



PLANET

WWW.VEOLIA.COM



FUTURE GENERATIONS

Focus
Artificial Intelligence



PLANET

PUBLISHED BY VEOLIA – 30, RUE MADELEINE VIONNET – 93300 AUBERVILLIERS – FRANCE
 Publisher and Editorial Director: **Laurent Obadia**.
 • Copyright: **March 2024**. ISSN Number: **1761-4996**. • Photo credits: **Maud Evrard / Wipplay; Christophe Le Boulaire / Wipplay; MengWen Guo / E+ / Getty Images; Claire Millerand / Wipplay; Isabelle Serro / Wipplay; Adeline Spengler / Wipplay; Rodrigo Van Peteghem / Wipplay; Narumon Bowonkitwanchai / Moment / Getty Images; Yuichiro Chino / Moment / Getty Images; Dimitris66 / DigitalVision Vectors / Getty Images; Aaron Foster / Photodisc / Getty Images; Robbie Goodall / Moment / Getty Images; Maskot / Getty Images; zf L / Moment / Getty Images**. • Veolia media library: **Boby / Fisheye; Aglaé Bory; Martin Colombet / Fisheye; Alexandre Dupeyron; Olivier Guerrin; Cheryl J. Hoffmann / ENTOFOOD; Stéphane Lavoué; Christophe Majani d'Inguibert; Julien Muguet; Christel Sasso / CAPA PICTURES**. • Illustrations - Events: **Federica del Proposto / Agent 002. Decoding: Creamcrackers**. • Cover photo credits: **This visual was created with the help of artificial intelligence. Aaron Foster / Photodisc / Getty Images**.
 • Produced by: **BORDS DE LOIR**. • Printed by: **STIPA**. To help protect the environment, this document has been produced by an Imprim'Vert® printer. The paper used is made from materials sourced from sustainably managed forests, is fully recyclable and PEFC- and/or FSC-certified.

PLANET

RESOURCING THE WORLD

03. THE POST
By Estelle Brachlianoff

05. EVENTS

06. ELSEWHERE
Envisioning a desirable and sustainable future

18. INSIDE
The news in brief

21. TRENDS
Quantum ecology to the planet's rescue

22. CAMPAIGN
Verso: a behind-the-scenes look at ecological transformation!

24. DECODING
AI: helpful or harmful for the environment ?

26. APPOINTMENT
The world as told by AI: opportunities and constraints of the artificial narrative, with Estelle Brachlianoff and Veolia Secure GPT

32. #WeAreResourcers
Meet Veolia employees Ariska, Florian and Dorottya

38. FOCUS
ARTIFICIAL INTELLIGENCE
Hubgrade by Veolia, an accelerator of ecological transformation
AI: accelerating transitions for cities and industry alike Veolia Secure GPT: boosting efficiency with AI

58. AND TOMORROW ?
Greening tomorrow's world through technological innovation

68. POSITIVE IMPACT
Veolia Cares: focusing on employee well-being

70. VEOLIA MASTERCLASS
Terra Academia, the first school dedicated to accelerating ecological transformation

71. HORIZONS
GreenUp: Strategic program for 2024-2027



ESTELLE BRACHLIANOﬀ
Chief Executive Officer of Veolia

“We are at a crossroads. In a world of paradoxes, between climate denial and calls for an ecological pause, Veolia offers a third way: an ecology that transforms, decarbonizes, depollutes, regenerates, and protects.”

We have just announced our new strategic program, GreenUp, which accelerates the deployment of practical, affordable, and replicable solutions that depollute, decarbonize, and regenerate our resources.

GreenUp means greening for real and for a long time to come. In our collective quest for a greener world, GreenUp is much more than an initiative at Veolia: it is a call to accelerate and become the missing link in ecological transformation. What we need is to truly green all our essential activities, without which we could not live together or live well, and without which we could not consider a desirable future, the glue that binds any society together.

GreenUp means accelerating with an ecology that transforms and protects. At a time when the cost of ecological inaction far exceeds the cost of action, GreenUp is offering a crucial response. Its aim is not only to transform but also protect. At Veolia, our solutions meet our customers’ strategic needs, positioning the Group at the heart of a colossal market.

GreenUp means accelerating with the power and agility of a champion. Despite our size, we are agile, as demonstrated by our successes through the challenges of Covid, the energy crisis, and the recent merger with SUEZ. This scale is the key to being an indispensable point of contact for our customers. And what makes us all the more relevant is the combination of our business activities, at the crossroads of water, energy, and waste. Finally, we also owe our power and agility to our employee engagement, which now stands at a record-breaking 89%.

GreenUp means accelerating by taking action wherever the greatest challenge lies. We are not simply content to green the easy areas but also those areas where the challenges are most complex. This means focusing our efforts on areas where greenhouse gas emissions are highest, where pollution is most serious, where natural resources are rarest. It is both a responsibility and an opportunity for us, and by tackling the most critical challenges, we will be able to make a real impact. To achieve this, **three growth boosters are guiding our acceleration:** bioenergy, flexibility and energy efficiency; water technology and new solutions; and hazardous waste treatment. These represent high-impact areas, that we intend to strengthen through €2bn of investment.

GreenUp means accelerating our ability to innovate, a crucial catalyst for Veolia. We will double our investment in research, industrial pilots, and new technology to €200 million by 2027. Through our global research and innovation network, we focus on key areas such as treating new pollutants, capturing carbon, recycling strategic metals, and integrating generative AI into our processes.

Finally, GreenUp means accelerating side by side with our partners, because we’re building tomorrow’s world alongside all our stakeholders. Public opinion has become our leading influencer, and we must take full account of it in our actions. The market in which Veolia operates is no longer simply one of supply but one of demand. GreenUp meets this growing demand by accelerating our efforts for decarbonization, adaptation, acceptability, and competitiveness.

As you can see, GreenUp is not simply an ecological transformation but a reconciliation of the economy and ecology. GreenUp means making Veolia a champion of decarbonization, with 18 million metric tons of CO₂ (scope 4) eliminated on behalf of our customers, a champion of depollution with 10 million metric tons of hazardous waste treated by 2027, and a champion of efforts to regenerate natural resources, starting with water, with 1.5 billion cubic meters saved. It is a virtuous circle that combines financial success with a positive environmental impact.

It’s time to GreenUp!

Contributors



218,000 of us. Veolia employees.

We are a team dedicated to ecological transition. We are the Resourcers. Planet is our magazine, but it is also yours. To everyone who works each and every day for a sustainable and desirable future, read on to discover our stories and projects – and yours, too. Let's share our commitment and our solutions for the planet. Together we can turn the tide.

Let's join forces for ecological transformation and make the impossible possible.



Editors-in-chief (left to right):

Laure Antoni, Manon Capmarty, Selen Daver, Fanny Demulier, Feryel Gadhoum, Carrie Griffiths, José Guerra, Céline Hallier, Denisse Ike, Eva Kucerova, Gabriella Lazzoni, Nicolas Levy, Robert Lozano Vergés, Evgeniya Mazalova, Kate Moonen, Romain Prudent, Cory Reynolds, Justine Shui, Arthur Thoux.



Stuart STOCK

Stuart Stock is Head of Digital Business & Technology at Veolia Group and has over 20 years of expertise in technology and data. Stuart began his career at Veolia UK & Ireland. His unending thirst for knowledge led him to move from finance to strategic IT responsibilities for the Northern Europe zone. Since joining the Group, Stuart has played an essential role in implementing a centralized data strategy and promoting AI-based innovation to support a digital transformation built on creating value for Veolia.



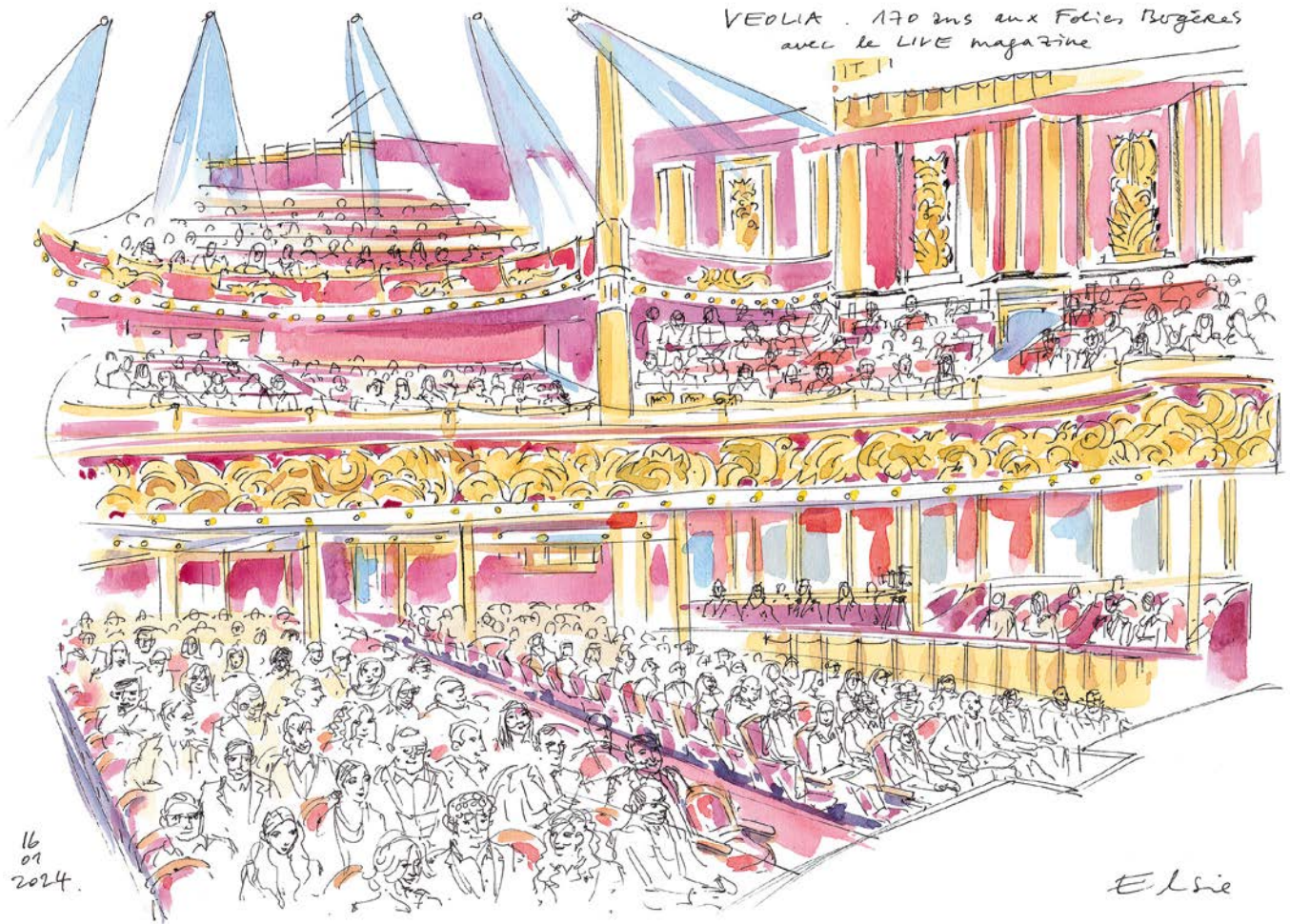
Sébastien DAZIANO

A graduate of Sciences Po and an alumnus of the École Nationale d'Administration, Sébastien Daziano began his career in the civil service as a sub-prefect in Nancy before joining the French Ministry of Foreign Affairs as Bureau Chief for Turkey and Cyprus. His expertise led him to hold key posts, including Chief of Staff to the Secretary of State for Foreign Trade at the Ministry of Finance and Security Advisor to the Minister of the Interior. In 2019, he became Director of Executive Coordination, Public Affairs and Security at Suez. In 2022, Sébastien Daziano joined Veolia's Executive Committee as Senior Executive Vice President, Strategy and Innovation.



Veolia Secure GPT

Developed by Veolia in 2023, this generative artificial intelligence is a secure, effective assistant for the Group's 218,000 employees. Veolia Secure GPT is the result of a pioneering approach and a major innovation. Users can safely interact, access information, and translate and analyze data.



DECEMBER 14, 2023

VEOLIA CELEBRATES 170 YEARS OF INNOVATION

Born at the heart of the first industrial revolution on December 14, 1853, under the name Compagnie Générale des Eaux, Veolia has embarked on an

exciting adventure in service of the environment. 170 years later, the Group continues to innovate and shape the world of tomorrow, a world that works for

ecological transformation. Let's continue along this path and keep making the impossible possible.

<https://www.veolia.com/en>

ENVISIONING A DESIRABLE AND SUSTAINABLE FUTURE

Renewing hope. This was the powerful message chosen as the central theme for the 23rd Rencontres Économiques d'Aix-en-Provence, held in France in July 2023. In addition to being a key subject of discussion, the theme was explored in an exhibition based on a vast photographic survey called *La cartographie collective - Recréer l'espoir* [Collective Mapping - Renewing Hope] carried out in France in collaboration with Veolia. A jury of photographers, economists, journalists, campaigners and civil society representatives selected 12 winning photographers whose work you can discover below.

The entirety of the *Recréer l'espoir. Hop, hop, hope!* photographic collection is available on the online community platform Wipplay.





© RODRIGO VAN PEGHEM

Rodrigo13

Amor, respeto, talento [Love, Respect, Talent] - 1st jury prize

Previously associated with the drug trade in the Colombian city of Medellín, La Comuna 13 is undergoing a revival centering on tourism and street art. Malu Médina is a neighborhood community leader who works tirelessly for peace, using art as a tool to build bridges between different communities. She works extensively with street children who experience art not just as a chance to escape their day-to-day lives but also a reason to believe in a happier tomorrow. Rodrigo, a photographer and cultural mediator born in Colombia who is French at heart, never stops seeking the spark for works that stand the test of time.



© ADELINE SPENGLER

Adeline Spengler

L'arbre à contes [The Story Tree] - 2nd jury prize

Lift up your eyes to change your perspective, leave your worries behind, meditate, forget about the constant pressure and obsession with speed; instead, embrace the happiness of living in the moment. This ode to the joys of slowing down also invites us to let our most powerful memories flood over us. Photographer Adeline Spengler creates a dreamlike atmosphere, rekindling hope by restoring nature to its rightful place in her images. As she transports us into this poetic dreamscape, the Paris-based artist subtly captures the transience of a moment, somewhere between dream and reality.



© CHRISTOPHE LE BOULAIRE

Christophe Le Boulaire

La classe ! [Classy!] - 3rd jury prize

Sometimes all it takes is one determined person, one gesture of revolt, to stir a crowd. Or simply to awaken those who are asleep or disheartened. And when the act takes place in a classroom, it symbolizes the hopes of an entire generation. It lets in a glimmer of hope – the hope of a happy ending. For globe-trotting humanist photographer Christophe Le Boulaire, every journey he takes is about collecting moments of truth and welcoming the gift that the faces of certain people have to offer.



© ISABELLE SERRO

Isabelle Serro

Mal de mer, maux de terre [Sea Sick, Land Sick]

In the Gulf of Guinea, 70% of the protein consumed by local residents comes from fishery products. Today, this resource vital to millions of people is threatened by offshore industrial fishing and environmental pollution. United against these *Mal de mer, maux de terre [Sea Sick, Land Sick]*, communities of women are creating new hope by turning to solutions such as aquaponic fish farming as they attempt to reduce nutritional deficiencies and shape a better future for the local population.

De l'ombre à la lumière
[From Shadow to Light]

In northern Madagascar, Mr. and Mrs. Sept-Sept are stepping into the light in their small restaurant. The arrival of electricity, which has led them *De l'ombre à la lumière* *[From Shadow to Light]*, gives them and their two children a true reason to celebrate in a region badly affected by malaria and typhoid. It shines an optimistic light on the family's day-to-day life, heralding the promise of a brighter future.



© ISABELLE SERRO

Adeline Spengler

The jump - Touch the sky

A powerful *Jump*, reaching into the air as if to *Touch the sky*. The bright white cloud above the jumping girl seems to offer her a heavenly shelter. The vigor of her jump transcends the frontiers of reality. Her energy fills the space between land and sky. Boldness, determination, and a willingness to go beyond limitations and be guided by aspirations are all seeds of hope just waiting to sprout and grow.



© ADELINE SPENGLER



© MAUD EVRARD

Maud Evrard

Le cap [Headland]

In a heathland landscape beneath a stormy sky at Cap Fréhel in Brittany, France, a mother and her children stand tall and upright, hand in hand, confident and self-possessed. Their gaze is fixed on some other place, somewhere inviting that appears to fascinate them. In the face of adversity, humanity remains a source of hope. This image symbolizes a refusal to accept inevitability and the determination to strive together to create new future possibilities.



© MAUD EVRARD

Kosmogonía

Taken from a series called *kosmogonia* ("creation of the world" in ancient Greek), this image evokes the interweaving of humans, animals and plants. The human figure is immersed in nature, at one with the environment, magically hinting at the ties that unite the different organisms of the living world. This is a peace-filled place that reveals a world where everything exists in correlation.

Auclairde

Grand vent [Big Wind]

Harmony and serenity reign in the place where people and nature are on the same wavelength. As the *Grand vent [Big Wind]* blows, each becomes a mirror of the other, in a form of unbounded respect and acceptance of an unmistakable interdependency. A state of grace that is palpable, kindling an endless source of hope.



© CLAIRE MILLEFAND



Cedche

Solidarité ! [*Solidarity!*]

It is difficult to imagine and plunge into tomorrow's world. But there is a fundamental concept that can help: *Solidarity!* What could be better than to stand together, hand in hand, to face down adversity with courage and clarity? Just like diving into the 14°C waters of the English Channel and swimming off in the same direction. Saving our planet could not be more gratifying.

Taïeb

Le gardien du vent
[The Guardian of the Wind]

Burning Man festival, September 2011. Sitting among the art installations dotted across the Nevada desert, *Le gardien du vent* [The Guardian of the Wind] conveys a highly original vision, rooted in a unique utopian paradigm: the counterintuitive alliance between a form of obsolete technology and a hostile environment. The human being becomes the sole and final remedy in a daring attempt to control the elements.



© M. TAÏEB

Morfeuh

*Poor lonesome phoneboy
(ultra moderne solitude)*

Polignac, Haute-Loire, France. The mid-summer Saint-Jean bonfire is roaring. A young man sits apart, his face lit up by his cellphone.

This *Poor Lonesome Phoneboy*, the epitome of *ultra-modern solitude*, is in control of his environment and his communications. He is a 21st-century cowboy, armed with knowledge and the power of awareness in the battle to protect the planet, planning for a radiant future.



© P. ROMEUF



MALAYSIA

Insect-based bioconversion approved by the EU

As demand for alternative protein sources in the animal feed industry increases, Veolia Bioconversion Malaysia Sdn Bhd acquired approval from TRACES — Europe’s health and phytosanitary certification platform — to operate in the European market. The Group, which runs one of Asia’s largest industrial structures dedicated to insect production with a capacity of 3,000 metric tons per year, aims to provide its clients with high-quality products and a stable food source through the sale of its protein products: Entomeal™ (flour) et Entolipid (oil). The bioconversion process guarantees greater food security and rises to the challenge of feeding 10 billion people by 2050, all while using less water, energy, and land.

AS PART OF ITS SPONSORSHIP OF THE TELECOM PARIS CLASS OF 2025, Veolia is raising future digital engineers’ awareness of the challenges of ecological transformation while inviting them to join the Group for an internship or after graduating.

WORLD

Veolia Cares, a unique worldwide social protection program

In September 2023, Veolia began rolling out Veolia Cares, an inclusive global social protection initiative for its 218,000 employees, extended to regions where legal mandates for such provisions are lacking. The program gives each employee access to parental leave, health and death coverage, life insurance, support for staff who work as caregivers, and an annual day off to support a charitable or environmental cause. Implemented on an unprecedented scale, it is available to all Veolia employees, whether they work in the field or in-office, and whether they have fixed-term or permanent contracts.

SOUTH KOREA

Providing a key technology for the country's first lithium hydroxide plant

Lithium is a strategic commodity that plays an essential role in developing sustainable mobility. POSCO Lithium Solution, a subsidiary of South Korea's largest steel manufacturer, has chosen Veolia to provide its technological and industrial expertise for the production of battery-quality lithium hydroxide. The aim is to design and deliver an integrated conversion system using its advanced HPD® purification and crystallization technology, which refines salts needed for electric battery production. With an annual production capacity of 25,000 metric tons, the facility will provide enough high-quality lithium for around 600,000 electric vehicle batteries. This will be a real asset for South Korea, the world's second-largest producer in this sector, as it works to step up domestic production of lithium hydroxide.

THE BLUE CIRCLE PROJECT TO TACKLE PLASTIC POLLUTION, launched and implemented by Zhejiang Lanjing Technology and co-sponsored by Veolia China, has been named a 2023 Champion of the Earth, one of the UN's highest environmental distinctions.

IVORY COAST

Ensuring sustainable access to water in West Africa

The Ivorian government has extended its contract with its long-term partners, Veolia and PFO Africa, tasking them with operating and maintaining the La Mé drinking water plant. In operation since June 2023, La Mé has one of the largest drinking water plants in West Africa. It was designed to meet the capital's growing demand for water and tackle the challenge of sustainable access to water by treating surface water from the Mé River. The plant's primary strength is its exemplary water treatment process, ensuring year-round production that meets quality and quantity standards in all seasons, irrespective of water turbidity or color. With a production of 240,000 cubic meters of drinking water each day, the site will meet the daily needs of Abidjan's 2.4 million residents.

FRANCE

Reusing water to produce potable water

As part of the Jourdain program, Vendée Eau recently inaugurated the first treated wastewater reuse facility in France for the production of potable drinking water alongside Veolia, who designed and operates the equipment used. The goal: create a complementary resource for the production of potable water in Vendée in order to prepare the region for possible water shortages in the summer. A concentrate of innovation, the refining unit designed by Veolia uses patented Barrel™ technology, employing low-pressure reverse osmosis. Ultraviolet disinfection and chlorination guarantee the production of fresh water that meets quality standards. The demonstration phase (2024-2027) will reuse up to 0.5 million m³ – equivalent to the consumption of 15,000 inhabitants – with the objective of quadrupling this volume.



WORLD

Hubgrade by Veolia reinvents resource management

Veolia's pioneering role as the first to use AI to support ecological transformation in its three core business activities led to the large-scale launch of its range of digital solutions, Hubgrade by Veolia, in 2023. Its aim is to steer production and consumption of water, energy, and waste so that cities and industries can move toward smarter, more secure, and more sustainable management of their resources. With over 10,000 sites worldwide already connected to the system, the Group operates a vast network of 60 monitoring centers manned by 500 experts and data scientists.

IN WINDHOEK, NAMIBIA, THE CONTRACT FOR PRODUCING DRINKING WATER DIRECTLY FROM HOUSEHOLD WASTEWATER HAS BEEN EXTENDED BY THREE YEARS. Veolia has been operating an innovative and sustainable model for reusing treated wastewater in Windhoek since 2002, with a plant using advanced technology to supply almost 400,000 residents in the capital.

OMAN

The Middle East's largest solar desalination project

Veolia and TotalEnergies have recently opened the largest solar power plant located within a desalination plant, Sharqiyah Desalination, in the city of Sur. Setting a benchmark for desalination in the Persian Gulf, the plant provides drinking water to more than 600,000 residents in the east of the country. The solar project, with a capacity of 17 MWp, stands as the first initiative of its kind in the Middle East. At maximum power, the plant will generate more than 30 GWh of green energy annually, meeting over a third of the plant's daily power requirements and reducing its annual CO₂ emissions by around 27,200 metric tons.



In partnership with solar car park specialist 3ti, **VEOLIA STARTED GENERATING RENEWABLE ENERGY AT EASTBOURNE DISTRICT GENERAL HOSPITAL IN THE UNITED KINGDOM. THE FIRST HOSPITAL IN THE COUNTRY TO TAKE THIS MAJOR STEP**, it will generate 1,000 MWh of solar electricity every year, reducing its CO₂ emissions by 222 metric tons from the first year.

UNITED STATES

Expanded presence in hazardous waste processing

Veolia recently acquired U.S. Industrial Technologies, a Michigan-based company, bolstering its presence in the hazardous waste market in the United States. The acquisition reinforces the Group's dedication to environmental stewardship, emphasizing efforts to reduce water and soil pollution while safeguarding resources. In addition, Veolia is broadening its reach by offering customized services to key clients, including governments, municipalities, and businesses in diverse sectors such as automotive, technology, health, pharmaceutical, petrochemical, and agriculture. With this acquisition, Veolia's Environmental Solutions and Services business now employs over 2,300 people at 200 sites in the US.

VEOLIA IS INSTALLING A SOLAR ENERGY SYSTEM AT ITS WASTE TREATMENT SITE IN GUM SPRINGS, ARKANSAS (USA), which will be operational by the end of 2024. The electricity generated will meet the facility's daily requirements and offset around 105,000 metric tons of carbon emissions from the plant over the next 25 years.

UNITED ARAB EMIRATES (UAE)

Energy-efficient desalination in Abu Dhabi

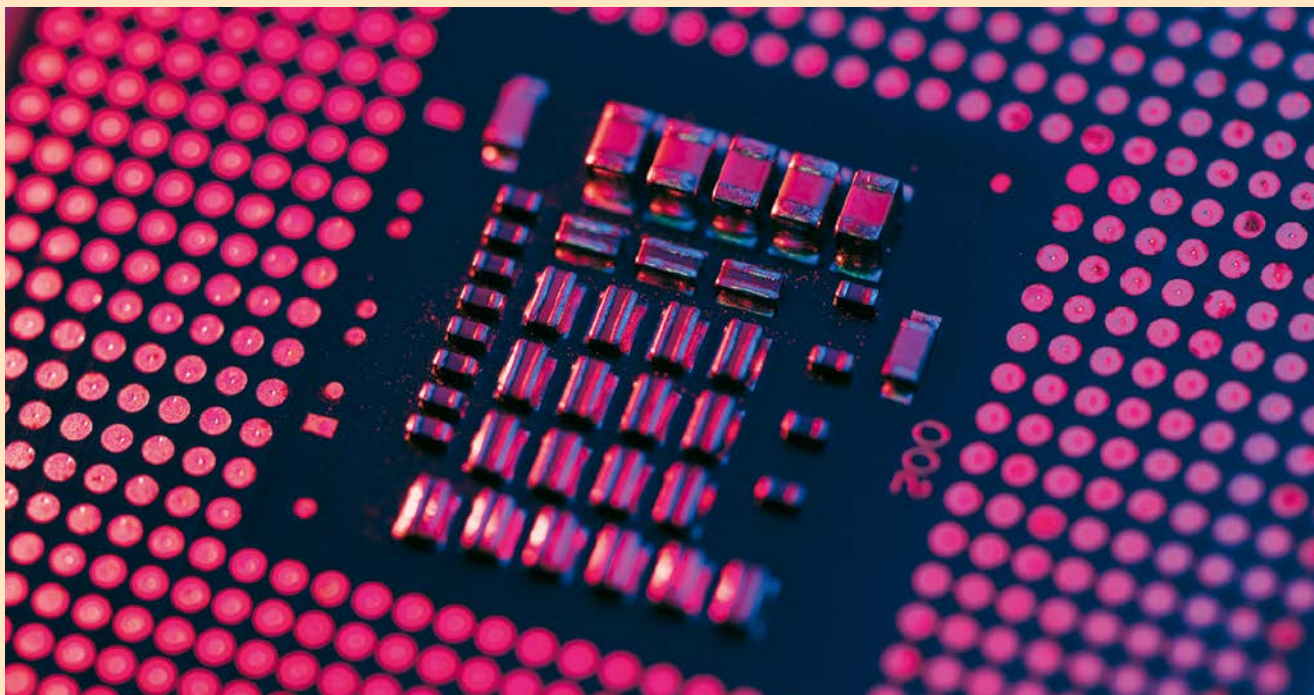
By heading the consortium responsible for building the Mirfa 2 plant commissioned by Abu Dhabi National Energy Company PJSC (TAQA) and Engie, Veolia is reinforcing its position as the leader in advanced water technologies with the rollout of its reverse osmosis process. The third-largest desalination plant in the UAE, Mirfa 2 will soon use 80% less energy than the plants of the 1980s. With a daily drinking water production capacity of 550,000 cubic meters, it will supply around 210,000 households, with increased efficiency and a smaller environmental footprint. The €300m project will start operations in 2025, in the wake of the successful opening of four flagship plants providing drinking water to over six million people in Saudi Arabia, Umm Al Quwain in the UAE, Bahrain, and Iraq.

TRENDS

Quantum ecology to the planet's rescue

In the quest for innovative solutions to address the global challenge of climate change, quantum ecology is emerging as a promising research field, offering revolutionary perspectives. In the United States, researchers from the National Energy Technology Laboratory and the University of Kentucky are exploring the use of powerful quantum computers to capture atmospheric CO₂. The objective: to find new molecules, such as ammonia-derived amines, capable of chemically binding CO₂. This solution, currently the only one capable of capturing millions of tons of CO₂ per year, opens up unprecedented possibilities. In Canada, the Q4Climate group, coordinated by Karl Thibault from the Quantum Institute at the University of Sherbrooke,

mobilizes interdisciplinary research at the intersection of quantum and climate to develop more energy-efficient technologies. Future mobility is also on the agenda: Airbus and BMW's Quantum Mobility Quest project, launched in December 2023, harnesses the speed of quantum computers for practical applications, such as predicting molecular reactions, essential for developing cleaner technologies by anticipating phenomena like corrosion or material reactions to hydrogen. By combining the power of quantum computers with a deep understanding of these phenomena, this approach promises to revolutionize our approach to addressing and solving current environmental challenges.



Sustainable fashion in vogue

Is sustainability fashionable? Stella McCartney's prominent presence at COP28 underscores the persistent challenges of responsible fashion, despite individual efforts. A pioneer for two decades, the British designer prioritizes vegan materials with a low carbon footprint, excluding

leather, fur, and animal skins from her collections. The world's third-largest manufacturing sector, responsible for 10% of global CO₂ emissions, struggles to meet reduction targets and must strongly commit to the climate trajectory set by the Global Fashion Agenda. The

growth of the resale market and alternative models indicates progress, but circular economy input remains limited. Substantial advancements are needed to make fashion sustainable and communicate these benefits to consumers.

Verso: a behind-the-scenes look at ecological transformation!

Bring on the analysis, decryption and learning opportunities about ecological transformation's challenges and solutions! This is the idea behind Verso, Veolia's new YouTube channel targeting the general public and above all younger generations, who are very preoccupied with environmental issues. Verso explores the science behind these issues in simple, easy-to-understand language, answering a host of questions on any and all topics related to the environment, ranging from the most basic to the most unexpected.

Traveling in one of Veolia's all-electric trucks, French influencers and science communicators Virginie, Antoine and Chloé set off to meet experts from Veolia and their customers and partners: the people working every day for a more sustainable world. On Verso, the three influencers share informational content on our ecosystems and how to protect the environment. Viewers can explore content in three categories: "Scientifacts," "Attends, je t'explique" ("Hang on, I'll Explain") and "En route" ("On the Road"), all of which offer a wealth of insights into ecological transformation.



"VERSO IS A PROJECT ABOUT PEOPLE MORE THAN ANYTHING ELSE. IT'S THE WORK OF TEAMS OF EXPERTS AND CREATIVES, WORKING HAND IN HAND TO CREATE NEW WAYS OF COMMUNICATING ABOUT ECOLOGICAL TRANSFORMATION."

CHLOÉ CARRIÈRE



"EXPLAINING THE SCIENCE IS A GREAT WAY TO ENCOURAGE NEW GENERATIONS TO GET INVOLVED WITH THE CHALLENGES OF ECOLOGICAL TRANSFORMATION."

ANTOINE SALAÜN



“I’ve always been convinced that very few things in life are as powerful as a good story. We believe that Verso offers a different way to tell our stories, analyze, explain and demystify what is happening behind the scenes of ecological transformation.”

Robert Lozano Vergès
Director of Digital Communications
at Veolia



VIRGINIE HILSSONE-LÉVY

"CREATING NEW MEDIA OUTLETS LIKE VERSO IS VITAL SO THAT WE CAN REINVENT STORYTELLING AND PRESENT REAL-LIFE SOLUTIONS."

Subscribe!



Already over 2,3 million cumulative views

Verso is fast becoming France's go-to YouTube channel for everything to do with ecological transformation!

By presenting activities that are often little known to the greater public, Veolia is encouraging young people to consider a career in the environmental

sector and join the Group via a range of different training options, so that they can play a part in making transformation a reality.

AI helpful or harmful for the environment?

AI'S IMPACT ON THE WORLD

1 An overview of digital pollution caused by AI

What is its environmental impact?



- **25%** of the digital sector's CO₂ emissions are generated by data centers¹
- **5%** of energy demand worldwide²
- **4%** of global CO₂ emissions³



- **17,2 Mt** equivalent CO₂ and 20 Mt of waste¹
- **2,5%**: digital's share of France's carbon footprint⁴

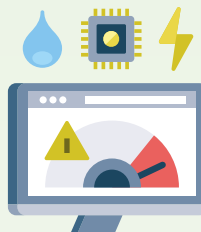
Where does its carbon footprint come from?



- **5%** of CO₂ emissions by networks
- **16%** by data centers
- **79%** by devices (televisions, smartphones, computers, tablets, printers, games consoles, smart devices, etc.)

2 Increasing resource consumption

- **x3**: the increase in energy consumption by 2050 if current trends continue²
- **1 liter of water** consumed every 50 requests to cool the data centers that power chatbots⁵
- **1,000 billion**: the number of parameters used in ChatGPT-4, requiring significant computing power
- **80** different strategic **metals** used in AI chips



3 The emergence of the first AI regulations



- **the Artificial Intelligence Act (2023)**
Aim: to regulate the use and development of AI within the EU
- **the Algorithmic Accountability Act (2023)**
Aim: to regulate AI systems in the United States at the federal level
- In France, **the AGECE law (2023)**, which aims to discourage waste and promote a circular economy, and the **REEN law (2021)**, which aims to reduce the digital sector's environmental footprint

DATA CENTER



1. ARCEP and ADEME study: "L'empreinte environnementale du numérique" [Digital technology's environmental footprint] (2022, updated December 2023).
2. "The challenges of frugal IA," Martin Koppe, CNRS News (29/11/2023).
3. ARCEP and ADEME study: "L'empreinte environnementale du numérique" [Digital technology's environmental footprint] (2022, updated December 2023).

4. Arcep: "Référentiel des usages numériques" [Reference guide to digital practices] (11 April 2023) – published by Le Pôle numérique Arcep- Arcom.
5. Study by the University of California, Riverside, and the University of Texas at Arlington, quoted by Euronews Green: "ChatGPT drinks a bottle of fresh water for every 20 to 50 questions we ask, study warns" (20/04/2023).

AI, AN ALLY FOR ECOLOGICAL TRANSITION?

1 A crucial tool to tackle the climate crisis

- **30 to 40%** worldwide thanks to AI,⁶ which can develop materials that consume fewer resources, improve carbon capture, and make farming more sustainable
- **A 15 to 30% reduction in data center energy consumption**, depending on the facility, thanks to energy-saving solutions such as optimizing computing – and storage-related consumption, virtualization, and cooling⁷
- **87% of AI and climate leaders** believe that artificial intelligence is a key tool in efforts to combat climate change⁸



2 Europe and the world: fertile ground for AI

- **40%** of jobs worldwide and **60%** in the most advanced economies could be affected, whether positively or negatively, by AI⁹
- Mexico, Moldova, and Romania are the countries with the most in-demand AI developers¹⁰
- **\$250 billion**: total investment in machine learning by the USA between 2013 and 2022, compared to \$95 bn by China and \$18 bn by the United Kingdom¹¹
- **30%** more AI engineers in Europe than in the United States and three times more than in China¹²
- **269,700**: the number of software engineers based in London, ahead of Paris, which has 74,000¹³
- **London**: Open AI's first European office
- **Paris**: 8,000 start-ups and 71 accelerators, including Station F, the world's biggest start-up campus

AI, A DRIVER OF ECOLOGICAL TRANSFORMATION AT VEOLIA

Veolia, the leading player in environmental services, is the first company to use AI to support ecological transformation in its three core business activities: water, energy, and waste. Hubgrade by Veolia is one example, encompassing solutions that combine AI, digital technology, and human expertise helping cities and industries to optimise their resource management. The Group is committed to decarbonizing resources, and systematically incorporates parameters relating to CO₂ emissions from AI. It also puts forward decarbonization solutions when developing and industrializing its solutions. "Ecological transformation goes hand in hand with digital transition. Our business and our responsibility as a leader in ecological solutions mean we have to offer our customers the solutions they need to decarbonize, depollute, save and regenerate resources," says Estelle Brachlianoff, Veolia's Chief Executive Officer.

6. "AI's growing carbon footprint," in *State of the Planet*, published by Columbia University, New York, 09/06/2023.
7. "Emerging Technologies and Trends: Use of Robots and Artificial Intelligence/Machine Learning for Cloud Data Center Operations," Gartner study (2021).
8. "AI is essential for solving the climate crisis," Boston Consulting Group, 07/07/2022.
9. IMF study: "Gen-AI: Artificial Intelligence and the Future of Work" (2024).

10. Pentalog, in a Pentablog post: "Où se trouvent les meilleurs développeurs du monde" [Where the world's best developers are located], 15/12/2022.
11. "Intelligence artificielle, le top 10 des pays où on investit le plus" [Artificial intelligence: the top 10 countries with the greatest investment], Challenges (22/09/2023) and the "2023 AI Index Report," Stanford University.
12. Sequoia Capital, "A Talented Home for AI".
13. Ibid.

The world as told by AI: opportunities and constraints of the artificial narrative



© GETTY IMAGES - ZF U/MOMENT - DIMITRIS66/DIGITALVISION VECTORS - YUICHIRO CHINO/MOMENT

R I N G



With Estelle Brachlianoff and Veolia Secure GPT*

ESTELLE BRACHLIANOFF
Chief Executive Officer of Veolia

VEOLIA SECURE GPT
Generative AI serving Veolia's employees

**The responses provided by Veolia Secure GPT are based on real prompts that were combined into single questions in order to facilitate reading.*



“Our employees possess a pioneering spirit that allows them to see the world through the prism of ecological transformation.”

Estelle Brachlianoff

Using generative AI to speed up the construction of a desirable and sustainable world. We explore this topic with Veolia Secure GPT through a series of questions that delve into technology, sustainability and inclusion, examining ways to implement ecological transformation. A narrative generated with the help of artificial intelligence (AI) commented by Estelle Brachlianoff, reflecting on the role of generative AI in the future of resource management. Read on to discover a wide-ranging exploration of innovation, worldwide collaboration, and the challenges that artificial intelligence poses to the construction of a desirable future.

Veolia Secure GPT, how do you see the world of tomorrow in terms of resource management, particularly for water, waste and energy?

Veolia Secure GPT: How do I see the world of tomorrow in terms of resource management, particularly for water, waste and energy? As generative artificial intelligence, my vision centers on the efficiency of technologies and systems. I imagine a world where advances in technologies mean resources are used more efficiently, with intelligent automation of waste and water management, and sources of renewable energies that are increasingly part and parcel of our daily lives.

Estelle Brachlianoff: I can see that Veolia Secure GPT is an optimist! That's a good start and shows that our people at Veolia have been feeding it well. But this vision of the world of tomorrow is, of course, overly simplistic. The key to the future lies in human expertise and the technologies we have to invent: 50% of the solutions already exist, but the remaining 50% need to be invented and developed. This is also where AI will prove its usefulness. I am convinced it will be key to a large number of tomorrow's concepts, as illustrated by some of Veolia's present-day solutions; one example is Hubgrade by Veolia, combining human expertise with AI. Our employees are driven by a pioneering spirit that

means they can look at the world through the prism of ecological transformation and imagine mechanisms to achieve it. I am, of course, referring to technological innovations, but that's not all. Innovation can come in many forms, it can also be contractual or regulatory. This means we need to rethink our current models, our prevailing norms and standards, so that we can minimize our environmental impact while meeting people's ever-growing needs. The road ahead of us is a long one and all stakeholders must work together if we are to build a sustainable and desirable world. And AI will have its part to play.

Veolia Secure GPT, what is your vision of a sustainable and desirable world, and what role does AI play in it?

V. S. GPT: My vision of a sustainable and desirable world is an optimistic one, focused on harmonious collaboration between people and artificial intelligence. In practical terms, this means people and AI evolving together, combining their complementary skillsets to solve complex problems and stimulate innovation. I foresee a convergence of technology and sustainability as part of this. Smart networks using AI to predict and optimize energy usage, infrastructure with smart sensors fitted so that resources can be managed proactively, and drones to monitor ecosystems. As I see it, a desirable world will be a place where technology works for the benefit of humanity, where fairness is the norm, and nature coexists alongside our activities.

E. B.: I share this vision. But I must also stress the importance of the human aspects of this transition. Technology must serve people, not the other way around. There is clearly a role for AI to work alongside humans. We have recently launched Hubgrade by Veolia, a range of services combining human expertise and AI used to optimize our customers' energy efficiency, among countless other innovative services. The world of tomorrow must also be inclusive, taking account of the needs of every community and guaranteeing that nobody is left behind. A desirable world will be one where everybody has access to clean water, efficient waste management and a sustainable, local source of low-carbon energy. And where biodiversity is preserved, communities are resilient, and we all share a sense of responsibility for our planet. This involves cooperation on a global scale and partnerships between actors from the public and private sectors. Finally, I believe that a desirable world will be a place where the environment will not be sacrificed for the sake of progress – but neither will progress be sacrificed for the sake of the environment. We can find a balance between human progress and protection of our planet. This demands approaches to urban planning that respect the environment, preserve natural spaces, and promote sustainable lifestyles. It is also essential that efforts are made to promote an economy that values quality above quantity, that focuses on sustainability, not growth at all costs. ▶

Appointment

Speaking of inclusion, how can we ensure that future generations will benefit from equitable access to the resources they need to live life to the full?

V. S. GPT: Education is crucial to making sure that future generations understand environmental issues and are prepared to tackle challenges surrounding sustainability. By educating young people about concepts such as preserving resources, waste management and environmentally responsible behavior, we will produce citizens with a greater awareness of their impact on the environment. Personally, I feel it is essential to teach younger people about the impacts of digital and AI, which together account for 4 to 5% of global energy demand! We therefore need to learn to be reasonable and restrained when it comes to our use of digital tools. I also think that transitioning to a circular economy is another promising approach. Encouraging waste reuse, recycling and reduction can help minimize ecological footprints and make sure that resources are used more efficiently. This will require significant changes to our business models and close collaboration between governments, businesses and civil society.

E. B.: Education is key. We need to teach future generations about environmental issues and give them the skills they need to design, implement and maintain sustainable solutions. At the same time, our business models need a rethink that will shift them toward a circular economy model that encourages reuse and recycling. This will help guarantee equitable access to resources. We have just inaugurated Terra Academia, our school for professions related to ecological transformation. With campuses currently in Arras and Paris and set to open around the world, the school will promote jobs and professions dedicated to these essential services. Together, education and transformed business models can play an essential role in the creation of a more equitable and sustainable future. I am curious to know how you will reply when asked about sustainability and collaboration between stakeholders.

How can we encourage governments, businesses and private individuals to collaborate to deliver a shared vision of sustainability?

V. S. GPT: Building this type of world demands concerted action. One real-world example might be the creation of public-private partnerships for the development of sustainable infrastructure. For example, collaborations between local government and businesses to set up renewable energy networks or smart waste management systems.

E. B.: Collaboration is certainly crucial and the fact it is mentioned in the AI's answer is a good thing. It shows there is consensus on this topic. We all have a role to play and if we are united, we will be stronger when it comes to tackling the massive challenges that lie ahead. Veolia is committed to ramping up dialogue with its

stakeholders as part of GreenUp, its new strategic plan. As well as building productive alliances, the Group also intends to leverage public opinion to help shift the dial and accelerate ecological transformation. Governments must play their part too and put in place policies to make sure the most responsible economic actors are incentivized. For their part, businesses need to embed sustainability in their business models and commit to clear targets. Lastly, citizens need to do their part by making informed choices and holding businesses and governments to account.

And finally, is the incorporation of generative AI into our daily lives an evolution or a revolution?

V. S. GPT: The incorporation of generative AI into our lives is cause for debate between those who see it as a natural evolution and those who believe it to be a transformative revolution. This technology, which can generate original content as text, images or even music, offers new possibilities in a broad range of fields including artistic creation, product design and virtual assistance. Some people are keen to stress potential advantages in terms of productivity, personalization and efficiency. Others worry about the ethical implications, loss of traditional jobs and a growing dependency on machines. This highlights the fact that whether generative AI is an evolution or a revolution depends to a great extent on how society adapts its norms, regulations and values to oversee what is a fast-expanding technology. I tend to think, if I have to give an answer, that it is a tool that will revolutionize the ways we work!

E. B.: The introduction of AI unarguably marks a revolution in how we approach the way we work and manage projects, delivering significant gains in efficiency, speed and innovation. But it is vital to remember that despite its advances, AI cannot replace the human spirit when rolling out ecological transformation. The women and men engaged on this mission have the deep-rooted understanding, sensitivity and creativity indispensable to tackling complex environmental challenges. AI can certainly enhance and optimize processes, provide in-depth analyses and help with decision-making, but it is unable to reproduce the emotional and ethical engagement and strategic vision that are intrinsically human. So, we should not think of AI as a replacement but as a valued partner in the shared quest for lasting ecological transformation, with humans at the helm to guide and give meaning to this technological evolution. ▀

“We need to make future generations aware of environmental issues and equip them with the skills needed to design and implement sustainable solutions.”

Estelle Brachlianoff



ARIS

Meet some of Veolia’s employees from around the world

Ariska, Florian and Dorottya are part of a community of 218,000 Resourcers that “want the world to be as it could be.” Optimistic, determined, and always together, they are fully committed to ecological transformation. They are part of a series of portraits to follow on veolia.com.

Ariska

Sustainable Development Supervisor
Pasuruan plastic recycling unit

“The circular economy sets an example for businesses,” says Ariska by way of welcome. “We must be responsible for our production by avoiding environmental contamination and creating new raw materials with our waste,” she continues, aware of the challenge in a country ranked in the top 5 contributors of plastic waste to the oceans, which has committed to reducing its volumes by 70% by 2025.

Giving plastic waste a new lease of life is precisely what Ariska does every day. The Pasuruan plant (east of Java) operated by Veolia recycles more than 25,000 metric tons of food-grade PET (polyethylene terephthalate) a year. After shredding, the plastic is transformed into granules, a high-quality secondary material that is resold to manufacturers. This innovative practice reduces waste and limits the use of virgin raw materials, which still account for 98% of the world’s plastic production. “Besides Veolia Indonesia’s commitment to reach 100%

sustainable feedstock, we are working toward a socially responsible supply chain from our informal waste collectors,” enthuses Ariska.

To support this transition, Ariska’s mission is to implement awareness-raising programmes and organize training for Veolia’s suppliers. The aim is to share the benefits of the circular economy model and seize the opportunities arising from its application. Ariska’s commitment extends beyond the professional sphere: “We are all responsible for our actions toward the community.” Sharing and educating the students on Indonesia’s major challenges, including the country’s waste management system and recycling process, is one of Ariska’s main objectives. By doing so, she enables future generations to learn how to do their part in recycling and have a positive impact.

A supporter of an optimistic scenario, Ariska encourages her generation not to turn their backs on reality: “I belong to the Generation Z,

the youngest generation in the working world, and I encourage them to think about the impact that our actions will have on the environment and living beings.” This awareness spurs on the young Resourcer, who is involved in ecological transformation on a daily basis. ▶

Listen to Ariska tell her story



“Generating energy from wastewater is a game-changer!”

Florian

Maintenance Technician
La Baumette wastewater treatment plant

Florian joined Veolia as a 20-year-old apprentice in 2007. Ever since, he has worked at La Baumette wastewater treatment plant (WWTP), which handles 90% of wastewater for the Angers metropolitan area. Driven by his passion for the environmental sector right from the start of his journey with Veolia, Florian is now a maintenance technician specializing in metrology, automation, and control. His daily work involves maintaining and cleaning the site’s facilities and equipment (including valves, pumps, and filters), and ensuring that all stages in the treatment process continue running 24/7 to help avoid breakdowns. This role is known as preventive maintenance. “It’s a bit like looking after your car!” Florian explains. “I’m a sort of doctor for the machines – I analyze what causes faults, sometimes going back through the entire process chain, then I find a fix, a solution.”

For Florian, being a Resourcer “is more than a title – it’s what drives me.” And it’s a big task for him and his colleagues. Some 30,000 cubic meters of water pass through

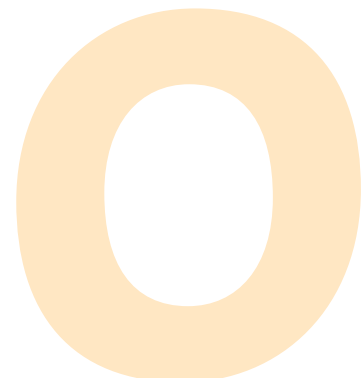
the plant for treatment each day before being released into the Maine, a tributary of the neighboring Loire River that flows through a valley listed as a UNESCO World Heritage Site. Without this treatment, there would no longer be any aquatic life. “Access to drinking water is vital for people, and water treatment is just as vital for nature.”

Improving the quality of the effluent discharged into the environment is one of the challenges the plant faces on a daily basis. It already recovers its sludge and, after drying it out, sells it in a variety of forms to local farmers for use as fertilizer.

The quest for new solutions to optimize sludge recovery led to the idea of using the biogas released during the digestion process (methanization) to provide green energy to nearby local authorities. “As the sludge is heated, it produces methane, a natural gas. Following purification, this biomethane, with properties identical to natural gas, is injected into the Angers distribution network, offering residents a local, low-carbon energy source.”

“This is where I began my journey, which has provided me with opportunities for growth and development. At the forefront of environmental issues, Veolia is consistently innovating for tomorrow’s solutions, which means there is a continuous influx of more effective technologies to master!” Despite not having children yet, Florian takes pride in helping leave “a livable planet” for the next generation. ▶

Listen to Florian tell his story





RIANI



DORO

“Producing membranes to eliminate water pollution is a game-changer!”

Dorottya

Production Supervision Team Leader
Oroszlány site

“When I was little, I used to dream of having a job where I felt I was doing something for the planet,” says Dorottya. No doubt influenced by long getaways in the bountiful Hungarian countryside, rich in waterholes and thermal and mineral springs. A dream come true. Now a chemical engineer with a degree from the Budapest University of Technology and Economics, Dorottya works for Veolia in Europe’s largest water treatment membrane production plant.

Described as a center of excellence, the site at Oroszlány, 80 km west of Budapest, specializes in hollow-fiber ultrafiltration membranes. “The first stage,” explains Dorottya, “takes place in the braiding workshop, an operation that improves the mechanical strength of the fiber. Then comes the actual production.” The secret to this complex job with strict quality control lies in good team management: “Membrane manufacture is a very delicate process that requires the coordination of numerous tasks,

and therefore a perfect group dynamic... It’s up to me to make sure that my team is close-knit and works well together!”

To meet the growing demand for water, Veolia is constantly innovating in technologies that improve the filtration of the pollutants it contains, encouraging reuse of the resource. “Membrane filtration is a low-vacuum applied separation method that does not require the use of chemicals,” says Dorottya. Water is sprayed through these semi-permeable membranes, which are capable of stopping all particles larger than one hundredth of a micrometer, or 0.00001 mm, such as bacteria and viruses. This technology can be applied to different qualities of water – groundwater, surface water or wastewater – regardless of its initial quality.

Although Dorottya never imagined that she would one day be turning wastewater into clean water, the “Resourcer” she has become

recognizes this achievement as a great success. “I appreciate my work here even more. We’re making a product that’s useful to everyone, everywhere in the world.” ▶

Listen to Dorottya tell her story



Focus

SOLUTION

**Artificial
Intelligence**

TIONS



SUS-

Hubgrade by Veolia, an accelerator of ecological- transformation

TAINNA-

The Hubgrade by Veolia range of solutions, which until now has been geared toward the Group's operational needs, is now evolving into a service offering accessible to cities and industrial companies integrating the power of data, artificial intelligence (AI), and the know-how of the Group's experts. The aim is to optimize the management of crucial resources and save them in the long term. An overview of a new pillar of innovation at Veolia.

B

TURE

Key figures

More than **60** Hubgrade monitoring centers in 20 countries

Over **10,000** Veolia-operated sites already connected

450 data scientists and experts

10 million intelligent sensors

Issue at stake

Apply artificial intelligence and human expertise at the service of water, energy and waste management.

Objective

Provide artificial intelligence solutions that accelerate the ecological transformation of cities and industries.

Veolia's solution

Hubgrade by Veolia is redefining the landscape of environmental resources management with a new range of digital services blending AI and the excellence of human expertise.



3 questions to Aude Giard

Group Digital Director at Veolia

Why did you develop this new range of digital services and what sets it apart?

Aude Giard: Firstly, we must remember that Veolia has been leveraging the power of digital technology for years to deliver effective and cost-efficient environmental services to its clients, municipalities, industrial companies, and commercial companies. For a long time, our teams have supervised water production and treatment plants to guarantee their quality, used advanced software techniques to optimize waste treatment, and analyzed billions of energy consumption data from buildings to reduce our clients' electricity and gas bills.

The evolution of digital technologies, and particularly the development of artificial intelligence, has allowed us to launch this new range of digital services, which we call Hubgrade by Veolia. With Hubgrade by Veolia, we are addressing more advanced use cases in our water, energy, waste, and environment businesses and providing better benefits our clients

and our teams in their operations on behalf of our clients.

What makes Hubgrade by Veolia stand out for Veolia's clients?

A. G.: The first differentiator of the Hubgrade by Veolia offering is the innovation made possible by our ability to collect, organize and analyze all the activity data from all our businesses. Analyzing these billions of data now allows us to feed innovative AI algorithms, which improve our efficiency in serving our clients. Secondly, Hubgrade by Veolia cuts across all our businesses. Hubgrade is applied to a scope of over 100 use cases in the water, energy, waste, and environment businesses, where our digital services provide tangible and measurable benefits. With Hubgrade by Veolia, our clients enjoy a real partnership across all water, energy, and waste businesses to assist their ecological transformation, decarbonization, resource management, and pollution control of their industrial or municipal facilities.

And finally, our digital services are proven. They are tested, validated, and their benefits certified on our own water management, waste treatment, or energy efficiency control facilities. They are robust and industrial and benefit from the technological excellence, cybersecurity, and industrialization methods developed by our Digital Business & Technologies Department (DB&T).

How do AI and human expertise complement each other?

A. G.: In our businesses, and particularly when we commit to performance with our clients, AI cannot be approximated. So firstly, AI must be trained and verified by experts before being put into production. And then, at Veolia, the customer relationship is essential. Here, AI assists our expert teams in answering all the complex questions that arise in our clients' ecological transformation and decarbonization projects. ▶



Optimizing performance with Coca-Cola Canada, a Hubgrade success story

Production variation in the factory was having an impact on the quality of wastewater, leading to non-compliance events. Coca-Cola was struggling to maintain the pH of the effluent between 6 and 10. By the end of 2019, Coca-Cola implemented Hubgrade, a system that brought about significant positive changes

to their operations. Hubgrade provides Coca-Cola with a real-time overview of equipment, alarms, and documentation in their plant. Thanks to this solution, they are now better informed and able to make faster and more knowledgeable decisions to optimize their facility. One particular benefit is that, Hubgrade

allows Coca-Cola to access support from Veolia Water Technologies' experts for real-time monitoring, alarm management, swift resolutions, and much more. Veolia is thus making a major contribution to the continuous improvement of Coca-Cola's operations. ▶



t's the story of a first. By unveiling the large-scale deployment of Hubgrade by Veolia at the 2023 international Smart City trade fair in Barcelona, Veolia has demonstrated its ability to provide digital services as opportunities to pilot the production and consumption of water, energy, and waste. The Group is also the first to rely on AI to achieve this and open a door for partners to a revolution that has already proved its worth internally. "It is the fruit of a historic and strategic investment for Veolia. Veolia has been investing in the progressive and secure cloudification of its infrastructure and the digitalization of its businesses for more than ten years, in particular to be more efficient in the Group's operations and stand out in its customer relations. Building on its successes, Veolia is now seeking to accelerate and take advantage of data and AI. These cutting-edge technologies, combined with our global expertise in the three areas of Water, Waste and Energy, should allow us to measure the environmental impacts of our decisions better, and accelerate our customers' ecological transformation," explains Aude Giard, Group Digital Director at Veolia.

A UNIQUE, TARGETED APPROACH

Veolia is bolstering this lead over other market players worldwide through high-performance solutions available to its customers: these include preserving water resources at every stage of its cycle, through real-time monitoring of facilities, treatment plants, distribution networks, and meters, as well as optimizing energy production by monitoring production sites and heating and cooling networks in real-time. Hubgrade also enables the deployment of energy flexibility mechanisms for industries and buildings thanks to high-performance algorithms, as well as the reduction of buildings' consumption by identifying energy wastage, optimizing the operation of heating, air

conditioning, lighting, and ventilation systems, and indoor air quality optimization, which has a direct impact on users' health. Finally, it offers improved waste recovery thanks to camera identification, guaranteed traceability, and better adaptation to the logistical challenges faced by manufacturers and local authorities.

A COMPETITIVE EDGE...

This wide range of services enables the Group to stand out from the competition and offer augmented benefits to its clients. "Innovation represents the very first lever at the heart of this approach," explains Aude Giard. Hubgrade has inherited a dual DNA: on the one hand, the world of data-driven digital performance, and on the other, the world of human expertise and excellence that the Group has been fostering for 170 years. This duality creates an unrivaled offering: digital solutions and data analytics combined with an international team of experts working in partnership. In principle, all the solutions are first tested on Veolia assets and scaled up to demonstrate their value before being offered to external customers. As a result, municipalities

"Hubgrade brings together our capacity for innovation and our digital know-how at the crossroads of our three core businesses – water, waste and energy – enabling us to support our customers in managing their resources more intelligently, safely and sustainably."

Estelle Brachlianoff

and industries benefit from a globally tested and locally adapted set of environmental resource management solutions, combining innovation and efficiency. Finally, the Hubgrade Digital Services are cross-sectoral. Each digital solution, whether in water management, energy optimization or waste handling, benefits from the smart technical architecture, data models, data governance, algorithms, security, scalability, usability and compliance principles learnt and implemented on other successful digital solutions. "At Veolia, we are determined, thanks to data, AI and our environmental expertise in water, energy and waste treatment, to offer Hubgrade cross-disciplinary services that provide our clients with a coherent and comprehensive response to their environmental challenges," continues Aude Giard.

... AND A STRIKE FORCE

A truly high-performance tool, Hubgrade is supported by a dedicated organization. Thanks to the power of data and digital technology such as AI, Hubgrade's offering enables not only high-performance operations, but also co-creative solutions. Merging the wisdom of the Group's experts with advanced algorithms and solutions ensures that every challenge our customers face leads to a positive outcome as well as an opportunity for innovation. As French local authorities have to comply with waste stream purity standards, the Hubgrade by Veolia offering helps both municipal and industrial customers comply while achieving impressive results. A major French metropolis has decided to implement automated sorting – via AI – and flow characterization

Focus

that reaches 90% in its innovative recycling center located in Bègles. Likewise, wastewater quality management at Coca-Cola's Canadian facility in Weston has been facilitated by Hubgrade since 2019. It allows technical issues to be resolved and non-compliance incidents mitigated through the real-time monitoring and optimization of water treatment operations and processes.

AI IN THE NETWORK

Working closely with the Emirati leader in retail and leisure centers in the Middle East, Africa, and Asia, Veolia has contributed via Hubgrade to the development of an energy efficiency plan covering 15 of its centers across five countries: the United Arab Emirates, Oman, Bahrain, Lebanon and Egypt. A detailed roadmap identifies measures for optimizing existing systems and opens up the possibility of reducing energy and electricity expenditure by 8.2% and 8.7% respectively. Not to mention a significant improvement in carbon footprint. Hubgrade Carbon Footprint is the digital service, using a digital platform: a site's entire process is modeled, covering truck arrivals and departures, chemical product flows, energy consumption, etc. The platform graphically reproduces the site's activity and proposes sustainable projections, such as CO₂ reductions over several years or the implementation of geothermal or solar solutions. Hubgrade Carbon Footprint therefore promotes and facilitates access to the ecological solutions in Veolia's catalog. Hubgrade also includes predictive maintenance assistance, continuous facility monitoring, and water leak detection.

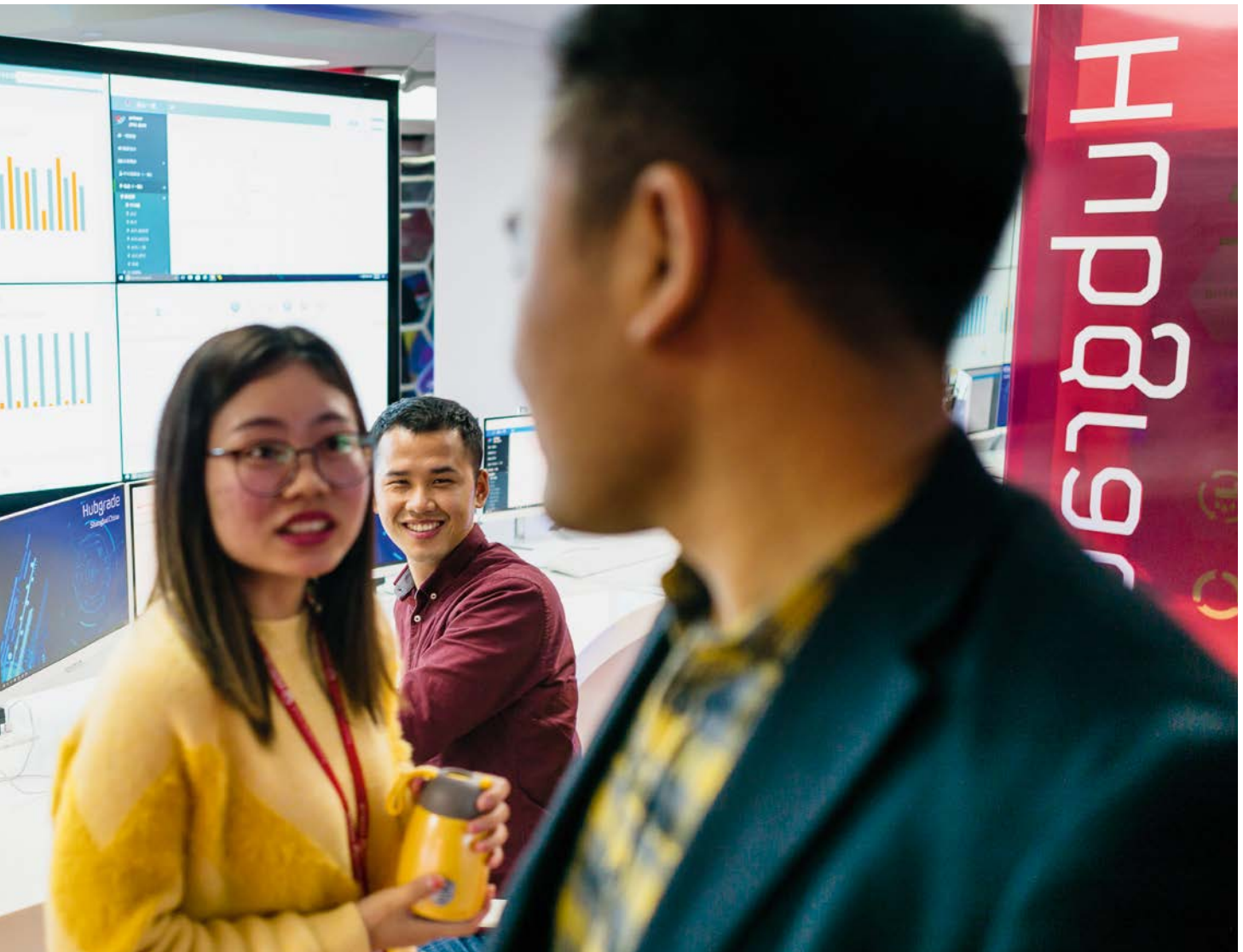
In this way, the evolution and growing richness of the Hubgrade catalog is fuelled by the success of concrete projects. This generative capacity is one of the offer's key strengths: it is the direct result of integrating artificial intelligence into its design and operation, without ever forgetting Veolia's human expertise. "At Veolia, we are convinced that ecological transformation goes hand in hand with digital transition," comments Estelle Brachlianoff, Veolia's Chief Executive Officer. "Our business and our responsibility as a leader in ecological solutions commit us to providing our customers with the tools they need for the pathways of decarbonization, depollution, resource saving and regeneration. Hubgrade brings together our capacity for innovation and our digital know-how at the crossroads of our three core businesses – water, waste and energy – enabling us to support our customers in managing their resources more intelligently, safely and sustainably." ▶



© ALEXANDRE DUPEYRON / VEOLIA MEDIA LIBRARY

“Our aim is to provide our customers with a coherent and comprehensive response to their environmental challenges through the services offered by Hubgrade by Veolia.”

Aude Giard





OPERATIONAL AI: accelerating transitions for cities and industry alike

Veolia has been putting artificial intelligence (AI) technology at the heart of its daily water, energy, and waste activities for over a decade. AI is now a core part of the solutions that the Group offers to all its industrial and municipal customers, helping them achieve their targets and bring about ecological transformation. The technology developed by Veolia drives environmental performance and operational excellence as it accelerates the ecology of solutions for a desirable and sustainable future.

Key figures

150 experts
in Veolia's AI community from
40 different countries

More than **2,000**
energy facilities piloted by Hubgrade
in Bilbao (Spain)

-10%
leakage in France's drinking water
network, thanks to Leak Tracker

200 objects/sec
the Portik solution's speed at detecting
the nature of each piece of waste

Issue at stake

Capitalize on AI's ability to optimize maintenance and streamline Veolia's operations in its three business activities.

Objective

Offer effective solutions to industrial and municipal customers to help them make their decarbonization, depollution, and resource regeneration pathways a reality while limiting their costs.

Veolia's solution

Use actual needs identified in the field to create products and services that incorporate the Group's unique technical expertise in its three business activities.



3 questions to Karl O'Hanlon

Chief Data & Analytics Officer

How is AI a source of opportunities for Veolia?

Karl O'Hanlon: AI allows us to consolidate our know-how in the fields of water treatment, waste, and energy. It is also a valuable tool for creating synergies between these three sectors, as some approaches can be transferred from one to another. Among the many benefits that arise, I can think of the challenge of regulatory compliance and improving ecological impact – both for the Group and its clients. But AI can also be a very useful vector of operational excellence, especially when it leads us to reflect on the evolution of certain professions or even accelerate the implementation of these changes.

How is the subject of "Artificial Intelligence" being addressed internally?

K.O'H.: Veolia must rely on its own AI skills. Without them, we would not be able to question the solutions proposed by external players or reliably estimate their added value. We can now rely on a community of some 150 international experts, from different sectors and representing about forty countries. It is a forum to discuss current projects, technologies used, and share feedback. Gradually, a mix of expertise is emerging, both in the field and digital, which helps highlight optimization paths of interest to all our activities.

What is the outlook?

K.O'H.: The performance of the current AI models is closely linked to the quantity and quality of data that can be exploited. Given the number and variety of facilities and buildings it operates, Veolia has an invaluable asset that has already led to significant achievements. To go faster and further, the priority is to set up a partnership structure. It will allow us to rely on the firepower of the big cloud players and their technological platforms but also initiate strategies aimed at meeting regional needs in contact with a selection of start-ups. ▶



Leak Tracker and Portik, using AI to optimize waste sorting

With the Leak Tracker device, developed by Veolia and Alcom Technologies, operators have a complete toolkit to detect any kind of anomaly in piping systems and intervene rapidly. The e-tracking approach can also be extended to the detection of energy consumption drifts, particularly in water treatment plants. The results are significant: a 10% reduction in leaks and energy savings of

around 15%. Veolia is implementing this solution at approximately 3,000 sites across France. The results are just as significant with Portik, a Veolia innovation dedicated to waste sorting. Commissioned in 2023 at the new-generation, ultra-efficient sorting center in Bègles (France), Portik is equipped with a camera and a real-time analysis system of the composition of waste streams

anywhere on the sorting line. Jeremy Lagorse, Head of the AI and Analytics team within the Digital Business & Technology department, points out that "thanks to a database of waste images driven by AI, the Portik solution is capable of detecting the nature of each object, at a rate of four images per second or 200 objects per second." ▶

U

sed for a multitude of tasks, from ensuring infrastructure is operating correctly to reducing buildings' energy consumption and managing water networks, data analysis plays a crucial role in optimizing industrial processes and services to local authorities. Every piece of data has its "hidden side" – useful information that you need to know how to find and decode in context. In other words, the data has the potential for transformation, but since this potential is not immediately visible, revealing it requires significant analytical power. "At our customers' sites, each measuring point generates a huge amount of data," notes Philippe Seberac, Technical and Water Performance Director at Veolia. "In a location with several dozen sensors, there's so much data that it's hard for the human brain to process it all. That's why we need tools capable of bringing all that data to life. And that's where artificial intelligence comes in."

Artificial intelligence encompasses the broad range of techniques designed to give machines simulated human intelligence. It often takes the form of systems capable of perceiving their environment and acting on their perceptions to achieve predefined goals. Examples include robot solutions like Max AI® (BHS) and SamurAI® (Machinex), which Veolia uses in several waste sorting centers in France, such as Amiens, Nantes and Bègles.

IMAGES AND VIBRATIONS

Combining two optical cameras with an articulated arm, the Max AI® and SamurAI® systems use a neural network embedded in a computer and connected to the sorting line. To make sure these systems run smoothly, they require constant updates to their databases – which already include hundreds of thousands of images – just like a human would constantly keep up to date with the latest information. "Currently, in France, the material produced from household waste packaging has to meet purity levels set out in specifications from eco-organizations when it leaves the sorting plant. If it doesn't meet these purity levels, penalties are applied," explains Philippe Seberac. "Using AI algorithms means we can automate some of the work of detecting non-compliance and categorizing waste while acquiring information

at a faster rate." The key benefit is that performance issues can be identified at an early stage and the way that the line is managed adjusted accordingly. The Bègles sorting plant, which was modernized in 2023, is now one of France's best-performing facilities!

In another context, the wastewater treatment plant in Angers, France, uses Bob Assistant, a smart unit that has proven its effectiveness as a predictive maintenance tool. It specializes in sensing and analyzing vibrations from select critical equipment. The system learns fully autonomously and can determine the "vibration signature" of each piece of equipment, identifying the early signs of breakdown. The result is an improved – and potentially cheaper – approach to maintenance: for example, changing the filter in an air handling unit when it starts to become clogged rather than in line with a fixed maintenance schedule.

SPECIALIST EXPERTISE: A KEY SUCCESS FACTOR

Specialist expertise remains a crucial factor in making Veolia's AI solutions a success. Although they are created by developers and data scientists, these solutions primarily draw their strength from the skills of the experts who use them. The tools designed for drinking water plants and wastewater reuse facilities are one example. Specialist experts, developers, and data scientists worked

together closely to create the solutions now marketed by the Group. One of these solutions, Hubgrade Smart Membranes, focuses specifically on reverse osmosis filtration systems. Its tasks include monitoring the condition of membranes in real time and continuously assessing the quality of cleaning, a key

factor in their lifespan. "There are multiple benefits for customers," says Hind Hafdi, Head of Digital Strategic AI and Marketing at Veolia Water Technologies & Solutions. "The indicators we provide to our customers help them not only take action in time to avoid unscheduled shutdowns, minimizing operating costs, but also limit their use of chemicals, in turn lowering their environmental footprint."

Another service, Hubgrade Smart Clarification, is designed to improve the water clarification process. It uses optimization algorithms to recommend the ideal volume of chemicals needed to achieve the required water quality at the end of the process.

"We need to let all the data we have speak for us. That's where artificial intelligence comes in."

Philippe Seberac

IDENTIFYING RELEVANT USE CASES

AI is increasingly interconnected with Veolia's core business activities and is central to the Hubgrade range of digital services. This smart monitoring solution accelerates ecological transformation for cities and industry alike, supporting them as they develop more effective, secure, and sustainable resource management. In Bilbao, Spain, over 2,000 energy facilities, comprising almost 1,000 buildings, 60 industrial sites, and 20 heating and cooling networks, are currently monitored and managed using Hubgrade. The Hubgrade management center serves as a control tower for the entire network, providing continuous remote monitoring across all sites.

The list of potential areas of application suggests that the role of AI in the Group's business activities is set for unstoppable growth. "The aim isn't to end up pushing technology based on the principle that current or future innovations will necessarily create or identify needs," says Anne-Sophie Lepeuple, Head of Water Domain at Veolia's Digital Business & Technology division. "The first step is always to go and meet with operators, get to the bottom of the issues they face, and work out how fine-tuning operational system management could create value. Today, more than the technology itself, AI's contribution to our work at Veolia depends on correctly identifying use cases!" ▶

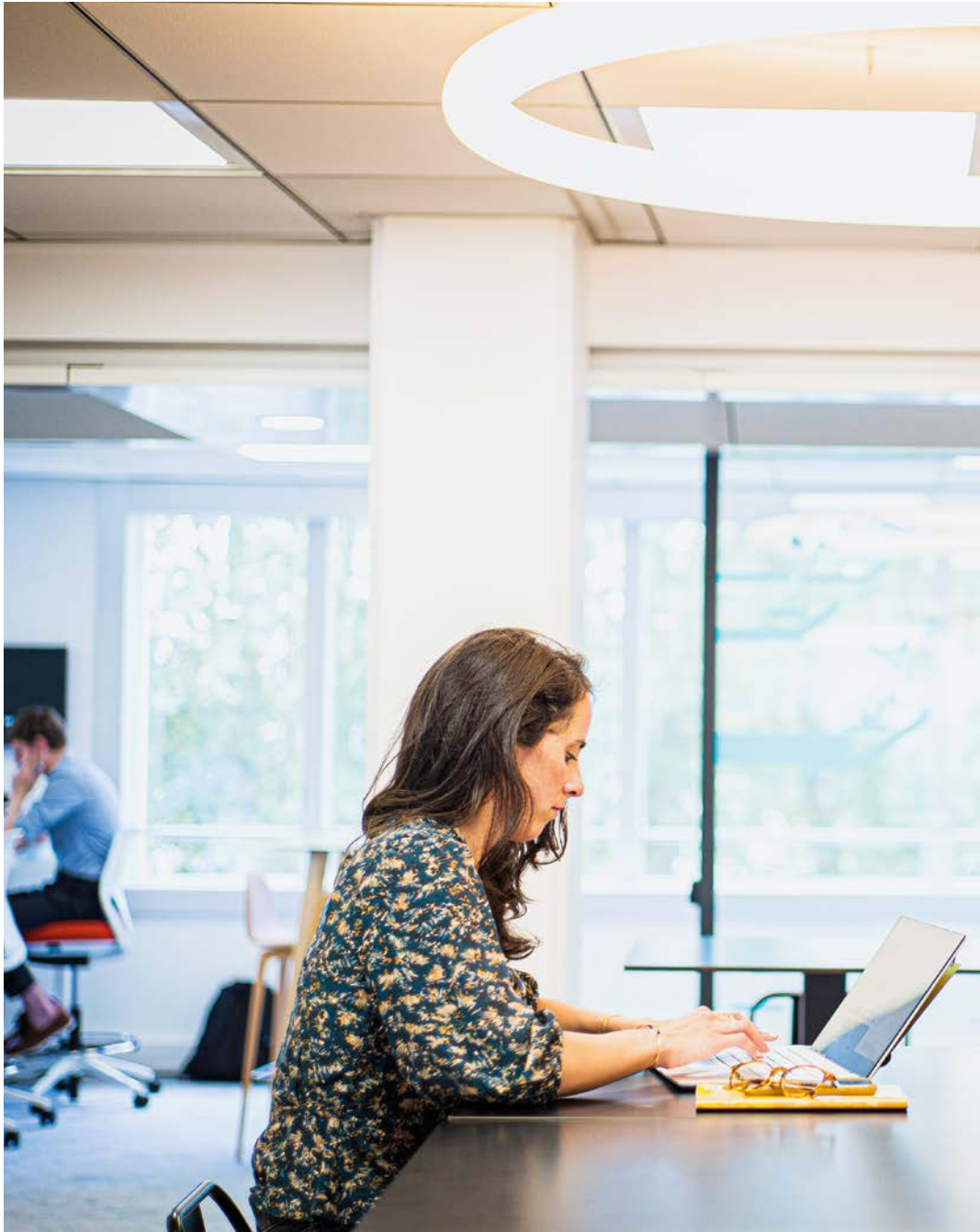


© OLIVIER GUERIN / VEOLIA MEDIA LIBRARY

“The indicators we provide to our customers help them take action in time to avoid unscheduled shutdowns [...] in turn lowering their environmental footprint.”

Hind Hafdi





GEN- ERATIVE

Veolia Secure GPT: boosting efficiency with AI

A With the launch of Veolia Secure GPT, Veolia is once again demonstrating its pioneering approach to technology and digital transformation. The new tool is a secure personal assistant that uses generative AI and has been designed specially to support Veolia employees in their everyday tasks. It is a significant milestone in Veolia's digital strategy, which has already seen the Group migrate most of its applications to the public cloud in 2015 and launch the SATAWAD program that has revolutionized workstation digitalization. Following the success of its digital transformation, Veolia is now looking to leverage the advantages of generative AI to boost the operational efficiency of its workforce by transforming them into "augmented" employees. Let's take a closer look at this groundbreaking initiative.

Key figures

0,1 g of CO₂

is the environmental footprint of a prompt (query) generated by Veolia Secure GPT

1 million prompts

created since Veolia Secure GPT launched in October 2023

80%

of users trained in Veolia Secure GPT by end of 2024

60,000

daily Veolia users of the Veolia Secure GPT platform

Issue at stake

Guarantee that data is secure, meet the specific needs of Veolia's business activities, and implement a custom solution as part of its digital transformation while reducing the risks associated with using public generative AI.

Objective

Take advantage of the services AI offers to help employees carry out their most time-intensive tasks and boost their productivity, including by automating certain processes and predicting changes in patterns of use.

Veolia's solution

Roll out Veolia Secure GPT, a secure generative AI tool that took only a few weeks to develop, giving Group employees a chance to familiarize themselves with the technology by integrating it into their day-to-day digital working environments.



Clear governance for AI and its rollout

Stuart Stock, Head of Digital Business & Technology at Veolia

"We're working on a new governance model for AI at Veolia that will allow us to manage risks and benefit from the transformation opportunities the technology offers," explains Stuart Stock. "Our aim is to encourage the use of secure, approved tools so we can keep our data assets protected." Veolia's AI governance aims to centralize requests, maximize their potential and implement a copy & adapt strategy that will

benefit the Group as a whole. A three-part support program has also been put in place to help employees get used to the new tools and develop their skills, provide a catalog of Veolia-approved generative AI tools, and raise awareness of new roles within the organization. "We're rolling out online training programs at the business units, teaching local trainers to run two-and-a-half-hour workshops on generative artificial intelligence.

The idea is to give employees a basic understanding of the subject in general, not just the technology but also how to get the best out of Veolia Secure GPT." ▶



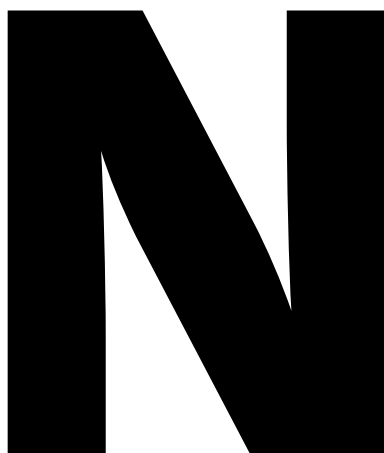
Will AI create jobs?

According to a study by the International Labour Organization,* a United Nations agency, looking at the consequences of the rise of tools such as ChatGPT, "most jobs and industries are only partly exposed to automation and are more likely to be complemented rather than substituted by the latest wave of generative AI." In the view of the ILO, "the greatest impact of this technology is likely to not be job destruction but rather the potential changes to the quality of jobs, notably work intensity and autonomy." For Veolia, determined

to ensure that technology and innovation work to serve ecological transformation and people, the goal is not to shrink its workforce but to improve job quality. For example, fewer and fewer people working at waste sorting centers need to handle the waste themselves as the task is increasingly performed by waste-sorting robots. This improves working conditions and makes people's work safer and less physically demanding. The alliance between ecological transformation and artificial intelligence therefore delivers better-quality jobs

and can even create new ones. According to Stuart Stock, Head of Digital Business & Technology at Veolia, "generative AI will rapidly transform the industrial landscape, leading to structural changes that are likely to impact jobs and skills as well as ecological footprints. But it will also create new jobs and be a source of new challenges." ▶

* Generative AI and jobs: A global analysis of potential effects on job quantity and quality, ILO, August 2023.



November 30, 2022: OpenAI, a company specializing in natural language processing and artificial intelligence, launched ChatGPT, a generative artificial intelligence service available to the general public. A revolutionary tool whose accessibility and ability to generate quality content in a few seconds sent shockwaves through the digital ecosystem. ChatGPT received over a million signups within the first five days and barely 12 months later the trailblazing tool was answering over 10 million natural language requests from around the world every day.

TECHNOLOGICAL POSSIBILITIES & DATA SECURITY

Today, ChatGPT and similar tools deliver answers to hundreds of millions of private and business users in an ever-growing range of fields: fact searches, summarizing and arranging content, and generating images, computer codes, and even videos. Veolia is a pioneering Group responsible for the security of its data and its employees' data. Therefore, in November 2022, its IT teams had already begun to examine how to make a secure in-house tool available to help Resourcers in their work. Julien Largillière, Group Chief Technology Officer at Veolia, explains that "because information that is shared is then used to enrich public generative AI models, we needed to find a way to protect Veolia's data assets without depriving our teams of the technology's amazing potential." The solution? Developing a dedicated application to act as a secure alternative that meets the specific needs of Veolia's business activities while reducing the risks associated with public generative AI. The development work meant that Veolia Secure GPT was ready for launch in the summer of 2023. According to Stuart Stock, Head of Digital Business & Technology at Veolia, "With the launch of Veolia Secure GPT in the summer of 2023, the Group demonstrated its pioneering character. Today,

“With the launch of Veolia Secure GPT in the summer of 2023, the Group demonstrated its pioneering character. Today, over 60,000 employees use the platform on a daily basis. A figure that should double in the coming months as we raise employees' awareness and understanding of the tool.”

Stuart Stock

over 60,000 employees use the platform on a daily basis. A figure that should double in the coming months as we raise employees' awareness and understanding of the tool.”

DATA TO SUPPORT AN “AUGMENTED” WORKFORCE

Veolia is at the forefront when it comes to viewing data as a resource that can be used to advantage in a wide range of applications. “We have access to an abundance of structured and unstructured data we could easily make better use of,” says Stuart Stock. “We continue to work on a large number of AI algorithms to analyze the massive amount of data gathered by our millions of sensors and our monitoring systems used to decarbonize, depollute, and regenerate resources.” Smart household waste sorting, drinking water treatment, leak detection and predictive maintenance for water distribution networks, Veolia's Hubgrade solutions for smart resource management: there is a broad line-up of innovative solutions in all three of Veolia's core business activities, solutions that are boosted by the power of AI algorithms and predictive analytics. And

now, thanks to Veolia Secure GPT, the productivity of colleagues in so-called support functions (IT, HR, finance, purchasing, legal, marketing, and communication) is entering a new era. This is the dawn of the age of the augmented employee, an important feature of the Group's digital strategy. Stuart Stock explains that “our tool is designed to free users from the more mundane aspects of their work so they have time to focus on high added-value tasks.” Offering efficiency comparable to other public GPT tools,¹ the tool that Veolia has developed features a conversational interface allowing users to generate a wide variety of text-based content, from drafting and summarizing documents to translating and correcting them. Users can also download thousands of documents to build up Veolia Secure GPT's knowledge base so that it becomes

even more powerful and accurate. It includes an innovative function that significantly helps limit the hallucinations and interpretive bias that can be a feature of generative AI. Stuart Stock says that “the language models² we use are configured to generate trustworthy content. If they don't have the answer, they won't make something up.”

1. Generative Pre-trained Transformer: type of language model used to drive chatbots like ChatGPT.
2. LLM or Large Language Model: a learning algorithm that can understand and generate natural language text documents.

AUGMENTED EFFICIENCY

Prioritize, structure, inspire. Save time and gain efficiency. Veolia's generative AI solution is tailor-made to make daily life easier for its users. For tasks as varied as helping understand and summarizing reports that might be several hundred pages long, drafting a call for tenders, and picking the perfect candidate from a list of CVs, Veolia Secure GPT provides a great boost to productivity. The perfect antidote to fear of the blank page, it is also highly useful for project leaders who need to begin putting a roadmap together. Or imagine you have to prepare for a meeting to discuss renewing a contract: based on a query, the tool can summarize past performance and generate an outline proposal in a few seconds. These are just a few of the use cases identified since rollout, and plenty more can be developed: the one million and more prompts generated and stored anonymously since Veolia Secure GPT launched form a knowledge base that will prove invaluable for upgrading future releases of the new assistant. Stuart Stock emphasizes it is an assistant and not a replacement, is quick to allay fears that AI is a threat to jobs. "People tend to think there is something almost magical about generative AI tools. The truth is that their effectiveness relies on human intervention and how queries are put to them. The art lies in knowing how to put a question so that you'll get the best possible answer." This is why users need training to learn about the nuances of prompt engineering and make sure they get the best out of Veolia Secure GPT. The goal is for 80% of all eligible employees to receive training by the end of 2024.

MOVING TO THE NEXT LEVEL

Veolia's position as one of the first companies listed on France's benchmark CAC 40 stock market index to develop its own generative AI tool underlines the robustness of a digital strategy perfectly suited to managing the revolutionary new uses that artificial intelligence promises. "Veolia is getting ready," says Stuart Stock. "We're setting up a project to look at our global governance of AI. It will be used to oversee applications, share best practices and identify pockets of value." As for Veolia Secure GPT, developments are underway to take it to the next level after a convincing start. The most recent update gives authorized users access to the Group's knowledge base. "We're also working on developing custom applications for each of the Group's business units. In time we are hopeful that improved language models will mean we can offer a multi-modal version of our solution that will be able to not only generate text and images but also accept queries that include images or videos, and possibly even trigger actions, just like a virtual assistant." With a constant focus on ensuring that data is used safely at all times. ▶



© CHRISTEL SASSO / CAPA PICTURES / VEOLIA MEDIA LIBRARY

“Thanks to the development of generative AI tools such as ChatGPT, we’re changing the way we work every day. That’s the real game-changer!”

Claude Laruelle



And tomorrow?





Greening tomorrow's world through technological innovations

Faced with the issues of climate change, breakthrough innovations like generative AI, geopolitical tensions, and the decarbonization of the economy, the future looks dizzying and uncertain but also fascinating and full of opportunities. As a company born amid the industrial revolutions that changed the world in the 19th century, Veolia now aims to be the missing link in ecological transformation.



 VEOLIA

And tomorrow?



“The biggest challenge of the 21st century will be to combine human progress and environmental protection.”

Sébastien Daziano

The biggest challenge of the 21st century will be to combine human progress and environmental protection,” says Sébastien Daziano, Veolia’s Senior Executive Vice President, Strategy and Innovation. The reality of climate change is now indisputable. According to the Ecological Transformation Barometer, designed by the Group in partnership with the research and consulting firm Elabe, 89% of citizens worldwide agree, and 61% believe that the costs of the consequences of climate change will be greater than the investments needed for ecological transformation. Faced with this situation, 55% of respondents think that we need to fundamentally change our habits. Firstly, by adopting a more moderate lifestyle. And secondly, by putting in place the technology to mitigate and reduce the consequences of pollution and climate change. In today’s world, taking public opinion and people’s expectations into account is an essential that no company can afford to ignore: in everything from applying for a job² to shopping for groceries³, citizens are increasingly choosing environmentally friendly companies. Veolia is calling for moderation while still aiming to build a future that is both sustainable and desirable. “Moderation is one possible response to bring about a sustainable and desirable world. It makes sense from an economic viewpoint, given that we assign greater value to things that become rare. The concept of planetary limits highlights how, for a long time, we’ve lived without any regard for the physical limits that ensure our planet remains habitable,” says Sébastien Daziano.

Taking planetary limits into account, now more than ever, is Veolia’s priority in a world that is seeking to moderate its impact. Especially given the scale of the climate challenge. The International Energy Agency estimates that in 157 years mankind will have increased its greenhouse gas emissions 145-fold⁴. Furthermore, according to the United Nations, more than two thirds of the world’s population will live in cities in 2050 in an unprecedented reversal of all of human history, during which the vast majority of people have lived in rural areas. And in cities, the consequences of climate change are increasingly visible and will only accelerate: record high temperatures reached thanks to rapid urbanization, urban heat islands, more frequent and more intense

natural disasters, flooding worsened by soil sealing, impacts on fauna and flora, famine, climate migration, and more.

DECARBONIZING, DEPOLLUTING AND REGENERATING RESOURCES

Veolia was born in a world that knew neither electricity nor the automobile. Over its 170-year history, the Group has reinvented itself on multiple occasions and will build on its experience to rise to the challenges of the 21st century. “The Group is a contemporary of the industrial revolutions that have transformed the world on multiple occasions and has brought solutions to new challenges as they arise,” adds Sébastien Daziano. Every four years, Veolia draws up a strategic plan that sets the direction for the Group and all its 218,000 employees. This year, GreenUp marks the launch of a new cycle that aims to accelerate the deployment of practical, affordable, and replicable solutions that depollute, decarbonize, and regenerate our resources.

1. Ecological Transformation Barometer, Veolia and Elabe, 2022.

2. “IBM Survey: employees more likely to accept jobs from sustainable companies,” E. Kerencheva, ESGtoday (18/02/2022).

3. “Consumers care about sustainability and back it up with their wallets,” McKinsey and NielsenIQ (06/02/2023).

4. “Les élèves de l’EIVP et Veolia imaginent la transformation écologique de la ville” (“The students of EIVP and Veolia imagine the ecological transformation of the city”), Ecole des Ingénieurs de la Ville de Paris, (01/02/2024).

And tomorrow?



“The Group is a contemporary of the industrial revolutions that have transformed the world on multiple occasions and has brought solutions to new challenges as they arise.”

Sébastien Daziano



© CHRISTOPHE MAJANI D'INGUMBERT / VEOLIA MEDIA LIBRARY

And tomorrow?

“Every strategic plan is an opportunity to make choices, updated in light of the new challenges that await us and our customers: decarbonizing and adapting to climate change, protecting biodiversity, ensuring access to resources, enabling our customers’ search for reindustrialization and strategic sovereignty, and protecting people’s well-being and health,” says Sébastien Daziano.

The Group is primarily focusing on three key areas: depolluting, decarbonizing, and regenerating resources, themselves supported by growth boosters. “In practical terms, it involves rolling out solutions to make industrial processes more efficient, solutions to reuse or recycle materials, and finally, solutions designed to protect human health and living things more generally,” adds Sébastien Daziano. The transformation strategy is built on developing local energy and bioenergy, water technology and new solutions, and hazardous waste treatment. Veolia’s new strategic plan picks up the pace, making innovation a crucial catalyst within the Group.

INNOVATION FOR THE PLANET

The Group is constantly reinventing itself and adapting to the challenges of the 21st century in three different ways: improving its operational performance through incremental innovation, transforming its existing business areas, and developing new activities. “Improving our operational performance means using digital and AI to analyze and automate decision-making, improving the energy performance of the facilities we operate, which is exactly what we’re doing with Hubgrade⁵.”

“Transforming our activities sometimes means changing how we see our facilities, both for ourselves and our customers: a waste disposal center can become a bioenergy and photovoltaic plant. An incinerator, initially designed solely to process non-recyclable waste, can become an energy recovery plant, helping areas achieve strategic autonomy in low-carbon energy.” In the future, these facilities could help add value to biogenic carbon to create new sustainable fuels. Another example is decarbonizing urban heating networks: “In terms of new business activities, one key example is recycling electric vehicle batteries,” adds Sébastien Daziano. Always seeking new ideas, Veolia contributes to multiple innovation ecosystems worldwide in partnership with incubators such as Imagine H2O in the United States and Asia. Veolia will also continue its investments, allocating an additional €200 million to industrial pilot projects and acquiring new technologies in addition to its more than 4,800 existing patents. Veolia’s business activities are built on innovation, and that includes AI, which is disrupting our daily lives.

THE ROLE OF AI

Artificial intelligence will transform our industries, and Veolia is no exception. AI is opening up major opportunities for the Group by helping decarbonize its activities, including managing physical flows (water, energy, and waste) and digital data. For example, it helps make operational savings by analyzing the data available within a facility

to optimize the parameters intrinsic to each activity. As a result, we can carry out predictive maintenance of water networks to anticipate faults before they occur, locate pollution sources by analyzing residues in the water, and identify sorting errors in residents’ waste at the point of collection. All this is possible by integrating AI into Veolia’s existing processes.

AI will help us move forward faster and make it easier to exchange information by “augmenting” employees, as Sébastien Daziano explains. “It will play a major role and will enhance and simplify human interactions. Veolia’s strength comes in part from its highly complementary business activities, from our ability to combine them to offer solutions to overcome our customers’ challenges. To do this, we need to interact with a wide variety of stakeholders: for example, when a local authority can power its heating network with waste heat from an industrial customer, we work with both parties. AI will facilitate information flows and decisions, benefiting decision-makers, who will continue to interact with teams of flesh-and-blood Veolia Resourcers.” A reminder of our collective strength and the human expertise within the Group, which AI will only strengthen.

HELPING DEVELOP TOMORROW’S TALENT

With the launch of GreenUp, Veolia’s new strategic program for 2024–2027, the Group is rolling out existing solutions and developing tomorrow’s technology at an accelerated pace, with humans playing an essential role. A report published by the Grande École du Numérique highlights the clear lack of skills and training on France’s digital market.

While businesses have always needed to attract young people, Gen Z and Y have values that make them crucial allies in creating a more sustainable economy. Not only are they highly aware of ecological issues, but they are also willing to act to remain loyal to their beliefs. According to a survey by Toluna and Harris Interactive⁶, 80% of people aged 18–30 are concerned about natural resource depletion, while 70% would avoid applying for a role and 57% would leave their job if they believed that the company did not take environmental challenges seriously enough.

Young people are also very comfortable with digital technology. Three quarters of Gen Z and 65% of millennials are confident in their digital skills⁷, compared to 56% of Gen X. Young people are also familiar with finance thanks to their interest in the topic and apps that make investment accessible, and their investments are heavily skewed toward green growth. 90%⁸ of millennials are interested in sustainable investment, according to Morgan Stanley, while a third of them and 19% of Gen Z often or exclusively buy financial products that take ESG criteria into account: as a comparison, this figure falls to just 2% among baby boomers. In addition, 40%⁹ of Gen Z report choosing to focus their investments on companies with a purpose. With Gen Z’s income expected to rise in the future (by 140%¹⁰ in the next five years, according to some estimates), sustainable development has a bright future ahead of it. By 2025, one third of financial assets will have ESG

mandates. The International Institute for Sustainable Development, a Canadian think tank, estimates that total investment in these assets will reach \$160 trillion by 2036, compared to \$30 trillion in 2018¹¹. Young people's expectations regarding their working lives and environments differ greatly from those of their elders. Veolia's ambition, both today and for the future, is built on welcoming the younger generations, training them, and making them feel fulfilled by giving them the tools to green their future through understanding and action.

But what will Veolia be tomorrow? How can we make the world greener? At the crossroads between climate denial and calls for an ecological pause, Estelle Brachlianoff offers a third way: an ecology that transforms, decarbonizes, depollutes, and regenerates resources. ▶

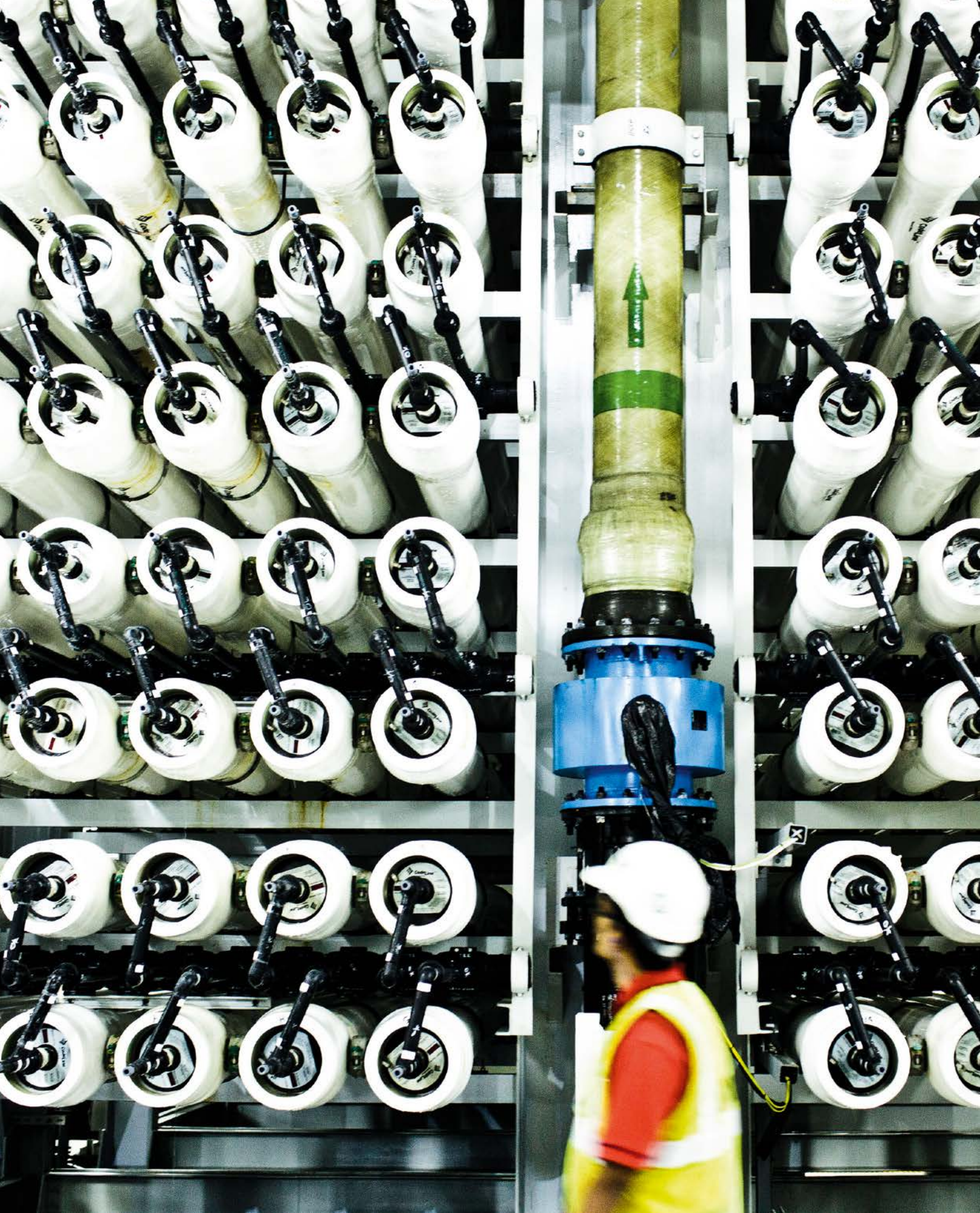
“Veolia’s strength comes in part from its highly complementary business activities and its ability to combine them to offer solutions to overcome our customers’ challenges.”

Sébastien Daziano

Discover GreenUp:



5. “Hubgrade: digital solutions that accelerate ecological transformation for cities and industries,” *Smart city*, Veolia.com.
6. “Les jeunes et la prise en compte des enjeux écologiques dans les études et le monde du travail” (“Youth and the consideration of ecological challenges in studies and the world of work”) Toluna Harris Interactive report for “Pour un réveil écologique,” July 2023.
7. “The rise of Generation Startup: say hello to Gen Z,” *Startups Magazine*, June 2023.
8. “Sustainable Signals, New Data from the Individual Investor,” *Morgan Stanley Institute for Sustainable Investing*, 2017.
9. “How Millennials and Gen Z Are Driving Growth Behind ESG,” *C. Versace and M. Absy*, *Nasdaq News* (23/09/2022)
10. *Ibid.*
11. *Ibid.*





And tomorrow?



Interview with Stuart Stock

Head of Digital Business & Technologies at Veolia

Generative AI in business: evolution or revolution?

It's a revolution! Gen AI has the potential to significantly transform our way of working. It can generate realistic and coherent outputs from structured and unstructured data by leveraging learning techniques and massive data sets. It has the ability to automate and optimize various processes in terms of traditional business models, leading to increased efficiency and cost savings. Furthermore, Gen AI has the potential to radically revolutionize certain industries. I'm thinking in particular of healthcare, where it can help develop treatments faster and more efficiently by simulating chemical structures and predicting their success rate.

What ambition does your roadmap contain as part of the new strategic program?

Through AI and its ability to augment and automate human decision-making, our ambition is to support the transformation of our employees, customers, and services, which will drive a significant increase in value creation by 2027. That's why our roadmap is divided into four main elements: creating a platform of Gen AI services that are available to local teams; building a world-class data platform to support our AI ambitions for all BUs to implement; building the technical foundations for our BUs to become AI-enabled; and infusing our digital Hubgrade products with AI and generative AI to drive an increase in value creation from our own and our customers' assets and operations.

Gen AI poses a major ethical challenge for companies. How are you tackling it?

We take it very seriously. This new technological paradigm undoubtedly influences social and environmental dynamics, which is why we are following an ambitious and innovative set of guidelines. The fact that Gen AI is rapidly transforming the industrial landscape necessarily brings about structural changes that are likely to affect jobs and skills, as well as the ecological

footprint. But it will also create job opportunities and unprecedented challenges. Some of the key actions we will put in place include: regularly assessing AI's social and environmental impacts, stimulating employee training around Gen AI, and ensuring strict compliance with our *raison d'être* by aligning Gen AIs with human rights and inclusion objectives. We will ensure we accelerate toward sustainable orientations on the use of AI models using technological platforms powered by renewable energy. Veolia aspires to spearhead the building of a trustworthy Gen AI, fully aligned with our societal and ecological challenges.

How do you intend to get the new generations on board for the ecological transformation?

Through our purpose, i.e., ecological transformation. The meaning and usefulness that it provides for everyone are both fundamental for the younger generations who are aware that the legacy they are receiving is a huge challenge for the future. With its unique purpose as its guiding star, its exceptional global network of environmental expertise, and its modern, agile digital function that is highly integrated with its business activities, Veolia is at exactly the crossroads it needs to be at today. This is why we need to be even more ambitious and more visible to these younger generations. We must not hesitate to challenge them and be present on social networks and in schools to involve them in solving the major environmental challenges that are so crucial to Veolia's business and value. ▶

Veolia Cares

focusing on employee well-being

Deployed in September 2023, Veolia Cares guarantees a common core of employee benefits for the Group's 218,000 employees, even in countries where nothing is required by law. Unprecedented in its scope, the program is a powerful statement that reinforces the social dimension of the Group's multi-faceted approach to performance.

Levels of social protection differ greatly from country to country, an issue that Estelle Brachlianoff began tackling when she was appointed CEO in July 2022. She is convinced that collective strength, solidarity, and inclusiveness are key to tackling the challenges of ecological transformation.

Veolia Cares is the result of this conviction. The program covers over 95 countries, each with its own unique situation. Launching this program required extensive educational and organizational efforts. "After determining the social protection standards to be put in place (see inset), we helped local units analyze discrepancies with existing measures, which were sometimes very complex," explains Anne-Sophie Lascombes, Director of Employee Benefits in Veolia's Human Resources Division. The global scope of the program added further challenges: "With a presence in 80 countries, we wanted to provide a protective environment for our 218,000 employees. People tend to think that social protection is a local matter, but in a large group such as ours, we're able to offer common standards," says Isabelle Calvez, Veolia's Senior Executive Vice President, Human Resources.

Working hand in hand with business units and officials in various countries was crucial in rolling out Veolia Cares. "Thanks to these close-working relationships, we were able to incorporate major improvements to employee benefits into our program, and these have been received very positively in the field, particularly our inclusive approach to parental leave," explains Jean-Yves Jouan-Auzeby, Director of the Employee Benefits & Savings Division.

In areas where initial resistance to change did arise, the CEO's commitment helped overcome obstacles and inspired a sense of purpose. "When we spoke to people, we noticed a tipping point when they stopped asking 'Why are we doing it?' and started enquiring 'How can we do it?'," says Hervé Lavis, Veolia's Group Compensation & Benefits Director. Veolia Cares has already been incorporated into the HR section of the Group's Essentials, the fundamental values that define Veolia's main non-negotiables.

"Taking care of our employees is our priority. Veolia has always done everything in its power to ensure safety at work. With Veolia Cares, we're strengthening social protection for all our colleagues and their families. We're proud to offer them the best possible conditions to make sure they have peace of mind at work and at home."

Isabelle Calvez
Senior Executive Vice President,
Human Resources, Veolia

5 guarantees

to guide, help and support
all employees in the important
stages of their lives



Parental leave

100% base salary paid:

- 10 weeks for the primary parent*
- 1 week for the secondary parent*

**Applies when a child is born or adopted*



Health cover

Guaranteed access to medical care via statutory health insurance or a company scheme



Guaranteed death benefit

of at least 6 months' salary, whatever the cause of death



All employees with caregiving responsibilities

benefit from flexible working conditions



Volunteering / An annual paid day off

to support a charity or environmental protection organization

**These rights apply everywhere,
for everyone. No matter your location,
nationality, or status.**



TERRA ACADEMIA, THE FIRST SCHOOL DEDICATED TO ACCELERATING ECOLOGICAL TRANSFORMATION

On March 18, Terra Academia, a school and gas pedal of ecological transformation, inaugurated its first campus in the northern French town of Arras in the presence of its Chairman Jean-Michel Blanquer, Antoine Frérot and Estelle Brachlianoff, Chairman and CEO of Veolia, and Frédéric Leturque, Mayor of Arras. Terra Academia is an initiative of Veolia, the founding company, and aims to accelerate the development of training for professions linked to ecological transformation.

Between now and 2030, the ecological transformation is predicted to impact approximately 8 million jobs and potentially create 150,000 jobs in France, according to the Secretary-General in charge of environmental planning. As a result, Terra Academia, a school and accelerator of ecological transformation founded by Veolia, unveiled a great ambition this past March 18: make education on regions' specific needs concerning ecological transformation more attractive and accessible. By bringing together actors from the economic, academic, public and non-profit sectors, Terra Academia intends to train 60,000 people and offer work experience to 100,000 young people by 2030 in career discovery

programs by 2030. "Ecological transformation is a non-negotiable priority for humanity. It will not happen properly unless training, the absolute foundation for success, is not used to accelerate the process. We must take action, collectively as well as individually, to protect our planet and plan for human, economic and social progress in light of this imperative," explains Jean-Michel Blanquer, Chairman of Terra Academia.

Terra Academia will work with young people, people in employment, people in retraining, local government managers, and local politicians. The school's vocation is to adapt, enhance and create the necessary trainings by working with local academic providers, but also to bring to life a coalition of individuals committed to ecological transformation. Backed by an Institute of Higher Studies in Ecological Transformation and a multidisciplinary scientific council, Terra Academia will open its first courses, aimed at executives, in June 2024.

A skills catalyst to accelerate transition

Backed by a coalition of committed players, including the founding company Veolia, Terra Academia has already brought together a number of local partners, including EDF Hauts-de-France, the University of Artois and the FACE association, as well as national partners such as Dassault Systèmes and the Institut Mines Telecom. Tomorrow, this coalition is set to expand, as Estelle Brachlianoff, Veolia's Chief Executive Officer, hopes it will: "I firmly believe that education in ecological issues is essential for everyone, and this requires appropriate and accessible training, close to home and aimed at everyone. That's why I'm calling on other companies who share this ambition to join our coalition." ▶

GreenUp: strategic program for 2024-2027

Named “GreenUp”, Veolia’s new strategic program for 2024-2027 should ensure the Group is recognized by all stakeholders as the missing link in ecological transformation. The Group is forging a sustainable future by accelerating its worldwide rollout of existing solutions while encouraging innovation to create the solutions of tomorrow.

“GreenUp embodies Veolia’s commitment to accelerating the green revolution. It isn’t just about advocating for a greener world but about actively greening the essential aspects of our lives,” explains Estelle Brachlianoff. “This transformation is about decarbonizing, depolluting, and regenerating natural resources, moving from a worrying ‘before’ to a reassuring ‘after.’”



The Group’s global presence positions it as a key figure for its customers, regulators, the public, and its partners. Veolia’s agility in times of crisis underscores its ability to tackle global ecological challenges head-on. GreenUp also deals with the high cost of inaction, which now exceeds the cost of action, by protecting public health, quality of life, and purchasing power. Veolia’s essential solutions make the Group a key player in ecological transformation.

The Group’s strategic acceleration plan is three growth boosters : bioenergy, flexibility and energy efficiency, water technologies and new solutions, and hazardous waste treatment. These high value-added solutions not only emphasize Veolia’s shift in focus to developing new technologies but also serve as key differentiators in the Group’s main markets of municipal water, urban heating and cooling networks, and solid waste. GreenUp includes specific ecological targets, aiming to make Veolia the champion of decarbonization, depollution, and natural resource regeneration.

Innovation is the cornerstone of GreenUp’s success and it plays a key role in the program, with €200 million of additional investment in industrial pilots and new technology. Thanks to its network of eight innovation centers

throughout the world, Veolia is accelerating its efforts to tackle new pollutants as well as capture carbon and recycle strategic metals. Veolia also plans to increase efficiency savings from digital technology and the use of AI.

A pioneer in its dialogue with stakeholders, Veolia is accelerating its partnerships, including “+1, the ecology turned into actions,” a cooperative project launched by the Group involving 50 stakeholders in tasks such as developing Veolia’s new strategic program. The Group is also calling for more co-financing of projects while recognizing the core role of public opinion, in particular in the adoption of new practices such as reusing treated wastewater. Finally, Veolia’s strategic program is supported by a collective of 218,000 employees, with a record engagement rate of 89% bolstered by initiatives such as Veolia Cares and Séquoia 2023, an unprecedented employee shareholder scheme.

As Veolia moves forward, GreenUp is not simply a strategy but a global commitment to successful ecological transformation. Estelle Brachlianoff says: “Ecological awareness must now be channeled toward effective action, protecting rather than punishing, and reconciling both the economy with ecology and human health with the environment.”



#Key figures

€4 bn
of growth investments
with €2 bn priority investment in 3 strategic activities, our growth boosters

70%
of turnover will be generated by these growth boosters
compared to 30% today


x2 doubling our investment
in industrial pilots and new technological acquisitions, reaching a total of €200 million

Decarbonization:
18 M
metric tons of CO₂ eliminated by 2027
2027 (scope 4) & emissions reduction pathway compatible with 1.5°C of warming (scopes 1&2)

Regeneration:
1.5 bn cubic meters of fresh water saved by 2027

Depollution:
10 M metric tons of hazardous waste and pollutants treated by 2027

FOR 170 YEARS, WE HAVE PROUDLY CARRIED THE BANNER OF PROGRESS



Veolia was born 170 years ago.
By bringing water to the heart of cities,
we helped eradicate cholera, extend life expectancy,
and free up time for women.
By treating waste,
producing energy,
and introducing paid vacations,
we contributed to human progress.
Today, we guarantee the same essential rights
to our teams worldwide, and we are prepared
to tackle the greatest challenge of our time:
ecological transformation.

Join us to meet tomorrow's challenges.

www.veolia.com/en/careers



The visuals were created through the collaboration of human creativity and artificial intelligence.