #BeatPlasticPollution!

World Environment Day has become one of the largest global platforms for raising awareness of environmental issues. For its 50th anniversary, the focus will be on solutions for fighting plastic pollution.

This is an opportunity to reflect on a problem that is “a visible threat that impacts every community around the world,” in the words of Jean-Luc Assi, host country Côte d'Ivoire's Minister of Environment and Sustainable

Development. The event is also supported by the government of the Netherlands, whose Minister for the Environment, Vivianne Heijnen, declared that “we need true, effective and robust solutions.” [www.worldenvironmentday.global](http://www.worldenvironmentday.global)

I N 2 0 5 0

A T R A N S F O R M E D

W O R L D

French author and futurist Yannick Monget gathered around his “Hopes” project Nobel prize recipients, scientists, explorers and astronauts, representatives of indigenous communities, philosophers and environmentalists from around the world. These figures deliver their vision of the future and, above all, their messages of hope for humanity and our world.

**Sources: all the illustrations, quotes and testimonials in this section are from the book “Hopes, Another World is Possible,” Yannick Monget, Symbiom Editions (2021).**

**NEW YORK  
Times Square  
2050**

“My good friend Yannick shows us different images of the future with his talents as a graphic designer. Images of the future where men are on the verge of extinction, and other images where men know how lucky they are to be living on this Earth and have made efforts to live in symbiosis with nature. He is using his imagery to make us appreciate the danger that awaits us. He is trying to wake us up so that we can amend our way of life. It is not too much of an exaggeration to say that we have few options. It is we who decide our future. It is time to bring this era to an end where men

arrogantly appropriate all the planet's resources. We must now start to appreciate what this planet gives us and learn to think of life as sacred, living together wisely with all living things. The ecosystem is constituted of a balance between all species. If one of them becomes extinct, the impact on the entire ecosystem can be enormous.”

**Ren Yabuki**

Japanese actor, animal activist and founder of the NGO Life Investigation Agency (LIA)



© YANNICK MONGET



© YANNICK MONGET



## **PARIS** **Champs Elysées** **La Défense** **district** **2050**

“Scientific advances in recent decades have been such that increasingly reliable information is now available to support decision-making at all levels, from governments to individuals. All stakeholders must play their part: civic society, local authorities, the private sector, etc. Ignorance can no longer be an excuse for inaction. The cost of inaction will be much greater than the cost of action. Our generation has an unprecedented historic responsibility.”

**Michel Jarraud**

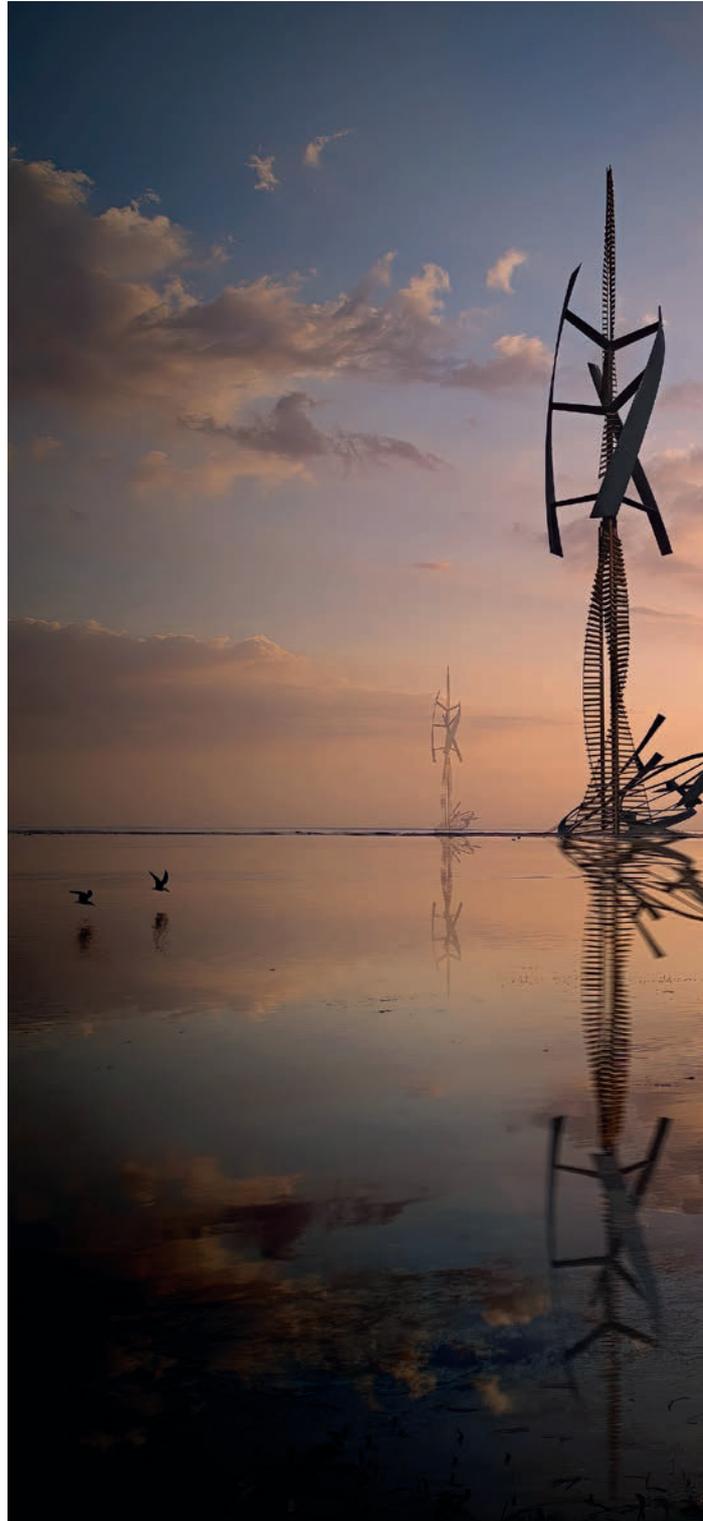
Secretary General of the World Meteorological Organization (WMO) 2004-2015

## **SEA OF JAPAN 2050**

“Hope lies in the youth as they rise to the challenges, tackling projects that will make this a better and more peaceful world; the human intellect – new technologies will solve many though certainly not all of our problems; nature is resilient—places we destroyed can, given a chance, once again support biodiversity and animals on the brink of extinction can be given another chance; and the indomitable human spirit – the people who tackle what seems impossible and won’t give up.”

**Jane Goodall**

Ethologist and environmental activist  
Founder of the Jane Goodall Institute



© YANNICK MONGET





**NAMIBIA**  
**Solar**  
**biomimetic**  
**city**  
**2050**



© YANNICK MONGET

“As I flew around the world in my solar plane, I remember watching the Sun supplying my four electric motors and their enormous propellers with energy. There was no noise, no pollution, no fuel... and I could keep flying forever. I said to myself at the time: ‘This is science fiction, I’m already in the future.’ Then I realized ‘that’s not true at all, I’m in the present. This is what I can do with today’s technology.”

**Bertrand Piccard**

Founder and President of the Solar Impulse Foundation

## AUSTRALIA Gold Coast 2050

“2050, the Queensland Gold Coast — the playground of Australia, renowned in earlier times for its long surf beaches and lagoons. Today, those beaches are long gone, replaced by huge dikes erected to protect the hinterland from rapidly rising waters. These gigantic constructions, stretching for many kilometers along the coastline, are also an important source of renewable energy, generating large amounts of electricity from tidal action and from the extensive solar farms built along their crest.”

**Ian Dunlop**

Member of the Club of Rome,  
former chair of the Board of the Australian Coal Association



© YANNICK MONGET







## **EARTH'S ORBIT**

### **Space station**

### **2050**

“When you view Earth from the International Space Station, you realize that there's a family on Earth; friends, people living and a unique ecosystem. And when you look in the opposite direction, beyond the Earth, you see stars that are infinitely distant. And if there's life on other planets, that too is infinitely distant. Then you also realize that our civilization on Earth is both unique and alone. Alone in the infinity of the cosmos. That's why we have to protect our planet and its unique ecosystem.”

**Sergey Revin**  
Cosmonaut

**“Put this book down for a moment and take a deep breath. Do you smell that fresh air? At this very moment you are breathing in air produced by the great trees of the world. Think about that! This is why I ask you who are reading this book to take care of our planet.”**

**Mundiya Kepanga**  
Chief of the Huli tribe  
in Papua New Guinea

© YANNICK MONGET



**AUSTRALIA**

# Gold Coast accelerates its material recycling strategy

Veolia won the country's first-ever integrated waste management contract in Australia's sixth-largest city: Gold Coast, Queensland. A popular tourist destination in Queensland, it is also one of the host sites for the 2032 Brisbane Olympics. This new type of contract combines the management and optimization of facilities for the entire processing value chain (collection, sorting, and recycling) to help the region reach its resource recycling and large-scale decarbonization goals. This is a high priority for ecological transformation in Australia, where 27% of waste currently goes to landfill; the target for 2030 is an 80% recovery rate and a 43% fall in greenhouse gas emissions.

**IN COLOMBIA, VEOLIA TEAMED UP WITH CEMENT MAKER ARGOS TO RECOVER OILY SLUDGE** from Ecopetrol's oil refining operations. Waste is converted into solid recovered fuel (SRF), which then fires the cement furnace at the Zona Franca Argos plant, cutting fossil fuel use by around 5%.

**FOUNDATION**

## Veoliaforce is deployed after the earthquake in Turkey

The Veolia Foundation was quick to react to support the recovery of essential services in the aftermath of the earthquake that devastated parts of southeastern Turkey and northern Syria on February 6, 2023. It was active in the field from February 12, coordinating with Veolia teams in Turkey to provide an Aquaforce 2000 mobile water purification unit. Installed during the humanitarian emergency phase near Antioch, in one of the hardest-hit regions, the unit supplies safe water to a refugee camp run by AFAD, the state disaster relief body. It operates for 13 to 14 hours a day to provide drinking water to around 800 people living in the camp.

## WORLD

### 2022, a historic year

Veolia achieved record financial results in 2022. Net income was up 30%, exceeding €1 bn for the first time, generated by new contracts, particularly in energy, as well as by cost savings and synergies, accounting for almost half of the total. Group revenue was up almost 50% to €42.9 bn, driven to a large extent by the acquisition of Suez. The global champion of ecological transformation enters fiscal 2023 in excellent shape, well placed for another year of strong growth.

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**AS PART OF A PILOT PROJECT, VEOLIA AND BEBAT ARE USING CYCLE COURIERS FROM CARGO VELO** to collect used batteries in the cities of Ghent, Brussels and Antwerp in an environmentally friendly manner. The idea is to improve traffic fluidity over the long term and help improve air quality in the center of the three Belgian cities.

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## UNITED ARAB EMIRATES

### Treatment of a petroleum site's hazardous waste

A consortium comprising Veolia, Vision Invest and ADQ signed a historic agreement with Abu Dhabi National Oil Company Refining (ADNOC Refining) for the treatment of hazardous industrial waste. The contract covers the operation of two hazardous treatment plants at the Al Ruways industrial complex with a cumulative annual capacity of around 70,000 metric tons. The partnership sees Veolia supporting ADNOC, a major industrial group, in its ecological transformation, and cementing its own position as the Middle East's leading provider of hazardous waste management solutions.

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**LIXO AND VEOLIA WON 1ST PRIZE FOR THE BEST ALLIANCE OF 2022 AT THE 4TH DAVID WITH GOLIATH AWARDS FOR COLLABORATIONS BETWEEN START-UPS AND CORPORATES.** Lixo's technology solution uses image analysis to help waste management actors examine waste streams in detail so they can improve management, sorting and material recovery.

## UNITED KINGDOM

### Seafield's WWTP reaches energy self-sufficiency

Energy self-sufficiency is the order of the day at Seafield, Scotland's largest wastewater treatment plant in the Leith district of national capital Edinburgh. Since 2022, the plant has been recovering biogas from sewage sludge to produce 108% of the renewable electricity it needs to operate: an excellent way to shrink its carbon footprint and, by exporting its excess production, to relieve pressure on the local power grid. This achievement is the result of a partnership between Veolia and Scottish Water, which aims to achieve net zero in what is the UK's fourth most energy-intensive sector. Seafield treats wastewater for approximately 850,000 people from Edinburgh and the surrounding area, employing a range of innovations covering anaerobic digestion, thermal hydrolysis and 3.9 MWe of combined heat and power technologies.



## WORLD

### The Resourcers, Veolia's largest shareholders

Veolia employees now own 6.5% of the share capital in the business, making them the largest single shareholder. Sequia 2022, the employee stock purchase plan, was offered to over 179,000 employees in 45 countries and saw a take-up rate of 42%, the highest ever in Veolia's history. The positive reception for what was the first operation since the acquisition of Suez demonstrates the faith shown by the 75,000 or so employees who chose to subscribe. It also underlines the successful integration of new colleagues, whose take-up rates were similar to overall rates – and actually higher than the overall rate in 2021.

**TANZANIA**

## Improving access to drinking water in the region of Mwanza

In partnership with NETWAS Tanzania, Veolia was awarded a design and supervision contract to improve the drinking water supply and the distribution infrastructure in Mwanza, Tanzania's second largest city. The regional capital sits on the shores of Lake Victoria and has substantial water resources, but its existing infrastructure is insufficient to meet the needs of its rapidly growing population. Financed by the French Development Agency on behalf of the Mwanza Water Supply and Sanitation Authority, the project is part of the Tanzanian government's Development Vision 2025. It includes the construction of four new storage reservoirs, six booster stations, close to 50 kilometers of transport mains, a distribution network of around 450 kilometers, and over 10,000 customer connections.



**THE BLACK EQUAL OPPORTUNITY EMPLOYER JOURNAL**, a leading African American career and business platform, named Veolia North America as a "Best of the Best Employer" in 2022, recognizing its commitment to ensuring an inclusive culture that values original skills and attracts talent with unique experiences.

**WORLD**

## PlastiLoop, Veolia's new offer of ready-to-use recycled resins

At this year's K Show, the leading international trade fair for the plastics and rubber industry held in Dusseldorf, Germany, Veolia launched its new PlastiLoop solution that allows plastic manufacturers to access supplies of recycled plastic resins in every part of the world. This unique, integrated platform offers a range of polymers, arranged by application, to meet each specific requirement. With an ever-growing number of manufacturers keen to commit to using recycled plastics, PlastiLoop offers a practical solution, partly to reduce their carbon footprint and partly to take action to reduce the use of virgin plastics.

**VEOLIA WON A MULTI-MILLION DOLLAR CONTRACT COVERING A FULLY INTEGRATED SEAWATER TREATMENT MODULE** for One Guyana, a floating production, storage and offloading (FPSO) unit that operates off the coast of French Guiana.

**FRANCE**

## The French Riviera has the first "Climate Transition Experimental Territory"

During the process of drafting its *Plan Climat-Air-Énergie Territorial* (Territorial Climate-Air-Energy Plan), and aware of the importance of partnering with a private sector actor to help deliver its program, the French Riviera multi-council authority signed the first-ever Climate Transition Experimental Territory protocol with Veolia, an agreement that will run for three years. Against a background of rising energy prices, water stress and the exhaustion of natural resources, Veolia has the capacity to address problems centering on these three challenges and to help the authority manage the tasks it is responsible for: protecting water resources and searching for alternative resources, shifting to energy frugality, and ramping up recycling and material recovery.

# TRENDS

## Space as a circular economy model for Earth

The space sector is an expert in air, water, and waste recycling. It represents a highly strategic challenge, leading ESA (Europe) and NASA (USA) to regularly launch calls for ideas to identify new technologies for recycling and reducing materials in space. On board the International Space Station (ISS), an astronaut produces an average of more than 2 liters of grey water (cooking, showering, etc.), 1.5 liters of yellow water (urine) and 0.2 liters of black water (organic waste, excrement) every day. Today, 90% of grey and yellow water is recovered, filtered, treated, and reused, thanks to a unique and proven sanitation system, which eliminates all health risks. Drinking water accounts for 90% of the mass initially launched into space, and the aim is to recycle it in its entirety.

The air is made breathable in the passenger compartment using an innovative system developed for NASA, which captures excess CO<sub>2</sub> and maintains air quality. In space, nothing goes to waste. Food scraps, clothing and used or faulty equipment are recycled and can become a source of energy, refueling and even spare parts. As demonstrated by the Refabricator, a recycling unit and 3D printer on board the ISS. This hybrid machine, based on technology not used on Earth, is capable of transforming plastic into high-quality filaments suitable for 3D printing. New objects and spare parts can be created directly in space. As a source of inspiration and innovation, space might well be where we will find the answer to our challenges here on Earth.

1. Source: CNES (French National Center for Space Studies)



## Good news on ozone layer recovery

The UN has announced that the ozone layer, which filters out the sun's harmful rays, is on track to recovery. Further proof that climate action is possible and that it pays off. The hole in the polar ozone layer, detected in the early 1980s, led to a global

response: the 1987 Montreal Protocol banning chlorofluorocarbons (CFCs). Since then, 198 states have ratified the protocol and banned these harmful gases – CFCs and halons – which were widely used in refrigerators, air conditioners and aerosols.

According to the UN, abandoning these ozone-depleting gases has also made it possible to avoid a temperature rise of 0.5 °C to 1 °C by 2050. Excellent news for the environment. ▶

# Making the impossible possible

The impossible becomes possible when we use our collective intelligence to invent tomorrow's world. The #ImpossibleIsPossible campaign's proposals may seem optimistic at first glance, but they are firmly anchored in reality, as demonstrated by concrete achievements in different parts of the world.



Watch the campaign video



“There are so many things that may seem impossible to us. But when we focus all our energy on a single goal, we are able to achieve extraordinary feats.”

Estelle Brachlianoff  
Chief Executive Officer, Veolia

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The campaign's seven messages, presented in the form of polaroids, give the Group's employees the opportunity to talk about solutions that seem impossible and yet are already a reality at Veolia. But while 50% of the solutions already exist, 50% have yet to be invented. Ecological transformation is in our hands: it relies on our ability to invent a desirable world for the future.



What if...  
... paper helped us travel the world?

## A campaign that promotes the ecology of solutions

In Äänekoski, Finland, Veolia launched the world's largest biorefinery project producing CO<sub>2</sub>-neutral bio-methanol from a pulp mill, offering a new source of sustainable fuel to replace fossil fuels.



What if...  
... we cooled ourselves down using light?

On the Sippy Downs university campus in Australia, Veolia installed photovoltaic panels that generate energy to cool water stored in a tank, which is then injected into the cooling circuits to power the air conditioning systems in the university buildings.

Cooling paving stones made from scallop shells were laid in a school playground in Bordeaux, France. Rainwater, which is recovered, stored and treated, using a system developed by Veolia, runs through these paving stones to keep them cool.



What if...  
... the marine world kept our cities cool?



What if...  
... plants could be used  
to clean polluted water?

In Budapest, Hungary, Veolia treats wastewater from around 300,000 inhabitants. The station combines conventional treatment technology with water-related engineering that uses plants, bacteria and microorganisms to naturally reduce the presence of pollutants in the wastewater.



What if...  
... our food could generate  
energy?

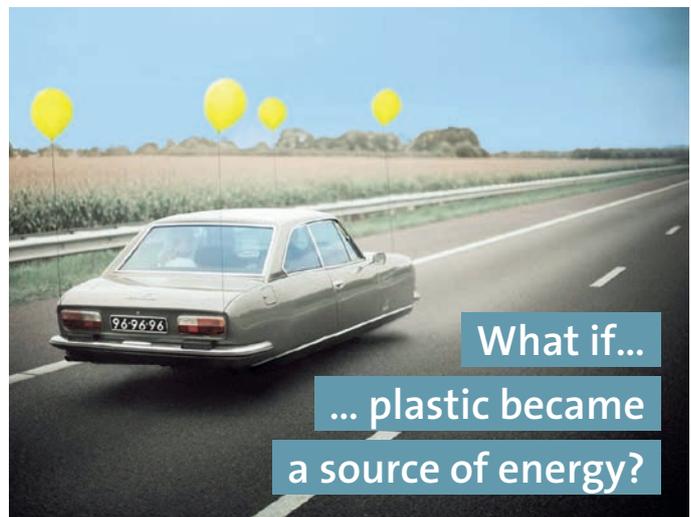
In Gloucestershire, United Kingdom, Veolia produces 4.56 GWh of renewable electricity – enough to power 1,400 homes – by recovering food and farm waste.

In Roquebrune-Cap-Martin, France, Veolia captures energy from wastewater and uses it to heat the 300 homes in the town. Thereby creating a locally sourced and readily available resource.



What if...  
... we could heat our homes  
using wastewater?

In Yeosu, South Korea, Veolia transforms non-recyclable plastic waste into solid recovered fuel to satisfy the energy needs of the country's industry.



What if...  
... plastic became  
a source of energy?



## OBSTACLES TO OVERCOME

- 1 Myth of limitless water
- 2 Highly restrictive national regulations
- 3 Lack of awareness
- 4 Official reluctance, particularly from health authorities

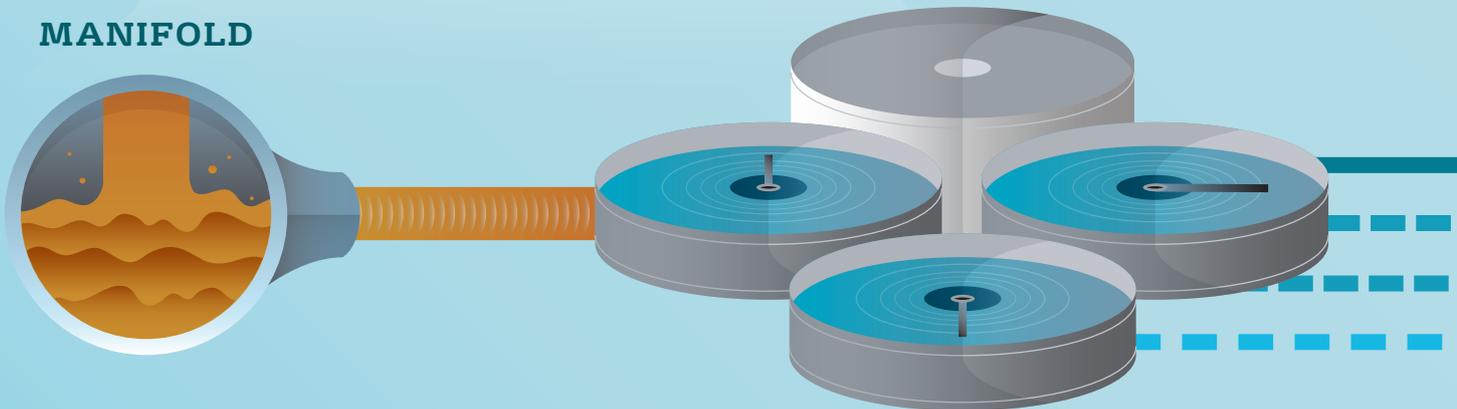
JUNE 26, 2023

## NEW EUROPEAN REGULATIONS ENTER INTO FORCE



### WATER TREATMENT PLANT

### MANIFOLD



# WATER RECYCLING: PROGRESS IN EUROPE

**Water is a non-renewable natural resource threatened by the impacts of global warming. New European regulations to reduce water stress were adopted on May 5, 2020 and enter into force on June 26, 2023. The aim is to regulate how treated wastewater is reused.**

In recent years, droughts and water shortages have reached worrying levels, exposing water resources to increasing risks. A number of European countries are already feeling the effects of unpredictable weather conditions, such as those in the Mediterranean basin, and have taken steps to reuse treated wastewater. These countries are far ahead of France, which is hampered by overly strict regulations and a lack of public awareness. France reuses just 0.6% of its wastewater, compared

## IRRIGATION



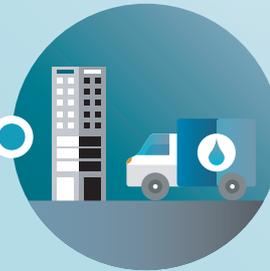
## INDUSTRIAL USES



## LIMITS AND GREY AREAS

- 1 Zero visibility about extension to cover uses other than agricultural
- 2 Lack of pathways or fixed targets for countries
- 3 What government support will be provided to build an economically robust model (similar to when renewable energies launched)?

## URBAN USES



## DRINKING WATER

## BENEFITS



Alternative source reduces water stress



Solutions for long-term management of volumes of available water



Similar quality and practices from country to country



Potential for reusing wastewater in France: 1.6 bn cubic meters



Europe catches up with the USA, Australia and Israel

**PRIORITY:** guarantee sufficient quantity and quality of drinking water, critical to human life

to 8% in Italy and 14% in Spain. However, a succession of extreme weather events has led to growing awareness of the problem and greater acceptance of the idea of reusing wastewater. The new European framework promotes using this solution, initially for irrigation, to preserve groundwater and surface water resources. Additional uses should gradually follow. As a pioneer in the field, Veolia is convinced this is the path to take. Backed by its proven international

expertise, Veolia is keen to share its experience with European policymakers. By adopting a clear and robust business model for reusing treated wastewater (to be defined in collaboration with public authorities) that combines short-term solutions with integrated water resource management over a period of 10-15 years, France and Europe should at last be able to plan for sustainable water management at the local level. ▀

# How can we tackle the challenges facing ecological transformation?



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# R I N G



## With Pascal Canfin and Estelle Brachlianoff

### **PASCAL CANFIN**

Member of the European Parliament,  
Chair of the Committee on the Environment,  
Public Health and Food Safety

### **ESTELLE BRACHLIANOFF**

Chief Executive Officer of Veolia

# W W S



**“The circular economy is one of the responses if we are to achieve sovereignty for France and Europe.”**

**Estelle Brachlianoff**

Energy efficiency, transitioning to a circular economy and sustainable management of water resources are some of the levers available to ensure the success of ecological transformation. And they may require changing the rules of the game.

**Ecological transformation is Veolia's purpose and is central to the concerns facing the people of Europe. Around 80% of Europeans believe that pollution and resource scarcity are serious, immediate dangers. What is Europe's role and what is the best way to combine European sovereignty and ecological transformation?**

**Pascal Canfin:** The European Green Deal, climate neutrality and zero carbon are fully compatible with European sovereignty and strategic independence. The energy crisis we are experiencing, with prices spiking sharply and supply shortages, is a stark reminder of our reliance on fossil fuels. The challenge is to identify a response that avoids swapping dependency on Russian gas and oil for dependency on fossil fuels from other sources, whether America, Qatar, Algeria or elsewhere, and does not create new dependencies on strategic raw materials we do not have. This is why, in March last year, the European Commission put forward a set of legislative proposals to promote greater recycling and recyclability. We also need to increase the diversity of our critical raw material suppliers. "Responsible" mining might be another possibility worth exploring. If we need lithium to manufacture electric batteries, and there are deposits in Sweden, why not source it from Europe? Finally, if we set ourselves the fundamental goal of becoming less reliant on raw materials we don't possess, then knowing how to recycle or extract them in Europe is not enough: we also need to identify alternatives. This is one of the central challenges.

**Let's turn now to energy, another major concern for Europeans. How does Veolia intend to halt the use of gas and coal to fuel the power plants it manages, particularly in Europe?**

**Estelle Brachlianoff:** We face two imperatives: decarbonizing our activities and helping our customers to decarbonize theirs. We therefore use two measurement and targeting metrics identifying Veolia's CO<sub>2</sub> emissions and the emissions we help avoid, eliminate or reduce for our customers. We have made a promise to cease the use of coal in Europe by 2030, and we will be replacing coal-fired power plants with units that employ an energy mix comprising gas, biomass and alternative energies. This is a major industrial program representing a 1.5-billion-euro investment for Veolia. We are investing 300 million euros in 2023 in Braunschweig, Germany,

to convert the coal-fired power plant supplying the city's district heating and electricity networks to run on biomass. We invested a similar sum in Poznań, Poland, in 2022.

**What is the economic rationale behind the biomass used?**

**E.B.:** Our mix uses biomass from waste, meaning we don't tie up farmland that could otherwise grow food for people or animals. We replace coal with biomass from unexploited waste streams from forestry, farming and private homes. This is a potential energy source that is insufficiently exploited in France and Europe generally. It's true that biomass cannot replace 100% of fossil fuel in the energy mix, but it can make a significant contribution. In France, for example, the amount of energy generated from solid recovered fuels (SRF) is equivalent to almost 15% of what was previously imported as gas from Russia. And biogas produced at sewage plants and landfill sites is equivalent to 25% of the volume previously imported from Russia. These two sources alone represent 40% of the energy to replace. At the Solvay site in Lorraine, France, Veolia has replaced coal with SRF, resulting in a 50% cut in CO<sub>2</sub> emissions. Biomass is a local, affordable and renewable energy resource that ticks many boxes, including helping our countries boost their strategic independence.

**How do you see your role, and what changes in the rules might be needed to ramp up the shift toward energy efficiency and frugality?**

**E.B.:** Energy efficiency is one of our specialties. Our aim is to help customers cut their energy use. For example, in March 2022, we launched a plan called ReSource that involves massive investments around the world at installations belonging to us and to our customers. Our two-year target is a 5% cut in energy use combined with a 5% rise in the amount of energy we produce. We are going to deliver these targets by, for example, installing solar panels at our closed landfill sites and speeding up the process of replacing power-hungry equipment with newer and more energy-efficient solutions.

**Let's talk about the circular economy: how has it become an ecological and economic issue as well as a geopolitical and strategic tool?**

**P. C.:** Recycling, and waste management more generally, are no doubt a strategic challenge facing Europe, and even more so in 2023. For example, we are currently drafting product eco-design regulations. Products are far more recyclable and recycled if this is designed in from the start. Speeding up progress in this area limits costs and promotes circularity. It is also important that we set standards for every product we encounter in our day-to-day lives, gradually enforcing rates not just for recyclability but for actual recycling or reuse: these are not opposing concepts. In Europe, the upcoming legislative program will set new rules that will be among the most ambitious anywhere in the world.

**E. B.:** The circular economy is a response to a critical challenge: the scarcity of natural resources such as water, a number of ▶

## Appointment

metals, and raw materials in general. Energy transition, to take one example, requires nickel, cobalt and lithium, which we need for batteries and other machines. Almost half of all lithium comes from China, the rest from Chile. Nickel comes from Russia, cobalt from Congo, and so on. The circular economy is one of the ways we can tackle this dependency. We need to mine resources from the waste we produce here, in turn shortening supply chains. It would be hard to use recycling to replace all the lithium we currently import, but it can help balance the scales. This is a field where innovation is key: we are currently investing in a plant for recycling electric vehicle batteries near Metz, in eastern France. This is a first: after years of R&D in hydrometallurgy, we are proud to have perfected a process for separating and purifying streams of strategic metals such as lithium, cobalt and nickel from batteries.

**P. C.:** This is an area that lies very much at the intersection between innovations, which are your responsibility as an industrial company, and setting the rules of the game, which is a matter for policymakers. Dialogue between both sides means we are on track to succeed in building a European industry for recyclable batteries. We're now catching up after a slow start and should be in a position to emerge as the world's number two battery-maker, behind China.

### **What are the must-have ingredients for a successful ecological transformation?**

**E. B.:** Our experience as the leader in environmental services tells us that for it to work, commitment from everybody is absolutely crucial. There are also three conditions that need to be met. First, there have to be bans in place to clamp down on pollution and prevent a free-for-all where anything can be dumped anywhere. Next, there needs to be a commitment by major groups like Veolia to invest in the technologies they need to decontaminate and recycle. Lastly, there has to be demand from sectors that will take recycled products and use them in remanufacturing. In Europe, this demand is triggered by the requirement to include recycled materials in new manufactured products. However, businesses in certain areas of the economy are worried about becoming uncompetitive in the face of products not subject to similar environmental standards.

**P. C.:** President Biden's 2022 plan, the Inflation Reduction Act (IRA), shows otherwise. It signals the start of real competition between us – basically the Europeans, Americans and Chinese – in the battle to localize value chains, technologies and decarbonized industries. The Americans have 400 billion dollars earmarked exclusively for rolling out decarbonized manufacturing on their home soil, money to be used for producing green hydrogen, electric vehicle batteries and zero-carbon steel. In Europe, we are taking a similar approach with the Green Deal and national stimulus plans, as are the Chinese with their own methods. The battle is underway, with extremely large sums of money being invested. Having some form of competition between us is the only way to win the climate war. The race is on and we need to be among the pacesetters. The European response we are in

the process of putting together aims to simplify, accelerate and provide more help, where needed, and to expand investment capacity on our continent. The shift to decarbonization is heading in the right direction for re-industrializing France and some parts of Europe.

### **Let's end with a look at water stress and climate. Summer is fast approaching and there is a sense that a number of countries are facing a critical situation. So, why are there so many restrictions on the reuse of wastewater?**

**E. B.:** Last summer marked the moment when France came to the collective realization that water is a precious commodity – something already understood in other parts of the world. This is another area where our solution is built around a mixture of responses, including wastewater reuse, which offers significant potential. In France, less than 1% of wastewater is recycled; in Spain it's 15%, Italy 7%, and Israel 85%. We have the technologies and resources to roll out our solutions at scale very quickly. And we have already seen a number of significant successes: in California, the Mediterranean basin and Jordan, where we provide 10% of the country's irrigation water in the form of reused wastewater. In short, it's now time to accelerate.

**P. C.:** On this topic, the European Commission presented a proposal for a revised wastewater treatment directive last fall as part of the Green Deal. Personally, I favor the obligation or ability to use wastewater within a secure legal framework and with the aim of increasing its use, but this did not feature in the initial proposal.

**E. B.:** That's such a shame! Objectively, there are no health or technical obstacles: we know how to reuse water and there is a desperate need for it. Resistance to reusing wastewater results from a failure to understand the seriousness of what is at stake and how history is accelerating. Last summer saw a collective realization that we have to take action. In terms of supposed health risks, we have 20 years of experience backed up by scientific and medical proof. There are no health risks provided that protocols are properly applied and followed. Water is rightly one of the most rigorously controlled industries. The time for action is now. For example, Veolia France has rolled out a pioneering initiative to implement and expand wastewater reuse by installing compact wastewater recycling units at every sewage plant where it is possible. It's a step in the right direction. Now we need to pick up the pace and move to scale.

**P. C.:** If change is to happen, it has to be through legislation and the topic has been under discussion at the EU level since the Commission's presentation last fall. I will work tirelessly in the European Parliament to ensure that we can establish a secure framework for wastewater reuse, possibly involving mandatory targets, so that we gradually increase the percentage of water that is reused and it becomes normal to recycle and reuse this water. ▀

**“I will work tirelessly to ensure that we can establish a secure framework for wastewater reuse, possibly involving mandatory targets, so that we gradually increase the percentage of water that is reused.”**

**Pascal Canfin**



**Listen to this conversation  
in the podcast in French  
“Ecological transition,  
dialogues with agents  
of change”**





AN

# Meet Veolia employees around the world

Anas, Fabrizio and Michelle are part of a community of 220,000 Resourcers who “want to shape the world into what it could be.” Optimistic, determined, always together, they don't give up on ecological transformation... They are part of a series of portraits to follow on [veolia.com](http://veolia.com).

## Anas

Head of the maintenance department at the As Samra wastewater treatment plant

A Jordanian success story. This is how Anas sees As Samra, the country's largest wastewater treatment plant. He is not exaggerating: the Kingdom of Jordan is one of the most water-scarce countries in the world, and the As Samra plant manages to treat almost two-thirds of its wastewater. It supplies 25% of the country's agricultural water needs, as far as the Jordan Valley further downstream. In such an arid environment, recycling wastewater is critical, as Anas is keen to stress. “Using it to irrigate farmland gives wastewater a second life, and in this way we help our economy to grow, with positive impacts on nature, food production and public health. It's an honor to contribute to an activity that is so vital to my country,” explains the mechanical engineer who, for the past 15 years, has worked at the giant plant, scaled to meet the needs of over three million users.

Located in the Greater Amman Area, home to 60% of the Jordanian population, the As Samra plant uses advanced effluent treatment solutions that demand the very highest operational and performance standards. This is where Anas and his teams play a vital role: they are in charge of maintaining the site's electrical and mechanical equipment. “Our task is to use the best technical and scientific procedures to transform wastewater into a new resource, with zero risk to health.” Pumps, fans, turbines, generators and odor suppression systems are subject to rigorous monitoring, coordinated by Anas. The task is made even more complicated by the fact that the plant also contains water purification installations and generates most of the power it needs by producing biogas and electricity.

Anas is convinced that the As Samra site is emblematic of Jordan's determination to deliver ecological transformation, and that its activities help raise environmental awareness among the country's citizens. “I find it deeply motivating to work on this project as part of a team united by trust and mutual respect. My goal is to continue working on such an exemplary operation, a standard-bearer for Veolia and for every country where access to water is as difficult as it is here.” ▶

**Listen to Anas tell his story**



# “Our performance allows Udine’s hospital to heat part of the city.”

## Fabrizio

Project Leader at the Santa Maria della Misericordia hospital site

Fabrizio cannot hide his enthusiasm when he talks about the technology center that runs the hospital site in Udine. “This is an ecological transformation project unlike anything else in Italy!” explains the project leader, who has worked for Veolia for over 20 years. “I am proud to play my part in it, making sure that vital services are provided while also helping to protect the environment.” There is a lot of work involved, which is not surprising once you realize the scale of the task entrusted to Siram Veolia: to improve energy efficiency at the site and develop an 11-kilometer heating network for the northern part of the town. Veolia’s Italian subsidiary met the challenge by building a high-technology complex at the heart of this 1,000-bed hospital site featuring a power plant, cogeneration plant and cooling plant, all controlled via an advanced Hubgrade smart monitoring solution.

“This means that the Santa Maria Della Misericordia hospital not only meets its own needs for energy, air conditioning, heating, and the steam used to sterilize the rooms; it also provides heating and hot water to 20 schools and universities and

around 2,000 homes,” says Fabrizio. “The results are everything we could have hoped for, with the installation delivering primary energy savings of 15%, while avoiding the emission of 5,629 metric tons of CO<sub>2</sub> every year (-30%).” Fabrizio’s role as project leader means he is responsible for keeping this virtuous system running with the help of smart monitoring of equipment and detailed reports on activities at the hospital: “The digital services provided by our Hubgrade solution mean we can also measure energy use and carbon emissions with a very high level of accuracy. Our goal is to tailor this in-depth check-up so that it can be used as part of hospital expansion projects, while helping staff in the various buildings to adopt a frugal approach to energy use.”

As a team leader with the support of a group of highly qualified colleagues, Fabrizio relishes the task of responding directly to the needs of the hospital and nearby community. “I’m delighted to know that, thanks to the solutions we provide, we contribute to the patients’ wellbeing and the efficient running of the hospital,

which can be confident that its units are operating optimally. When I hear people I know saying how satisfied they are after visiting one of the hospital’s wards, I feel like I really have made a difference in my own little way. Working on a pioneering project like the one in Udine is extremely inspiring; it encourages me to keep stepping up my efforts as part of a group committed to the planet’s future.” ▶

**Listen to Fabrizio tell his story**





**RIZIO**



VEOLIA

VEOLIA

MIC

# “Water is much too precious to not be recycled.”

## Michelle

Laboratory Manager at the Edward C. Little wastewater treatment plant in West Basin

As somebody who grew up in Los Angeles, Michelle knows all too well that California is one of the U.S. states that was hit the hardest by drought. With the City of Angels’ population growing all the time, preserving its drinking water resources is a massive challenge. Reusing treated wastewater is a sustainable solution used with success at the Edward C. Little treatment plant – where Michelle works as Laboratory Manager – to meet the needs of its approximately 300 customers. As she explains, “some of the wastewater we treat is used to water nearby parks and green spaces.” West Basin Municipal Water District, one of the largest in California, also relies on Veolia’s technologies to produce ultra-purified water used as a barrier to protect local aquifers from saltwater intrusion. In addition, the plant provides services to local petrochemical companies, an industry that makes intensive use of process water and cooling water. “All in all, we offer five different standards of treated water depending on customers’ specific needs,” says Michelle as she describes this custom recycling process.

Every day, her laboratory focuses on monitoring purification processes and equipment maintenance. “We collect and process samples to check that wastewater recycled at our plant presents absolutely zero danger,” she continues. Michelle has always been fascinated by chemical analysis: she began her career in the pharmaceutical and cosmetics industry before joining the West Basin site team. She is a firm believer in the value of her work: recycling wastewater is one of the keys to changing patterns of water use and making sure drinking water is only used for human consumption. “In California, where water stress has been a reality for years, we have to use every means available to preserve our drinking water – too much of it still ends up being used to water gardens and wash cars.”

This is a message that Michelle takes extremely seriously; she has become an enthusiastic ambassador for protecting drinking water resources. “Although I focus mostly on municipal and industrial uses, my job has made my friends and family far more conscious of their own water use and encourages them to do more to save water

and the planet,” she concludes. As a mother, she hopes that future generations will benefit from her work to improve how local water resources are managed. ▶

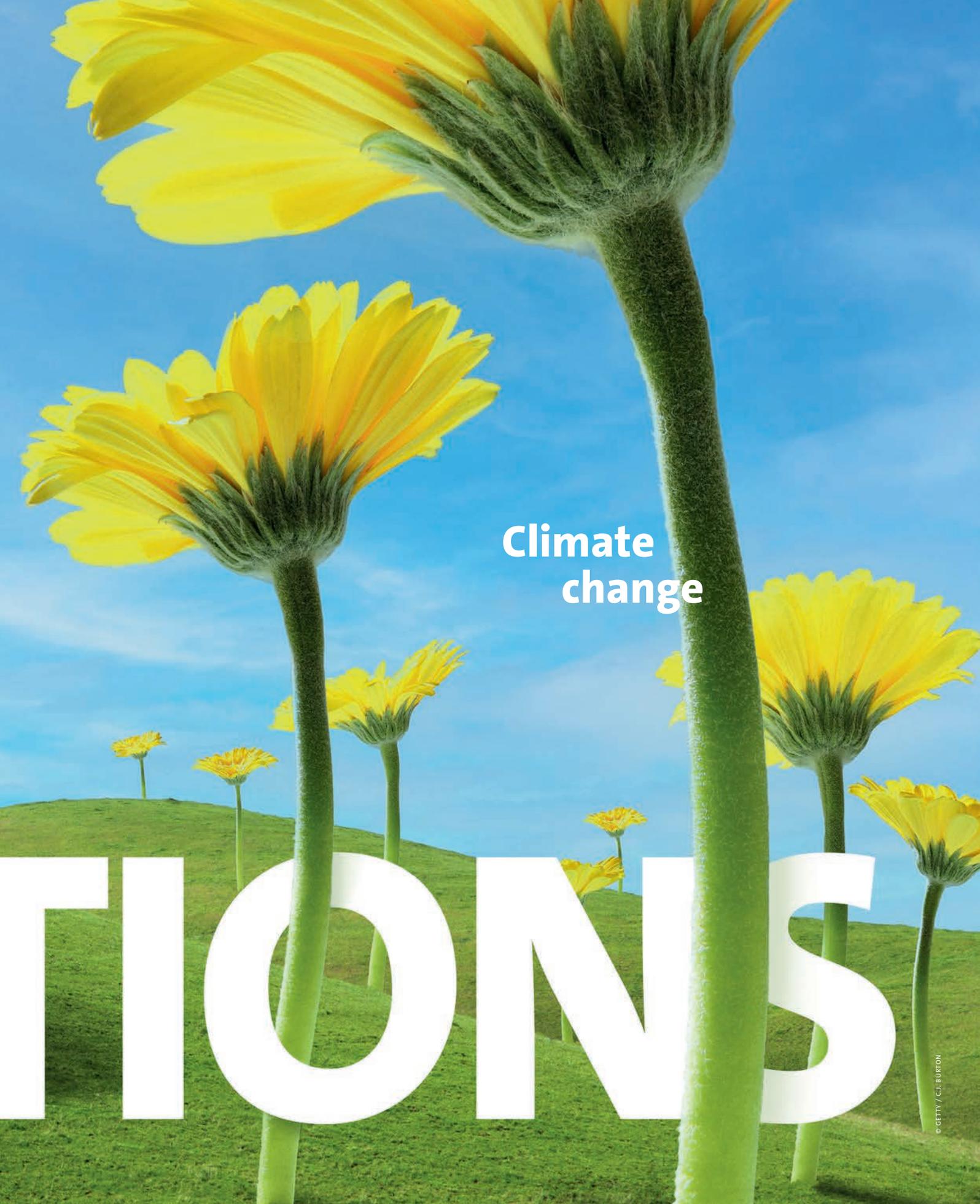
**Listen to Michelle tell her story**



Focus



**SOLUTION**



Climate  
change

TIONS



# TREAT- ING & PREPARED- NING

## **Water: new uses to improve sharing**

Droughts are becoming increasingly common, even in winter, according to the latest report from the Intergovernmental Panel on Climate Change (IPCC). Furthermore, this pattern has been confirmed by UN warnings. Aquifers in southern countries have been facing ongoing water shortages for several years, and regions relatively spared thus far are now affected, such as those in the south and east of the European Union and in North America. Solutions, however, exist: as awareness of the issue becomes widespread, Veolia is stepping up its efforts throughout the world to anticipate needs, avoid shortages, and manage water use conflicts.

## Key figures

**83%** of French people

are in favor of reusing wastewater to produce potable water, which they say they are willing to drink (survey: The French Population and Wastewater Recycling, ELABE, June 2021)

**320** million cubic meters

of water saved by Veolia in 2022 (compared to 2019) thanks to improved network efficiency

**989**

million cubic meters of recycled water produced by Veolia in 2022

**4** pillars crucial

to the success of wastewater recycling projects: technology, acceptance by local people, the regulatory aspect, and the financial aspect

## Issue at stake

Ensure and maintain access to water in the face of climate change.

## Objective

Find solutions adapted to local contexts, communities and cultures, which vary according to geographical areas.

## Veolia solution

Continue to develop solutions that have already proven their effectiveness and duplicate them.



## Jacky Dallet & Yannick Moreau

Jacky Dallet is the president of Vendée Eau, the public water supplier in France's Vendée department, which initiated and now pilots the Jourdain project. Unique in France, the project concerns the reuse of treated wastewater. Yannick Moreau is the mayor of Les Sables d'Olonne, the town that houses the refining unit and supplies it with wastewater.

### What does the Jourdain project involve?

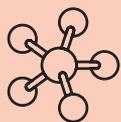
**Jacky Dallet:** We're going to do something here that no other region in France or in Europe has dared to do. The aim of the refining plant that Veolia is building is to produce very high-quality water from wastewater. So when it leaves our treatment plant, rather than being discharged into the sea, the water will be fed back into the natural environment or into a drinking water reservoir before flowing back into the distribution network. In other words, a shorter water cycle. Beyond the guaranteed volume of water, our goal, working with our partners (the Loire-Bretagne water agency; the Vendée department; the Pays de la Loire region; the European Regional

Development Fund; French actors FNADT, DDTM, and ARS; the metropolitan area of Les Sables d'Olonne; and others), is to demonstrate the effectiveness of this kind of process by producing water of perfect sanitary quality. Other towns in France are interested in implementing similar projects in their area.

### What are the consequences of global warming in your town?

**Yannick Moreau:** As for all seaside towns, the main consequence is the rise in sea levels, which increases the risk of coastal flooding. However, in Les Sables d'Olonne, it's not so much global warming that's impacting our water resources.

It's more the absence of a groundwater table that's causing growing water stress. The Vendée is one of the most sensitive departments to periods of drought, as it is 90% dependent on surface water accumulated in reservoirs, which in turn are highly sensitive to global warming. Between population growth and tourism, we need to find alternatives. Last summer, for example, we were able to benefit from water from the Mervent forest, over 80 km away from us. The problem is that in 10 or 20 years, we risk reaching a breaking point. This is why the Jourdain project is so important for Les Sables d'Olonne to prevent this from happening. ▶



## Tracking down PFAS in water: the USA on the frontline

Potentially harmful chemical contaminants are a sensitive subject, especially per- and polyfluoroalkyl substances (PFAS), which are present in many products because of their properties: non-stick, anti-stain, waterproof, greaseproof, high-temperature resistant, etc. They are among the numerous molecules that can be found in water. These contaminants are part of an insidious and constantly changing form of pollution, complex to detect and analyze. This is a major

challenge for Veolia. "The United States has been a pioneer in the regulation of PFAS, which is still evolving," confirms Karine Rougé, CEO of Municipal Water for Veolia in North America. Additionally, on March 14, 2023, the White House announced the proposal of the first national drinking water regulation on the subject, which could take effect as early as the end of 2023. If the rule is finalized as proposed, water utilities will be required to monitor six PFAS compounds in drinking water and

provide treatment if regulatory limits are exceeded. "Veolia in North America deploys an end-to-end solution for PFAS management. We measure PFAS compounds in water, test and design permanent treatment systems, remove specific PFAS molecules from water with activated carbon and ion exchange resin absorption processes, and determine the best disposal option for spent materials. We are also investing in R&D to find the ideal combustion conditions to improve the efficiency of their removal. We

operate 12 municipal drinking water plants with PFAS treatment systems in America and have dozens more active projects underway, but we need to think much bigger and go much faster. That's why we're keeping a close eye on what is happening around the world in this field. Veolia has the technical capability to treat certain of these pollutants in water right now, and this expertise will be extended to more and more countries, especially in Europe, as regulations evolve." ▶

# A

consensus is taking shape. Record droughts recorded in France last winter, with a precipitation shortfall of 25% in one quarter and 75% in February alone,<sup>1</sup> have put the subject of water back in the spotlight. On March 20, 2023, the IPCC published a report confirming that climate change has already impacted access to water, including significant consequences for agricultural productivity. This phenomenon in turn affects the various sectors dependent on agricultural activity, such as food, health, economic activity, and biodiversity. Then, on March 22, 2023, the UN sounded the alarm at a conference on water – the first since 1977 – where it launched an action program. UN Secretary-General António Guterres made the program’s purpose clear: “Let’s take the next steps in our journey to a water-secure future for all.” Finally, on March 30, 2023, French President Emmanuel Macron unveiled his “Water Plan”: 53 hard-hitting measures to conserve water and improve how we use it. The plan’s goals include 10% savings and 10% reuse of treated wastewater by 2030.

The figures suggest the possibility of a global crisis. Today, between two and three billion people face water shortages for at least one month per year. Two billion people worldwide do not have adequate access to drinking water.

## MULTI-PURPOSE REUSE

Pierre Ribaute, CEO of Veolia France Water Zone, confirms that we are at a crossroads: “We have entered a new era, where the effects of climate change are increasingly perceptible in our lives. Contrary to what we have always thought, especially in France, freshwater is not an unlimited renewable resource. In early February 2023, a Drought decree was issued in France for the southern Bouches-du-Rhône area: an unprecedented action, showing that exceptional circumstances were becoming the norm. For many international observers, France continues to lead the way in water management. The know-how, the solutions and the technologies are proven and available. They can prevent us from living with a sword of Damocles hanging over our heads.”

**“ For many international observers, France continues to lead the way in water management. ”**

**Pierre Ribaute**

Veolia is already applying this expertise around the world and in France (see the testimonies of Jacky Dallet, president of Vendée Eau, Vendée’s public drinking water supplier, and Yannick Moreau, mayor of Les Sables d’Olonne, in the box). The Group’s vision is based on three pillars: “We’re in a period of adaptation,” points out Geneviève Leboucher, Senior Vice President, Access to Water and Sanitation, and Yvan Poussade, Senior Process Engineer working on treated wastewater reuse. “The first pillar of good water management is conserving the resource, which means that we have to fight against pollution, especially micropollutants such as PFAS or drug residues,” explains Geneviève Leboucher. “The second represents a better use of the resource by avoiding excessive water use, which is achieved by upgrading any aging networks and adopting more conscientious water use habits. The third is access to alternative resources, such as treated wastewater reuse or seawater desalination.”

The Edward C. Little Water Recycling Facility in West Basin (near Los Angeles) is a perfect example of adaptable wastewater recycling. For several decades, the plant has been meeting high demand for water supply, particularly due to the growth in tourism and industry in California. As early as 1994, Veolia implemented a solution that resulted in the

production of five grades of water for irrigation, cooling water and process water for petrochemical plants. “In the final stage, the treated water is used to recharge the aquifers, which act as a hydraulic barrier to prevent the infiltration of seawater, a process that occurs after many years of overexploitation. Some 150,000 cubic meters of reusable water are produced daily at West Basin,

a figure that’s constantly on the up,” says Yvan Poussade, who knows that the Golden State needs plenty of support if it is to meet its objective of 100% reusable wastewater by 2035, especially now that discharging wastewater into the ocean is increasingly prohibited.

## FROM RECHARGING TO DRINKING WATER PRODUCTION

In Spain, the El Prat de Llobregat regeneration plant near Barcelona has been a benchmark since its inauguration in 2006. “Here, too, the aim is to recharge the aquifer to combat groundwater contamination. In addition to bringing potential environmental benefits, the recovered water is fed into the secondary network, for example, to irrigate public spaces or clean streets,” adds Geneviève Leboucher.

Change of scenery and context: between the Kalahari and Namib deserts, the latter being the oldest in the world, the city of Windhoek has seen its population grow for decades, reaching 431,000 in 2020. With no river nearby and standing over 250 km from the ocean, Namibia’s capital city has been facing droughts, the occurrence of

1. Source: Météo-France public weather service

## Focus

which has been on the rise since the 1950s. This situation prompted the authorities to create a drinking water production plant using the city's wastewater in 1968. A world pioneer with the Direct Potable Reuse process, the municipality expressed the need to modernize its site and increase its capacity in 2001. Site management was then entrusted to the Wingoc consortium, made up of Veolia and the Australian-Indian company Wabag. "Windhoek is a unique case, but it could certainly set an example," notes Yvan Poussade. "Take, for example, Texas and Colorado. Like California, both are in the process of legislating to do the same thing." A logical choice, given

that the current plant, with its 21,000 cubic meters of drinking water produced each day, quenches the thirst of up to 35% of the population. A proportion that will inevitably increase in the coming years, since construction of a second plant was given the green light last January.

West Basin, El Prat de Llobregat, Windhoek: all examples that could be duplicated in the years to come. "Taking into account the specific local conditions, of course," concludes Yvan Poussade. Here too, a consensus is emerging. ▶





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**“The Edward C. Little WWTP produces 5 different water quality grades, including up to 150,000 m<sup>3</sup> daily of treated wastewater used to recharge the aquifers, which act as a hydraulic barrier to prevent the infiltration of seawater.”**

Yvan Poussade



# OPPOR- Energy: regions in a time of TUNNITIES decarbonization

Keeping in line with international climate objectives, Veolia is stepping up rollout of its energy solutions to limit its own carbon footprint as well as that of its customers. From France to Australia, and from the Czech Republic to Brazil, several initiatives are in place that are meant to strengthen on a local level the Group's position as a leader in the production of "decarbonized and decarbonizing" energy.

# TIVES

## Key figures

**44**  
millions MWh  
of energy produced  
by Veolia in 2022

**14** million  
metric tons of CO<sub>2</sub>  
saved by Veolia for its clients  
in 2022

**680**  
heating and cooling  
networks operated  
worldwide

**25** km of network  
automatically controlled 24/365 and  
a combined heating/cooling capacity  
of over 50 MW in Paris-Saclay

**6,000** hectares  
of surface area on the Woodlawn Eco  
Precinct site managed by Veolia in Australia  
and New Zealand

## Issue at stake

Reduce the production of  
greenhouse gases and use the  
levers of decarbonizing energy.

## Objective

Align with national legislation  
to move toward carbon  
neutrality (planned for 2050  
in Europe).

## Veolia Solution

Continue to innovate, make its  
skills and talents available to  
its customers and partners, and  
adapt tried-and-tested projects  
for use in new areas.



## 3 questions to Marc-Olivier Houel

CEO of France Waste Recycling & Recovery Solutions Zone

### What is the advantage of solid recovered fuel (SRF)?

**Marc-Olivier Houel:** SRF is made using waste that cannot be sorted any further at sorting centers and is destined for landfill. When this remaining material is incinerated, it produces heat and steam which, through cogeneration, can become electricity. Veolia's aim is to develop an effective energy-recovery processing activity for this waste, which cannot be recycled as recovered material.

### How did the Dombasle Énergie project come about?

**M-O.H.:** It's the result of the encounter between Solvay's desire to maintain operation of its soda ash site – along with its one thousand direct and indirect jobs – in a context where high-carbon activities are heavily taxed, and our commitment to finding the best solutions to comply with legislation which, in France, calls for a 50% reduction in landfill waste by 2025. In this case, our solution was an SRF boiler. As soon as it is commissioned in October 2024, 350,000 metric tons of SRF – which we guarantee to be 50% biogenic

– will be used instead of coal each year. This will save 240,000 metric tons of CO<sub>2</sub> over the same period.

### Is this unit duplicable?

**M-O.H.:** Not all projects will be on the same scale. But our aim is to decarbonize the industry by creating more and more boilers like the one for the Dombasle Énergie project, which is the first of its kind in France. The promise of a win-win partnership for our industrial customers. ▶



## Val'Pôles, flagship industrial ecology sites in Île-de-France

Together, the two non-hazardous waste storage sites of Claye-Souilly (289 hectares) and Plessis-Gassot (325 hectares) could cover more than 900 soccer pitches. Operated by Veolia's subsidiary Routière de l'Est Parisien (REO), they have become the leading producers of green energy in the Paris region, each hosting several facilities for the production of electricity, heat and gas from biogas, produced by ultimate landfill waste.

The Val'Pôles, as they are known, are exceptional industrial sites

and circular economy showcases, supporting the region's economy and energy independence. A winning bet, the Val'Pôles contribute to the production of 17% of the renewable electricity in Île-de-France, supplied to the national operator EDF's grid. As for heat, it is recovered in a heating network in the towns of Goussainville and Le Plessis Gassot. Produced gas is injected directly into the distribution network operated by GRDF, to supply individuals and businesses in the region for their traditional uses, and

also to decarbonize the transportation sector, thanks to BioNGV.

The Val'Pôle Claye-Souilly biomethane production unit produces 120 GWh of renewable gas annually, approximately the consumption of 20,000 households. The project contributes to the energy security of the region, offering a local, sustainable and low-carbon energy source. However, the Val'Pôles are committed to reducing the landfilling of final waste, resorting to it only in the absence of alternatives. In

accordance with the French "Energy Transition Law for Green Growth" (LTECV), the waste received, mainly from companies and industries (cardboard, wood, materials, biomass, tires, etc.), is primarily directed toward recovery platforms producing new recycled raw materials. This way, Val'Pôle units meet several objectives: identifying and industrializing new technological solutions for sorting and recovering waste; accelerating the commitment to support biodiversity and the agricultural sector. ▶



Deal on the Climate Law! Our political commitment to becoming the first climate-neutral continent by 2050 is now also a legal one. The Climate Law sets the EU on a green path for a generation. It is our binding pledge to our children and grandchildren.» Published on April 21, 2021, this historic tweet from the European Commission set the pace for actions to be taken by member states, with its target of reducing greenhouse gas emissions by 55% by 2030 (with 1990 as the baseline year). Two years later, almost to the day, Veolia officially launched GreenPath Zero Carbon, demonstrating clearly its determination to support its municipal, service sector and industrial customers on the road to decarbonization. Approximately one hundred solutions reinforce the Group's objectives for its water, waste, and energy activities. 80% of the solutions already exist (energy efficiency, fuel switching, etc.) and 20% are innovations (carbon capture, utilization and storage – CCUS, green hydrogen, etc.). “With GreenPath, we are making our international expertise available to stakeholders wishing to transform their business models in a sustainable manner,” says Veolia Chief Executive Officer Estelle Brachlianoff. “It is our responsibility to propose alternative paths, from decarbonization and pollution treatment to frugality and resource regeneration.”

**FRANCE SETS THE EXAMPLE...**

These are sensible points in the midst of an energy crisis, at a time when the French government is encouraging companies to reduce their consumption. Hence the radical plan unveiled by Veolia in September 2022: reaching energy self-sufficiency within five years for its water and waste services. An approach that demonstrates the feasibility and relevance of generalizing ecological transformation solutions, responding to the challenges of energy sovereignty and decarbonization in France. These messages were used by Veolia to win a tender in early 2023 for operating a fifth-generation heating and cold exchange network on the Paris-Saclay urban campus. Unique in Europe, the facility relies on an ambitious energy mix combining deep geothermal energy,

waste heat from the CNRS supercomputer, and heat recovery from the cooling network. It will be based in the regional flagship scientific and technological site located south of Paris, home to 15% of France's scientific research. The planned installation is designed to strengthen production infrastructure and optimize and diversify the energy mix. The expertise of Veolia's teams will double the network's capacity by 2028, with an annual output of over 100 GWh of heat and 20 GWh of cooling, equivalent to the yearly consumption of 10,000 homes.

“At Veolia, the ecology of solutions consists in using decarbonization possibilities that currently exist,” says Estelle Brachlianoff. In eastern France, Solvay's soda ash plant at Dombasle-sur-Meurthe benefits from a decarbonization program based on the installation of a solid recovered fuel (SRF) cogeneration unit (see box). The Dombasle Énergie project, in partnership with the Belgian chemical giant, was given the go-ahead in February 2022. It aims to replace three coal-fired boilers with a boiler plant equipped with a two furnaces running on SRF, with the objective of halving its carbon emissions.

**...BRINGING EUROPE IN ITS WAKE...**

Further east, Veolia is committed to eliminating the use of coal in the power plants it manages in Central and Eastern Europe by 2030. It will require an investment of more than €1.5 billion over the coming decade, with an overall reduction of 2.7 MtCO<sub>2</sub>e. In the Czech Republic, for example, the Group operates several district heating networks for

its municipal customers, including those on the right and left banks of Prague and in major cities such as Ostrava, Karviná, Havířov, Frýdek-Místek, Olomouc, Přerov, Nový Jičín, Krnov, Kolín, Vlašim and Mariánské Lázně, representing over 1,500,000 residents supplied with heat throughout the country.

**Richard Kirkman**

And, specifically in Kolín, the use of fossil fuels is nearly over: starting in 2023, the conversion

of a coal-fired boiler to biomass, fueled by wood chips, will mark the definitive end of coal use. This operation benefited from funds from the European Modernization Fund<sup>1</sup> that were granted to the state and aim to promote ecological district heating, giving priority to renewable energy. Eventually, the Kolín network will operate on an energy mix composed of 85% biomass and 15% gas, with the possible use of SRF. This change in direction will make it possible to supply heat to 23,000 residential customers or an entire hospital.

**“The Woodlawn Tarago Ecosite is the finest example of a successful ecological transformation.”**

1. The Modernization Fund is a European Union program that aims to assist 10 low-income EU countries (Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, the Czech Republic, Romania and Slovakia) in achieving their climate neutrality goals by helping modernize their energy systems and improve energy efficiency.

### ... AND THE REST OF THE WORLD FOLLOWS SUIT

On the other side of the planet, “Australia has turned the spotlight on ecological transformation and Veolia is ready to shine,” says Richard Kirkman, CEO of Veolia in Australia and New Zealand. The Woodlawn Eco Precinct in Tarago (north of Canberra), where Veolia has been processing nearly 40% — or 1 million metric tons annually — of Sydney’s waste for the past 15 years, is a perfect example. Built on a 6000-hectare former open-pit mine (copper, lead and zinc), Veolia is using its operations to rehabilitate the environment back to its original condition. It is a showcase for the circular economy, lying at the heart of a network of interconnected ecological projects: biogas captured from the decomposition of landfill waste, reuse of organic matter (100,000 metric tons of organic waste), production of clean energy generated by the bioreactor, incorporation of a neighboring farm applying rotation of nutrients and pastures to sustainably manage the site, and capture of residual heat to develop a fish farm that grows nearly four metric tons of barramundi — sold to restaurants in the nearby capital city of Canberra. 2,500 solar panels provide all the site’s clean energy needs, while the output from a wind farm with 23 turbines, each producing 2 MW, feeds power into the New South Wales electricity grid. “It’s the best example of a successful ecological transformation,” says Richard Kirkman, adding, “It’s on the back of these achievements that we plan to expand our business and replicate our projects in other locations across Australia.”

A different continent, but with similar problems: in Brazil, half of the 80 million metric tons of waste produced each year ends up in one of the country’s 3,000 illegal and therefore uncontrolled landfills. To provide solutions to this ecological crisis, for the past two years, Veolia has been operating three new power plants at the waste processing units in Iperó, Biguaçu, and São Paulo. The result is 12,400 kW of renewable electricity generated from the biogas produced by the organic waste at the waste management centers. This will cover the electricity needs of a city with a population of about 42,000.

All these examples could eventually be duplicated in other geographical areas. Veolia is directing its efforts toward this replication and dissemination approach as it rolls out proven solutions for ecological transformation. ▶



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**To eliminate coal from the power plants it manages in Central and Eastern Europe, including those in Prague, by 2030, Veolia has an investment plan of more than € 1.5 billion over 10 years.**





# (RE) SOURCE

## **Recycling: strength in materials**

Saving and regenerating resources is a new focus in the drive for ecological transformation. The solutions already implemented show that, in addition to “doing less,” it is also possible to “do more and better, with less.” Veolia is part of the movement toward producing more goods using fewer raw materials and less energy: for an even more sober energy-conscious and circular world.

## Key figures

**490** kt

of plastics recycled worldwide in 2022, 40% more than in 2019

**40**

the number of high-performance plastics recovery plants Veolia provides for its customers worldwide

**4,000 to 7,000**

metric tons/year of black mass treated at Veolia's new electric battery treatment center in Moselle (France)

## Issue at stake

Make better use of deposits in “urban mines” to secure a sustainable supply of critical raw materials for the EU.

## Objective

Accelerate circular solutions for the recovery of plastics and strategic metals from electric batteries at end-of-life.

## Veolia solution

Leverage its head start in R&D and the combination of expertise with existing projects to offer customized solutions for its industrial customers.



## 3 questions to **Éric Trodoux**

Senior Vice-President, Solid Waste Recycling & Recovery at Veolia Group

**In what way is Veolia’s vision of transformative innovation a solution for the future?**

**Éric Trodoux:** At Veolia, the sum of the businesses – waste, water and energy – forms a unique combination. This is a definite advantage for the Group, which is now capable of providing both services and added value to local players as well as major industrial companies all over the world. And waste? It is and will increasingly be a resource used to produce energy or new materials. Organic waste notably opens the door to the mass production of biogas and fertilizer, which also involves the recovery of sludge.

**What role does R&D play in this context?**

**E. T.:** It provides high added value, and is part of our DNA. If this DNA is to grow, it will have to extend beyond our borders to every continent in order to seize on new ideas. CO<sub>2</sub> capture and recovery, technology watch, extraction of non-ferrous metals, formulation of new recycled plastics for the automotive or textile industry (manufacture of dashboards, etc.): there are plenty of avenues to explore. Veolia has the know-how and the drive to accelerate the transformation of our energy and environment sectors.

**What glass ceilings will Veolia have to break through to achieve this goal?**

**E. T.:** First of all, the fiscal regulation and applicable standards concerning recycled materials need to be rethought to make them more competitive with virgin materials derived from oil. For our part us, the challenge will be to retain, train and recruit smart hands, the technicians on the ground who make our projects happen. Without them, there’s no point even thinking about tomorrow’s strategies. ▶



## PLASTILOOP by Veolia

Waste that is more and more difficult to relocate and the will to ensure that it does not have to travel thousands of kilometers: by combining networks of experts with Veolia’s many years of experience, PlastiLoop meets the needs of Veolia’s industrial customers for a wide range of

applications, all adapted to the most stringent market standards. PlastiLoop provides them with a broad variety of recycled and ready-to-use resins (PET, HDPE, PP, PS, ABS, LDPE, and PC), opening the door to production lines in sectors as diverse as packaging, textiles, agriculture, furniture,

household appliances, automotive, logistics, and building/construction. This should reduce the environmental footprint of companies while enhancing the quality of their products. Presented at the K 2022 trade fair, the PlastiLoop platform is, according to Estelle Brachlianoff, Veolia’s Chief

Executive Officer, “an opportunity to put the Group’s strengths to good use. As the global champion of ecological transformation, Veolia has developed this solution to create more outlets for recycled material and encourage the structuring of this sector at a global level.” ▶

# D

dependence on imports, loss of mineral sovereignty in certain regions, relocation of extraction and processing activities to countries where prices seem as low as their level of environmental concern: the world is facing a critical situation where access to strategic raw materials is now a geopolitical and economic issue. How can we ensure the long-term security of supply and the establishment of responsible and sustainable value chains, while at the same time contributing to the re-industrialization of regions or the emergence of recycling centers? For Veolia, the most urgent need is to reintroduce these strategic materials into the production chain. In this high-potential field, the Group has already made its mark – generating €4.1 billion in revenue in 2022 – by developing recovery solutions for its customers. Paper, cardboard, ferrous and non-ferrous metals, fluids, solvents, and sludge are just some of the common or hazardous materials and fluids that Veolia collects and recovers using technologies that require flexibility as well as expertise in traceability.

## PLASTICS IN A LOOP

One illustration of the response proposed at the local level, the creation of material loops, is already paying off. Choosing to recycle plastics saves resources and reduces CO<sub>2</sub> emissions by 75% compared to virgin plastics. As Christophe Maquet, Senior Executive Vice President of Veolia Asia Pacific, confirms: “The use of circular polymers offers advantages that resonate strongly with shareholders, investors, customers, citizens and public authorities.” PlastiLoop was developed with this in mind (see box) as an integrated service giving Veolia’s industrial customers the chance to source recycled plastic resins from anywhere in the world. The main advantage is the range of polymers it offers, structured by application to meet the specific needs of each customer. “Thanks to this personalized approach, we can ensure a reliable supply and provide a performance guarantee that is totally tailored to their products,” explains Christophe Maquet. The result: by 2022, almost 500,000 metric tons of recycled resins had been produced at our PlastiLoop network sites.

## ELECTRIC BATTERIES: A MAJOR CHALLENGE

The boom in the use of electric vehicles poses a different set of problems and calls for new and innovative solutions. While electrification means a reduction in CO<sub>2</sub> emissions, it also raises the question of how to recycle batteries, which are made up of plastics, solvents, electronic parts, and other metals that are dangerous or increasingly strategic: copper, cobalt, nickel, manganese, aluminum, and lithium. The European Union has taken a strategic step by requiring that 50% of the weight of batteries – varying between 300 and 600 kg, depending on the model – be recycled. The proportion of batteries recycled is set to rise gradually, to 65% by 2025 and 70% in the draft European regulations currently under review. This is a necessary step, given that 40% of vehicles are expected to be 100% electric or hybrid by 2030. With three decades of specialist experience in battery processing and recycling, Veolia intends to play a major role in this emerging circular economy sector. In Minworth (England) and Moselle (France), three operational sites are already or will soon be able to process 100,000 batteries – or 30,000 metric tons – each year. Veolia plans to step up the pace and increase this capacity with five additional centers. Particularly valuable rare and strategic metals are also found in electric vehicle (EV) batteries. The batteries need to be dismantled, with the most precise separation possible of their various components. Only then can they be fully processed and recycled.

With ten years of Research & Development under its belt in this area, Veolia has a head start. Its Euro-Dieuze Industrie treatment center in eastern France helps limit the extraction of natural resources while promoting reuse in various industrial applications such as metallurgy (sheet metal, tooling, and specialty steels) and chemicals (manufacture of metal salts and copper and cobalt sulfate).

**“Waste will increasingly become a resource to produce energy or new materials.”**

**Éric Trodoux**

## CLOSED-LOOP RECYCLING SKILLS

The difficulty of accessing the raw materials needed to produce batteries requires specific technology. Veolia and its partners have taken up the challenge of implementing a fully circular model to maximize the recycling of used lithium-ion batteries, from collection to dismantling and including metal extraction and purification. These metals are then treated so they can be fed back into the battery manufacturing process.

The battery is first crushed to obtain a black mass, which is treated by a hydrometallurgical process to selectively extract the various metals: manganese, cobalt, nickel and lithium, and graphite. Next, a chemical refining process brings these critical metals to a sufficiently high level of purity for use in new batteries. A processing center has opened at the Euro-Dieuze site in Moselle (France), which won the Recycling, Recyclability and Reincorporation of Materials call for projects under the France 2030 plan. The center is receiving financial support to set up a

## Focus

hydrometallurgy demonstrator scheduled to come on stream in late 2023 at the neighboring CEDILOR site. This advanced technology can recover the strategic metals contained in used batteries and meet the increased recycling rates set out in the new European regulations on batteries. A second rollout, three times the size, is programmed for 2028. This closed-circuit recycling will help conserve natural resources and generate new drivers of growth and competitiveness in Europe for Veolia. ▶





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**“The use of circular polymers offers advantages that resonate strongly with shareholders, investors, customers, citizens and public authorities.”**

Christophe Maquet

**And tomorrow?**





# Paint me a picture of a transformed world

Are we ready to accept the changes needed to tackle the environmental emergency? To find the answer to this question and sharpen its focus on the ecology of solutions, Veolia partnered with research and consultancy firm Elabe to launch the first Barometer of ecological transformation. This unique global opinion poll revealed some surprising results, particularly regarding attitudes to the acceptability of solutions that need to be put in place.



## And tomorrow?

# F

From IPCC reports and climate strategies to the Green New Deal and COP, there is no shortage of proposals for tackling the climate crisis, biodiversity loss, and pollution. But their large-scale adoption and rollout raise a major question: are the changes needed to wage the battle of the century acceptable to our societies on social, economic and cultural levels? This question is central to the Barometer of ecological transformation. The goal is to reflect public debate in concrete terms by working on solutions and understanding the factors likely to hold back or promote their acceptability in order to speed up the transformation.

### GLOBAL APPETITE FOR CHANGE

The reality of the climate crisis is no longer up for debate: 89% of people worldwide are convinced. The highest numbers, 94-97%, are found in Latin America and Southern Europe. And a handful of more climate-sceptic countries stand out, such as Nigeria (77%), the UAE (79%), the USA (80%) and Finland (81%).

Among climate believers, 75% consider human activity to be the primary cause of climate change, and 71% feel a sense of ecological and climate vulnerability, with the latter rising as high as 87% in Italy! 18- to 24-year-olds are slightly more skeptical, although 69% believe that the climate crisis is happening now AND that human activity is the primary cause, but as a group they also feel less vulnerable than their elders: 61% feel a sense of ecological and climate vulnerability. But eco-anxiety has a strong impact on their daily lives: 34% (compared to 30% of people worldwide) are anxious about the future and unwilling to embark on long-term projects such as founding a family. Only 12% feel there is nothing to worry about.

### INACTION WILL COST MORE THAN ACTION

The time for sounding the alarm about the ecological emergency is at an end: now is the time for action. And yet, the path to follow remains difficult to imagine. Almost 8 in 10 people are convinced that the climate crisis is a serious and immediate risk, and 67% feel that the costs of the consequences of climate change and pollution will

“This is an important tipping point: 67% of the world's inhabitants are convinced that climate inaction will be more costly than action.”

**Laurent Obadia**

Deputy CEO in charge Stakeholders, Communications and of the Africa-Middle East region, Advisor to the Chairman at Veolia.

exceed the costs of investment required for ecological transformation. But they remain optimistic: 60% believe that the future is in our hands. Among the most optimistic countries are Indonesia (90%), India (86%), Nigeria (84%), Brazil (78%) and Colombia (77%). All of them are young, emerging countries that are feeling the full force of the climate crisis. They believe in the power of collective action — involving citizens, states, local authorities and businesses ahead of nonprofits — and 55% think that we need to embrace far-reaching changes to our lifestyles (notably by shifting to greater frugality), as well as implement mitigation technologies. Among young people, there is a sense of fear but not of resignation or impotence. Like their elders, 63% feel that the future is in their hands, whereas 28% are uncertain and only 8% believe that it is “too late.” They feel that the future depends on climate and ecological action, with seven in ten of them certain that inaction will cost humanity more than action.

**And tomorrow?**





**“We need to act  
now and show  
that ecology is  
desirable.”**

**Estelle Brachlianoff**  
Chief Executive Officer, Veolia

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## And tomorrow?

### LACK OF A COMMON FUTURE PROJECT

60% of the world's population find it hard to imagine daily life post-ecological transformation: 24% have no idea what it will look like, while 36% have some idea but find it very unclear. This inability to project into the future is a failure on the part of everyone fighting to protect the environment. One of the causes? Most people (56%) think there is too little discussion of solutions to put in place. 18- to 24-year-olds (57%) share the same difficulty with projecting into the future, and for the same reasons as older age groups: solutions are only rarely discussed. They share a sense of hope, although more cautiously than older people. Younger people, like most of the planet's inhabitants, believe that ecological transformation is synonymous with a "better world." They believe that we will enjoy better health (66%), fewer worries (66%), consume less but better (65%), show greater solidarity (64%), and live more comfortably (63%). But this future is not trouble-free in terms of purchasing power and the fear that they will have to renounce some of their habits.

### PATHWAY TO SOLUTION ACCEPTABILITY

The ecological transformation concerns everybody, and efforts to protect the planet must be shared fairly. It is the level of acceptability that the barometer evaluates, analyzing obstacles and levers in order to speed up the transformation. Six in every ten people worldwide say they are ready to accept most of the changes required by environmentally friendly solutions such as reuse of treated wastewater, biogas, waste material recovery, and recycling. But under certain conditions, shared by every age group: a guarantee that the solution presents no risks to health, or that it contributes to protecting or improving health and quality of life; certainty that the solution is genuinely useful (demonstrating its contribution to cutting emissions, decontamination, and their country's food and energy self-sufficiency); a genuine shared project for the future of society that encourages and motivates people and can garner collective support; and economic and cultural costs that are affordable, meaning that extra costs are shared fairly and changes introduced gradually. Four in ten young people feel that the acceptability of change depends on the speed at which it occurs, particularly in relation to their diet. They are far more concerned than older generations by whether a new practice or lifestyle is adopted by the majority. At their age, social norms are a major lever: 14% admit that the fear of being judged by others might be enough for them to consent to changes that disrupt their lifestyles.

### HEALTH: NON-NEGOTIABLE

Health is the overarching condition for ensuring that solutions are accepted; it is the number one driver for ecological transformation in every country and every part of the world. This means that the pathway to acceptability starts with health: it is the gateway as well as the first obstacle to overcome. And that is not all: proving that an ecology of solutions helps protect or improve health would

be a tipping point for public opinion. Three quarters of the world's population believe that pollution and the direct impact it can have on health is a clear and immediate danger. One in two people state that they would find it easier to accept changes that disrupt their habits or lifestyle if these were shown to help protect or improve their health. For a large majority, delivering ecological transformation necessarily involves acting to protect health: 75% believe that in a post-transformation society, we will enjoy better health, and 69% believe that life will be more trouble-free.

### THREE KEY SOLUTIONS: ENERGY, WATER, WASTE

When it comes to energy, global opinion is ready for a clear shift to action. The climate emergency means that a majority of the world's inhabitants will accept proven decarbonization solutions, such as producing biogas from landfill waste, incineration, and CO<sub>2</sub> capture. 68% declare that they are prepared to live near an energy-producing sewage plant (biomass), 63% in relative proximity to incinerators recovering energy from local waste, and 61% would pay a little extra for energy if it emitted less CO<sub>2</sub> and was "local" in origin.

The same applies to water. People in every country in Europe and Asia are now well aware of the risk of water shortages, polluted farmland and the fragility of ecosystems. 79% of respondents believe that resource scarcity and exhaustion (lack of healthy farmland and drinking water) are serious and immediate risks. To mitigate them, reuse of treated wastewater is widely accepted for agriculture (69%), household tasks (69%) and cleaning (66%). While acceptance of this technique is more guarded for water destined for human consumption, one person in two is nonetheless prepared to drink it. Lastly, circular economy solutions are currently the best known and accepted around the world: an encouraging sign of what can be achieved in a short number of years when public authorities, businesses and private individuals share the same goals. Between 75% and 82% of people are prepared to increase the amount of waste they sort or to buy more products, articles and foods sold in packaging made fully or partially from recycled materials. Uplifts in cost (at purchase, or via levies and taxes) reduce acceptability but are tolerated by a majority: slightly over 60% of respondents. While recycling is well-proven and widely encouraged by governments in every corner of the world, eco-design remains relatively unknown; and in certain countries, such as Japan, Morocco and China, there is continued refusal to accept packaging made from recycled plastic for cultural reasons.

For these three types of solutions, 18- to 24-year-olds are the most reticent about accepting the changes that ecological solutions will demand. They are noticeably cautious when it comes to each of the solutions tested (new food habits, cultural changes in favor of bioconversion and wastewater reuse, proximity to industrial sites, etc.): for example, in energy, 60% of them accept most of the solutions, which is a respectable average but still 3-4 points below their elders.

**“We need to reconsider our vision of the world with an ecology that is not just restrictive but also — and above all — attractive.”**

**Estelle Brachlianoff**  
Chief Executive Officer, Veolia

**VEOLIA, BUILD US A SUSTAINABLE AND DESIRABLE FUTURE!**

“Where are we heading? What does the world look like after the ecological transformation?” Lots of questions – with too few answers. But ecological transformation must allow people to project into the future. This vision of the future must be built together by every section of society. It is up to businesses to suggest solutions that will make this future better, more exciting and desirable. Veolia believes in the ecology of solutions, one of the key levers to meeting the climate and environmental challenges the world faces. 50% of the solutions exist, 50% are still to be invented; it seems that we now need to teach people about them and demonstrate the benefits. If now is the time for action, there also needs to be a genuine, ongoing dialogue between citizens, businesses and public authorities so that, working together, we can build a project for the future. ▶



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## And tomorrow?



# Barometer of ecological transformation

This online opinion poll ran in 25 countries on all five continents, polling over 25,000 people aged 18 and over (around 1,000 respondents per country). Together they form a panel that will be consulted for the barometer every 18 months, allowing a picture to be drawn of changes in representations, opinions and behaviors. Countries were selected based on their demographic weight (together representing 60% of the global population), share of greenhouse gas emissions (68% of total emissions) and their cultural, political and ecological diversity: frontline countries facing the effects of the climate crisis and various other precursors of ecological policies. When analyzing global opinion, and to make sure that diversity is represented, each country counts for one voice.

**Europe:** France / United Kingdom / Spain / Poland / Czech Republic / The Netherlands / Belgium / Finland / Germany / Italy

**Asia:** China / Indonesia / India / Japan / United Arab Emirates / Saudi Arabia

**Americas:** USA / Brazil / Chile / Colombia / Mexico

**Africa:** Morocco / Ivory Coast / Nigeria

**Oceania:** Australia



## Acceptability in 3 countries:

what efforts are acceptable to the French, Belgians, Chinese and Americans?

### **France: the circular economy and diets**

**84%** would accept to sort their waste more

**77%** are prepared to accept the installation of waste treatment industrial recycling plants near their homes

**70%** could reduce their consumption of meat

### **China: energy sobriety and air quality**

**91%** would be willing to pay a little more for “locally-sourced” energy emitting less CO<sub>2</sub>

**90%** support a higher price per cubic meter of water to develop reuse of treated wastewater

**89%** are willing to pay more taxes for the installation of indoor air quality sensors in public buildings

### **United States: recycling and local loops**

**77%** can imagine buying their processed food in recycled packaging

**67%** would buy a car (or any other means of transport) partially manufactured from recycled materials

**60%** would welcome the installation of wastewater treatment plants near their homes

# GreenPath Zero Carbon

## 100 solutions for a sustainable model

GreenPath Zero Carbon is a new initiative that represents the best of Veolia's expertise from across its three business activities. It provides a cornerstone to support customers in their efforts to decarbonize, delivering cuts in greenhouse gas emissions of up to 80%.

Carbon neutrality is non-negotiable for every economic actor and stakeholder engaged in fighting the climate crisis. The European Union has set itself the target of becoming carbon neutral by 2050.

Veolia has designed its new GreenPath Zero Carbon approach to help its municipal, industrial and service industry customers accelerate decarbonization. Its key benefit is the reduction of as much as 80% in direct and indirect emissions across customers' entire upstream and downstream value chains. How? By rolling out and combining 100 solutions that capitalize on Veolia's expertise. Three quarters of these solutions are fully tried and tested, such as the introduction of boilers that use solid recovered fuels to replace previous gas- or coal-fired installations facilities. The other 25% of the solutions are the fruit of Veolia's innovation efforts in fields such as carbon capture, utilization and storage (CCUS), high-temperature heat pumps, and green hydrogen.

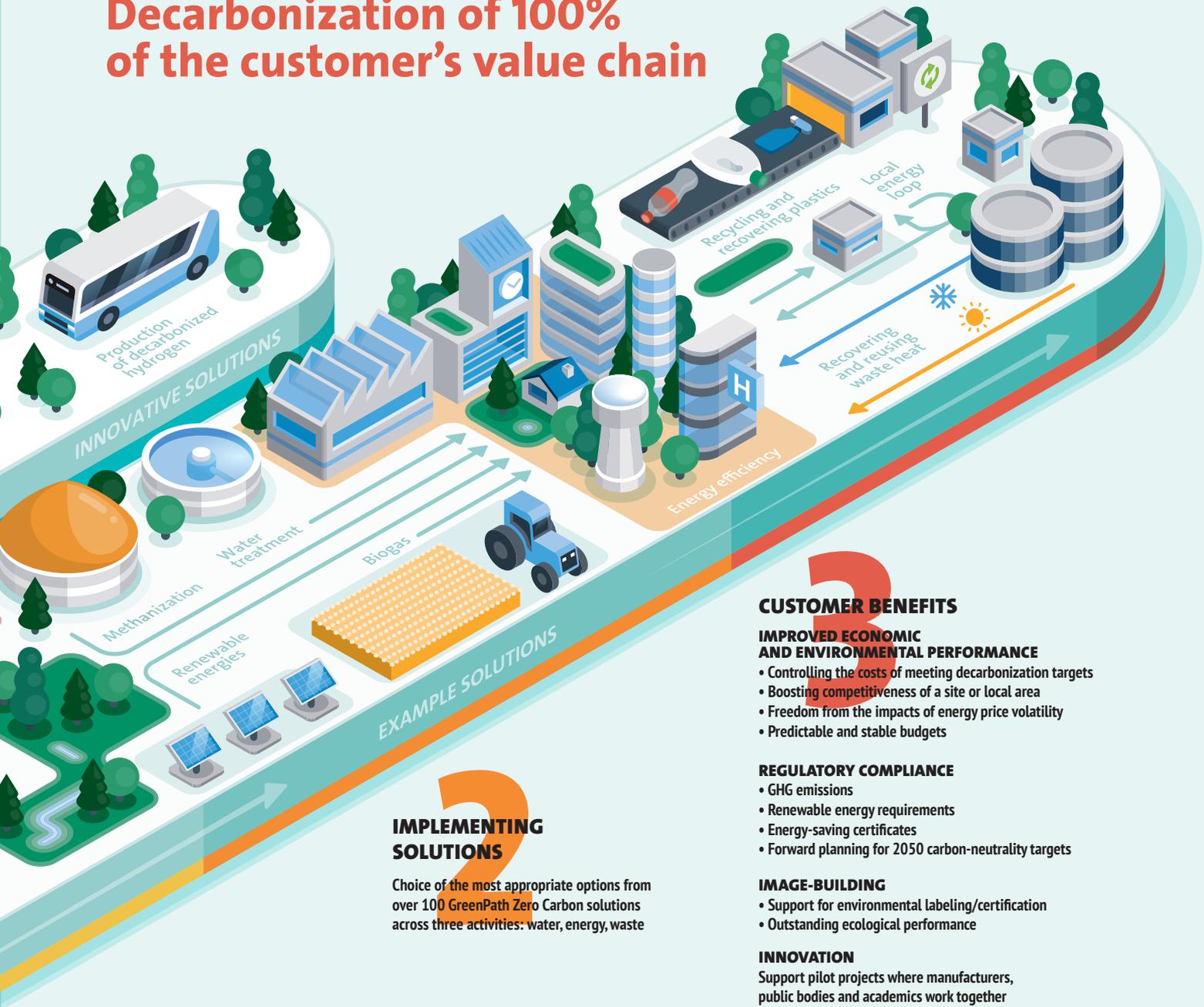
### CUSTOM RESPONSES TO ADAPT BUSINESS MODELS TO CLIMATE CHALLENGES

There are two primary components that set GreenPath Zero Carbon apart from other industrial ecology solutions. First is the ability to capitalize on synergies between Veolia's expertise, at the intersection between energy, water and waste management. For example, energy recovered from waste is used to supply low-carbon energy to a district heating network, giving people living in multi-occupancy units better control over heating costs. In another example, a council building or swimming pool can be heated using calories recovered from wastewater. Just two illustrations of the vast range of synergies that Veolia is ideally positioned to exploit. The other standout feature is the ability to highlight the climate impact of the solutions offered to customers. A diagnosis established with a digital tool is used to set out a decarbonization pathway based on a specific roadmap and incorporating intermediate and final decarbonization targets. It can also include a commitment to reducing emission volumes by specified amounts.

In the future, the same approach will be able to be applied to assess impacts on biodiversity or water footprint. ▀



# Decarbonization of 100% of the customer's value chain



## IMPLEMENTING SOLUTIONS

Choice of the most appropriate options from over 100 GreenPath Zero Carbon solutions across three activities: water, energy, waste

## CUSTOMER BENEFITS

### IMPROVED ECONOMIC AND ENVIRONMENTAL PERFORMANCE

- Controlling the costs of meeting decarbonization targets
- Boosting competitiveness of a site or local area
- Freedom from the impacts of energy price volatility
- Predictable and stable budgets

### REGULATORY COMPLIANCE

- GHG emissions
- Renewable energy requirements
- Energy-saving certificates
- Forward planning for 2050 carbon-neutrality targets

### IMAGE-BUILDING

- Support for environmental labeling/certification
- Outstanding ecological performance

### INNOVATION

Support pilot projects where manufacturers, public bodies and academics work together

## In Austria, the benefits of the One Veolia approach to achieve Net Zero by 2030

At a pharmaceutical manufacturer's site, Veolia started by focusing on energy efficiency (15%), followed by heat recovery (22%) and

renewable energy (45%), including installation of a biomass boiler (using sustainably sourced fuel), methanization and voluntary offsets

(18%). A showcase decarbonization pathway, delivering carbon neutrality where annual CO<sub>2</sub> emissions previously exceeded 66 kt.



# OLA, DRIVING SOCIAL CHANGE

Providing access to employment to help people return to financial independence and regain control over their lives: this is the goal of Occupation, Leadership, Accompaniment (OLA), a program run by Agbar, a Veolia subsidiary in Spain, as part of a public-private partnership with the Red Cross and a number of local municipalities. Set up in Catalonia in 2020, OLA has already demonstrated the effectiveness of this alliance of actors as it seeks to drive social change across the country.

Spain has seen a sharp rise in social inequality caused by the cumulative effects of the Covid pandemic, economic uncertainty and inflation. Currently, over one in four Spaniards is at risk of poverty or social exclusion.<sup>1</sup> Agbar has operated programs to guarantee the right to water for a number of years, including a solidarity fund, social tariff and a scheme to spread out payments. “But for most beneficiaries, this is not enough to allow them to become financially independent,” remarks Felipe Campos Rubio, head of Social Outreach at Agbar.

“Getting a decent job is the only way they can climb out of poverty.” The Veolia subsidiary supports a program of individual training and self-empowerment courses run by the Red Cross in collaboration with the city councils and local public services to help those in the most severe need. The OLA (Occupation, Leadership, Accompaniment) program boosts people’s employability by providing tailored help with returning to the labor market. The results speak for themselves: 94% of the almost 200 participants since 2020 completed the program, while 56% found a job during the program.

## **Personalized support**

What lies behind this success? A combination of expertise that delivers maximum impact. The Red Cross offers personalized support to each beneficiary, centering on developing their skills and sense of self-worth and boosting their self-confidence and self-esteem. The NGO also provides assessments, training and lessons in digital skills to increase people’s chances of landing a job. Agbar covers their basic needs. Another innovative approach championed by the OLA program is that it systematically measures the social impact of each of its actions. One success story is Grecia G., who has found a new job: “OLA gave me the help I needed to find a fixed-discontinuous contract<sup>2</sup>, which has given me so much more security. I was able to make my skills and experience count: OLA is a big help if you’re looking for work.” Now that it has proved its worth, OLA is being rolled out across the country. ■

1. 27.8% in 2021 according to the latest report from the European Anti-Poverty Network (EAPN).  
2. A new type of permanent contract available after the labor law reform in Spain.

# Veolia, benchmark for ESG value

Veolia is committed to a project that is ambitious, urgent and vital: ecological transformation. The scale of the challenge reflects the scale of a Group which, with the successful integration of activities previously provided by Suez, now forms a 220,000-strong team at the cutting edge of water, waste and energy management.

A Group that provides its customers with all the benefits of its innovations and the expertise that it has acquired over more than a century, supporting them as they embark on the ecological transformation of their own activities.

In 2022, Veolia's services allowed its customers to avoid the emission of 14 million metric tons of CO<sub>2</sub>, equivalent to 14 million Paris-New York return flights. It also saved over 300 million cubic meters of water, equivalent to the total used every year in Singapore or the Hauts-de-France region. Veolia also rolled out a range of social and governance initiatives, including base-level social benefits for all employees and a procurement policy that makes 85% of purchases locally, as well as the appointment to the board of directors of a representative of its employees, who became its largest shareholder in January 2023.

This is why it is fair to think of Veolia as the benchmark for environmental, social, governance (ESG) value creation because, unlike other businesses, this is integral to everything it does. Non-financial ratings, published to provide insights about Veolia's impacts, are a perfect illustration. Veolia has drafted multi-faceted performance guidelines that look beyond standalone ESG performance. This means that it treats ESG and financial considerations as indivisible when developing

its strategy and in the systems used to manage its activities. By acting every day with a determination to be useful, the Group helps decontaminate, decarbonize, distribute and regenerate resources.

However, ESG ratings for the new global champion of ecological transformation fail to recognize the emissions that it helps its customers avoid. Currently, ESG ratings examine data on the three scopes used to identify



the source of a product's or organization's greenhouse gas emissions within its overall carbon footprint: Scope 1 for direct emissions, Scope 2 for indirect energy-related emissions, and Scope 3 for indirect external emissions.

To gain greater recognition for its climate actions, Veolia is advocating for changes to the assessment criteria used for ESG ratings and for the inclusion of a fourth scope for emissions avoided, compared to existing solutions, a blind spot in today's environmental ratings systems. Scope 4 would recognize the efforts of actors working to decarbonize the economy. ▶



## #Key figures

### A list

Veolia joined the CDP A List, scoring a maximum double A

for its Climate Change and Water Security responses, up 2 and 1 grades respectively on a scale running from D- to A

Veolia is the only business in its sector

non-energy utilities, to be rated A in the CDP Climate Change and CDP Water Security lists

### 82/100

With a score of 82/100, Veolia is one of just four companies selected for the Dow Jones Sustainability World Index (DJSI), and is one of two selected for the DJSI Europe in the multi and water utilities sector

### 1<sup>st</sup> place

Veolia was awarded first place in the waste and water utilities sector by Moody's ESG Solutions, and was rated among the top 3% companies by Ecovadis (2022 ESG ratings)



Less  
waste  
water

More  
recycled  
water

Regions can conserve water resources, save energy and be more secure in the face of drought by recycling wastewater. Together, let's take up the challenges of ecological transformation and energy independence.

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