

# ON-SITE SERVICES TO INDUSTRIAL CLIENTS



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INTRODUCTION

# 01

HUMANITY HAS NEVER  
FACED AS **MANY**  
**CHALLENGES**  
AS IT DOES IN THE  
**21<sup>ST</sup> CENTURY**

*We live on a planet we have not cared for properly.*

**A**nd now we are paying the price. While the extreme weather events battering every continent are the most visible scars, other equally fearsome challenges need tackling during the coming two decades. With the clock now running on the climate emergency, industrial site services have a role to play in terms of improving the energy efficiency of their operations and reducing their reliance on fossil fuels, or by adopting environmentally responsible practices for managing on-site health risks and the waste produced.

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In strictly practical terms, in 20 years' time there will be nine billion people on earth, all of them needing homes and food, and producing waste that will need processing; the rise of the global middle class and digital technologies will increase energy demand by 30%; rampant urban spread will swallow farmlands that are already heavily degraded; proximity between untamed natural environments and urban spaces will increase the risk of new viruses being transmitted to humans; rising temperatures will make life ever harder in megacities, where population densities will continue to increase; resource scarcity, particularly freshwater, the new "blue gold", will

***In 20 years' time there will be nine billion people on earth.***

cause major conflicts between users, destabilizing entire regions across the planet, and so on. These are just a few of the planetary challenges that Veolia seeks to help resolve.

Tackling these challenges is critical: they have shown us that our lifestyles are under threat and that we need to change them right now because humanity cannot go on living in the same way. There is no turning back. Our world is different now, and we must adapt. Unless we act immediately, circumstances that seem exceptional today will become the norm tomorrow. We have to take stock and act collectively.

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***The rise of the global middle-class and digital technologies will increase energy demand by 30%.***

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# 01 — Introduction

## BECAUSE ALTERNATIVE SOLUTIONS EXIST

*Veolia's resolute commitment to ecological transformation means that it can respond to the highly complex challenges shaping tomorrow's world.*

**V**eolia has adapted its business activities so it can better support its stakeholders in their own transformations. Veolia believes in joining forces, because nobody can tackle all these challenges alone, while also preserving natural resources and combating the climate emergency.

In these unsettled times, Veolia provides all industrial companies — whether operating in energy and chemicals, agri-foods, pharmaceuticals and cosmetics, vehicle manufacturing or mining — with a set of services designed to help them achieve ecological transformation at their production sites.

The following pages show how the On-Site Services to Industrial Clients business line actively contributes to the vital ecological transition needed to build a more sustainable world, and how it leverages innovations to roll out new solutions for tomorrow.



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***Treating and recycling industrial process water, producing and supplying decarbonized renewable energies, recovering waste and maintaining equipment, Veolia provides industrial and manufacturing companies with on-site services that deliver high added value.***

*Our solutions, rooted in Veolia's long track record of expertise in water, energy and waste management, demonstrate more than just their environmental and social worth; they also deliver clear economic benefits to our customers. They allow us to support businesses as they undertake their own ecological transformations.*

”

**PHILIPPE BUCHERT**

Director, On-Site Services  
to Industrial Clients

VEOLIA SERVING THE PLANET

02

# PRESERVING WATER RESOURCES BY IMPROVING MANAGEMENT OF THEIR USE

*Water is vital to life, but the availability and quality of this critical resource is increasingly under threat in today's world thanks to factors such as growing demand, pollution and scarcity.*

**I**n many industries, water is an essential resource for the production cycle. For example, it is used directly in the manufacture of many cosmetics and food products, and ensures that cooling systems operate correctly at refineries, chemical plants, metallurgical sites and power stations. Yet these systems do not always operate optimally in terms of how they use water. Veolia provides its industrial customers with solutions for meeting the challenges involved in supplying water and optimizing its use, disposal, treatment and possible reuse.

## At Tianjin, in China

Veolia was selected in 2007 by one of the country's largest chemical companies, Tianjin Soda, to design, finance, build and operate all water-related installations at its Tianjin plant. The site's three cooling circuits use over 150,000 cubic meters of water every hour. Veolia manages, secures and optimizes their operation. In parts of the world subject to severe water stress, water reuse is maximized to limit the impacts on available water resources as much as possible.



## In Oman, in the Middle East

Veolia works with BP to mitigate water scarcity at its Khazzan gas field.

Veolia has constructed a desalinated water treatment plant that it now operates and maintains. Of the 6,000 cubic meters of treated water the installation can produce each day, 4,000 cubic meters are used as process water by the gas processing plant. Veolia has also made a major impact on local employment, with Omani staff making up 80% of its site team.

## HELPING INDUSTRIAL CUSTOMERS TO MANAGE THEIR WASTE AND WASTEWATER RESPONSIBLY

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**I**ndustrial companies are required to comply with increasingly stringent waste management regulations. For example, in France the law known as Grenelle II, in force since January 2021, requires all major producers of biowaste to sort, collect and recover it in specific ways. More generally, industrial companies face the challenge of managing and treating their wastewater and waste and the organic by-products generated by their operations.

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### At Obuasi, in Ghana

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In 2019, AngloGold Ashanti Ghana Limited, a subsidiary of South Africa's AngloGold Ashanti, the world's third largest gold producer, signed a three-year contract with Veolia for the operation and maintenance of all water treatment plants at its Obuasi mine in Ghana. Under this contract, Veolia is responsible for four wastewater treatment plants and two drinking water production plants.

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Regulatory compliance is essential to industrial companies. Greenwashing is no longer enough because these days they actually have to meet their regulatory obligations. But compliance often requires specific skill sets that industrial companies may not find among their staff.

Veolia provides the expertise and solutions needed to recover waste and process and recycle wastewater from production sites. These technologies also help to optimize production processes: by reducing waste volumes and recycling water, sites improve their environmental footprints.

## In Lagos de Moreno, Mexico

Veolia partnered with Nestlé, as part of project Cero Agua, to develop a solution for recovering water from cow milk. The water is then used on-site in the production of powdered infant formula. An identical system is also used at Nestlé's Mossel Bay site in South Africa.



# At Qingdao, in China

In another application for Nestlé centering on producing powdered milk and dairy products, Veolia designed and built a zero water abstraction and zero water use plant to reduce risks of conflicts surrounding water use.



## PROMOTING THE USE OF RENEWABLE DECARBONIZED ENERGY RESOURCES

**A**s energy resources become increasingly rare, and faced with the pressing need to reduce the amount of carbon dioxide emitted into the atmosphere, Veolia helps industrial companies to improve the environmental footprint of their energy use. Veolia develops solutions that promote the use of renewable energy sources that are less carbon intensive or fully decarbonized.



### At Barranquilla, in Colombia

Veolia works with bottling company Coca-Cola FEMSA to support its drive to improve energy efficiency at its Barranquilla plant. As part of this process, Veolia has developed an on-site trigeneration unit which it operates and maintains.

# At Davidstow, in the United Kingdom

In south-west England, Veolia was contracted by Dairy Crest, the UK's largest dairy company, to design and build a steam boiler able to generate sufficient steam needed for the 55,000 metric tons of cheese produced at the site every year. The steam plant is fired using wood pellets sourced from business waste and private individuals. Once collected and sorted by grade, the wood is shredded, cleaned of all contaminants and then processed into pellets. Veolia's solution uses highly efficient and competitive technologies, with a Byworth chain grate-type stoker boiler, a technology generally used for coal, coupled to a gas turbine to optimize carbon emission reductions and an advanced combustion system. The installation delivers environmental, economic and social benefits.

28%

reduction in carbon emissions

Waste

RECOVERY

42%

reduction in energy costs

CREATION  
of local jobs



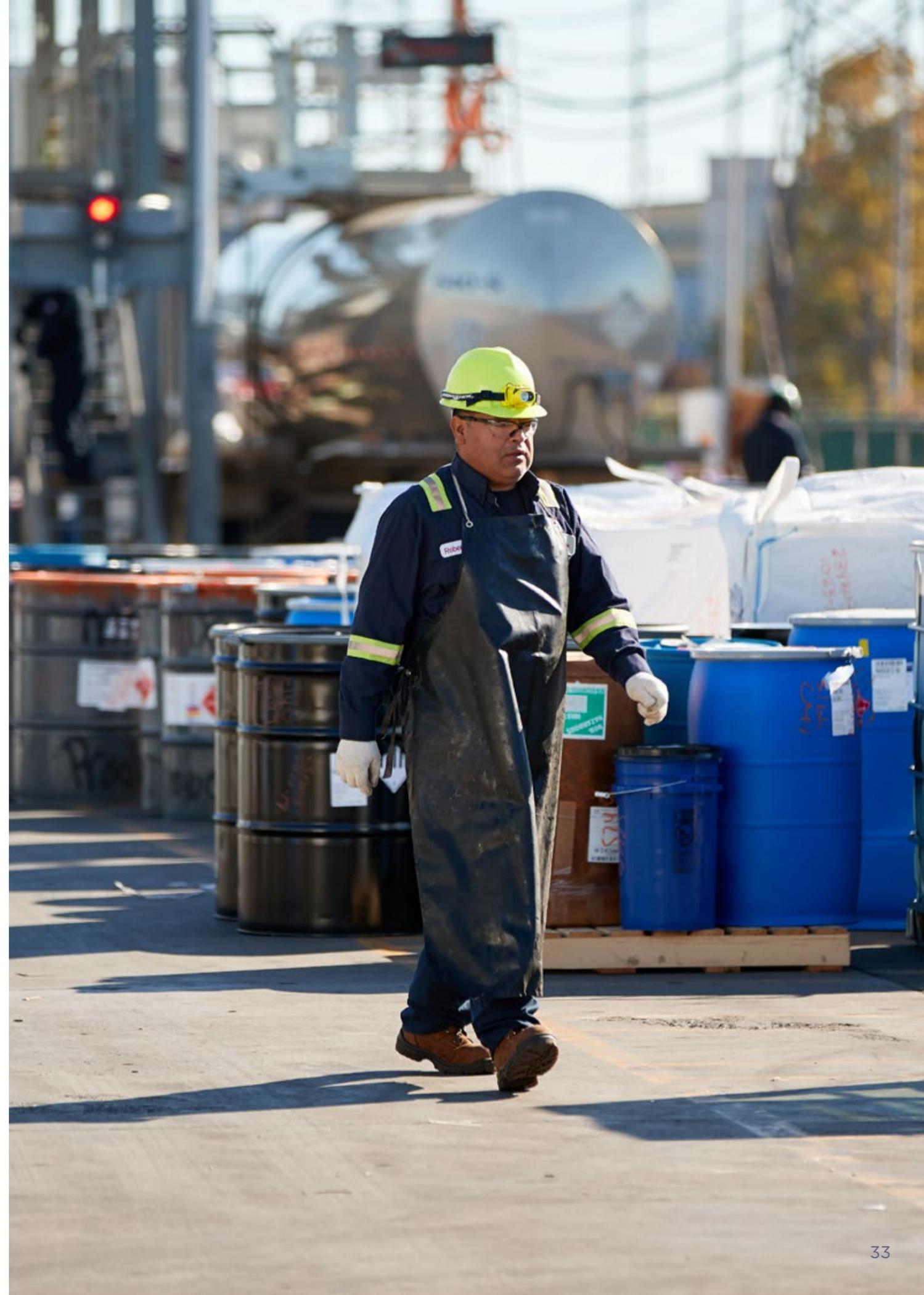
VEOLIA SERVING BUSINESSES

03

## MANAGING WASTE GENERATED AT INDUSTRIAL SITES

*Industrial companies are required to take responsibility for what happens to the waste produced at their operational sites.*

**I**n some cases, hazardous and environmentally harmful waste must be treated under stringent safety conditions and in compliance with local environmental regulations. The challenge lies in understanding how to manage this type of waste in the most cost-effective manner, but without negatively impacting the capacity of companies to focus on their core activities.



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Veolia has the proven experience, expertise and technologies to efficiently and profitably process all types of waste streams produced at industrial sites. Veolia provides secure waste disposal and recovery that also reduces its customers' costs and environmental footprints. It can offer complete systems for managing all types of waste generated at a site. These total waste management services include waste collection and sorting, recycling or local energy recovery and transport to other specialist processing sites.

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## In France

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To meet the strategic challenges surrounding access to the raw materials needed to produce vehicle batteries (cobalt, nickel and lithium), Veolia has created a local circular economy consortium with Solvay and Renault, the vehicle manufacturer. The partnership makes it possible to give a second life to used lithium-ion batteries and optimize their recycling, from collection to dismantling, extraction and the purification of the metals they contain. These metals are then transformed into new materials ready to be returned to the battery manufacturing process.



# In the USA

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Veolia provides GE Renewable Energy with solutions for recycling wind turbines. End-of-life turbine blades are processed into a raw material used in the manufacture of cement. This cuts the amount of coal, sand and minerals needed to make cement, thus promoting the circular economy.



## 03 — Veolia serving businesses

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When it comes to treating biowaste, Veolia offers its customers a simple and efficient specialist solution for managing the biowaste they produce. This covers all aspects of waste management, from collection to sorting, separation and recovery via dedicated channels.

## In Malaysia and in France

Veolia developed insect-based bioconversion in 2016 with two startups, Entofood and Mutatec: a solution that will transform organic by-products from food industry and agriculture refuse (either liquid or solid form) into proteins for animals feed via the production of insects. As a major industrial player, Veolia successfully set up its first full-scale bioconversion site in 2019 in Malaysia, and is currently building a second facility in France. Its international presence means Veolia can replicate and adapt its expertise in this field in different parts of the world.



## In France

Veolia works to recover aluminum coffee capsules with the founding partners of ARCA - Nespresso France, Nestlé France and Jacobs Douwe Egberts France. All the collected capsules are deconstructed by Veolia at its multi-material recovery site in Boves in northern France before being recycled into new objects and compost for local farmers.



## CLEANING AND MAINTENANCE SERVICES **TO REDUCE THE RISK** OF INTERRUPTIONS TO ACTIVITIES AT INDUSTRIAL SITES

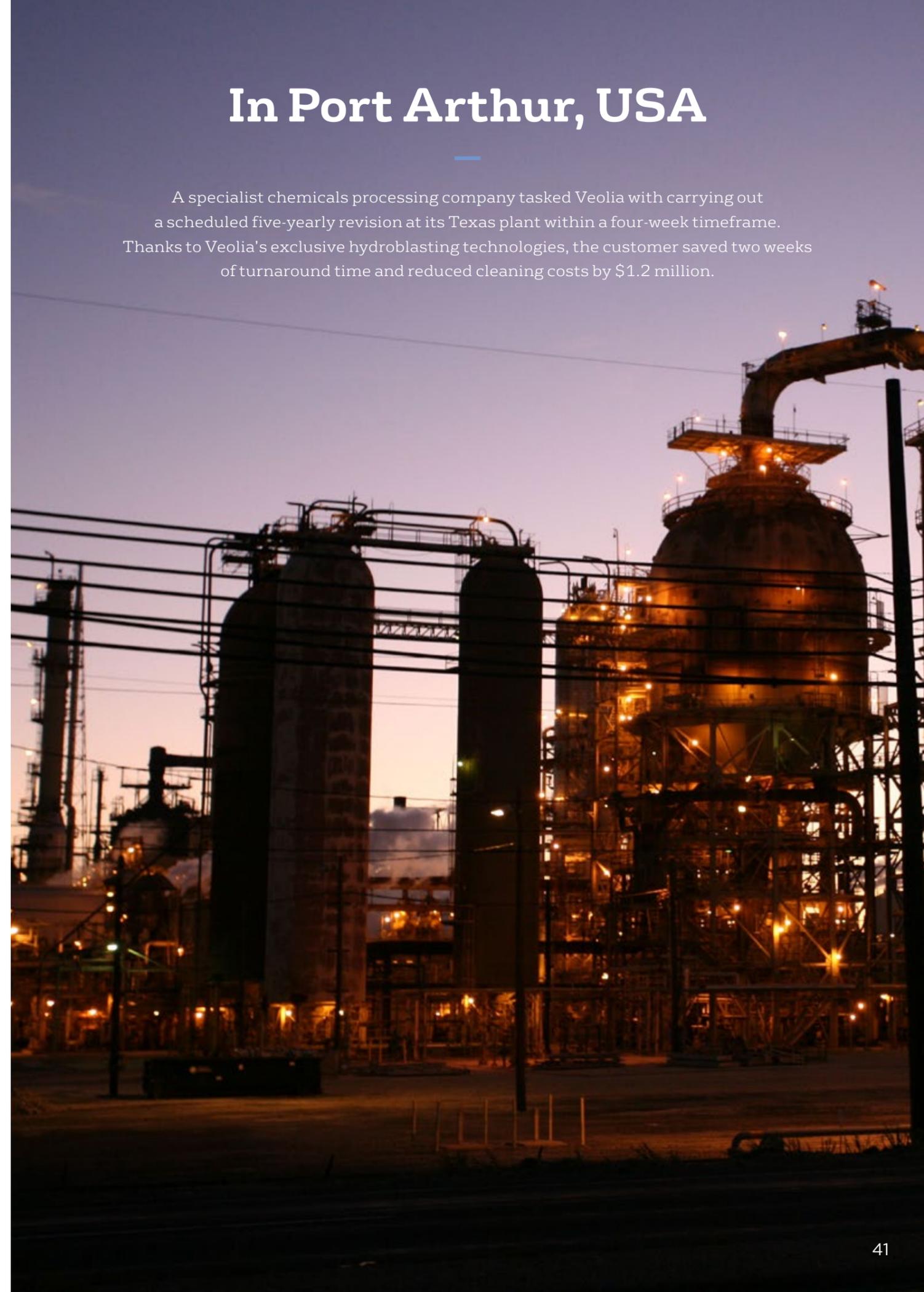
*Limiting production stoppages as much as possible is a critical concern to manufacturers.*

**A**ny technical incident or prolonged period when machinery is out of action for repair can have a real impact on a site's operational results. Maintenance of production assets is one of the solutions for cutting the risk of unplanned stoppages.

The need for maintenance to avoid production stoppages is particularly pressing in heavy industry, where residue and sediment (dust, grease, sludge, etc.) from production processes can cause irreversible damage to production machinery. Veolia has supplied comprehensive and turnkey industrial maintenance and cleaning services to industrial companies for over 30 years.

## In Port Arthur, USA

A specialist chemicals processing company tasked Veolia with carrying out a scheduled five-yearly revision at its Texas plant within a four-week timeframe. Thanks to Veolia's exclusive hydroblasting technologies, the customer saved two weeks of turnaround time and reduced cleaning costs by \$1.2 million.



## GUARANTEEING PUBLIC HEALTH AT INDUSTRIAL SITES

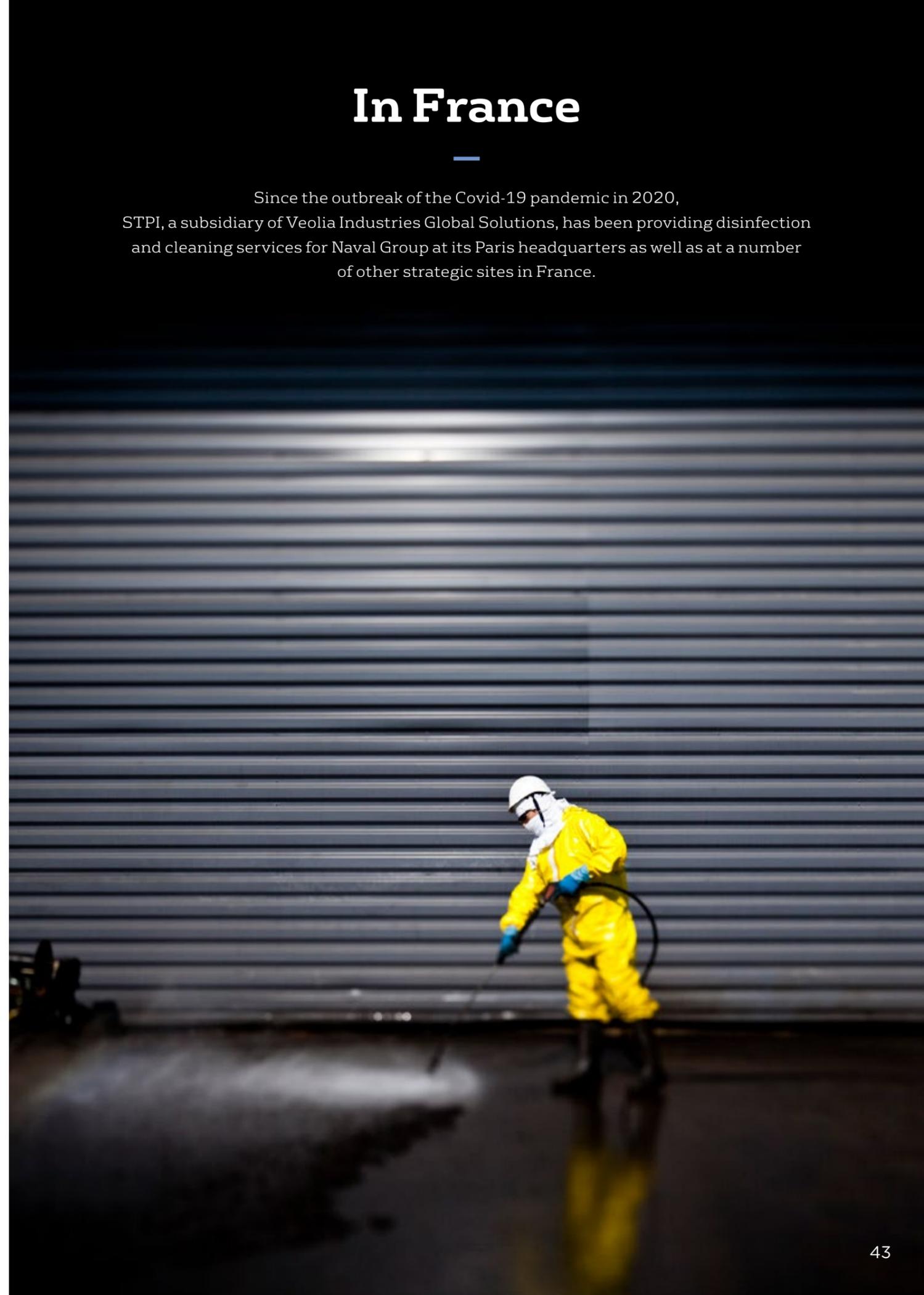
*Industrial companies are under an obligation to ensure public health at their sites and to protect the health of the people working there.*

**T**his requirement entails applying a range of measures, including actions to combat the sort of bacteriological risks illustrated by the Covid-19 pandemic.

Veolia provides on-site health and environmental services to meet these needs. It offers a range of different services according to the specific features of the site concerned, including disinfection using nebulization or spraying, cleaning services for office and industrial buildings, disinfection of outdoor spaces, actions to ensure the correct operation of air-handling systems used to regulate ventilation and air quality in buildings, and disinfection of hot and cold water networks.

## In France

Since the outbreak of the Covid-19 pandemic in 2020, STPI, a subsidiary of Veolia Industries Global Solutions, has been providing disinfection and cleaning services for Naval Group at its Paris headquarters as well as at a number of other strategic sites in France.



INVENTING TOMORROW: CENTRAL  
TO EVERY VEOLIA INNOVATION

04

## AUTOMATED CLEANING TECHNOLOGIES

**V**eolia innovates as part of its response to industrial companies' needs for equipment cleaning services, rolling out remote automated solutions that make cleaning operations faster and safer while also improving working conditions for employees. These technologies include hydroblasting with very high-pressure water, robot-aided cleaning and chemical cleaning. Chemical cleaning uses chemical processes to dissolve, decompose or modify deposits, scale and sludge. This can speed up cleaning times by as much as 90% and provides better quality cleaning in comparison to mechanical methods, as well as reducing the amount of water needed.



## MATERIAL RECOVERY AND PLASTICS RECYCLING

*The fight against plastic pollution is one of the great environmental challenges of our time.*

**T**his involves cutting the amount of plastic used and recycling materials that have already been used. Today just 9% of plastics are recycled, despite the fact that global production continues to rise and is forecast to triple by 2050. The consequences for the environment, human health and biodiversity are widely known and documented.

The expertise in plastics recycling Veolia has developed means it can now process several types of resins, including polyethylene (PE) used in packaging, construction, etc., and polypropylene (PP) used in the car industry, for subsequent reuse by its industrial clients.



## Partnership with Reckitt

Reckitt (formerly Reckitt Benckiser), the leading manufacturer of health, hygiene and cleaning products, signed a partnership with Veolia in 2019. The goal: for 100% of the company's packaging to be made of recyclable plastics, including at least 25% recycled materials, by 2025. The first product to feel the benefits of the partnership was the packaging for Finish Quantum dishwasher tablets, which now contains 30% recycled plastic. Reckitt opted for a grey color for the new packaging, to avoid using environmentally harmful pigments and additives.

IMPACTFUL SOLUTION

**REUSING TREATED WASTEWATER,**  
AN ALTERNATIVE RESPONSE  
TO WATER STRESS

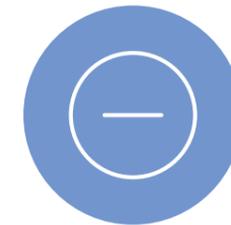
05

# BACKGROUND

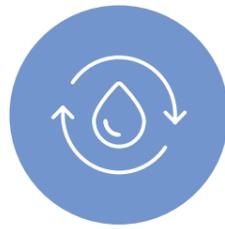
**A**mong the main consequences of the climate emergency, droughts and water shortages are a threat to water supplies. Every year, France sees limits on freshwater use imposed in many areas (87 restrictions in 2019). And if these periods of water stress concern everybody, the impacts are felt far more keenly by farmers and industrial businesses, leading to conflicts surrounding water use and increases in the cost of water. Some factories even have their consumption limited once they exceed 100,000 cubic meters annually. This in turn can put the long-term viability of their activity at risk. In drier parts of the world, access to freshwater and sanitation remains one of the largest challenges that people face. And this is exacerbated by the fact that the planet's growing population tends to move to coastal cities. This phenomenon contributes to increasing the pressure on freshwater resources against a background of major water stress. One of Veolia's responses to this situation is to reuse treated wastewater.



**87 RESTRICTIONS**  
in 2019, limiting  
freshwater use in France



**100,000 CUBIC METERS**  
limitation of water consumption  
in some factories in France



## ADVANCED TECHNOLOGIES REQUIRED FOR REUSING WASTEWATER:

filtration, oxidation,  
adsorption and disinfection

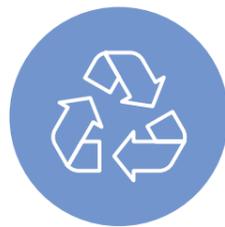
—



2,737

wastewater treatment plants

—



## 347 MILLION CUBIC METERS

of water reused from collected  
and treated wastewater

# SOLUTION

**W**ater is far too precious not to be used several times. This is the circular economy principle behind the idea of reuse: treating wastewater so that it can have a second life before being discharged into the natural environment. This water can be reused without risk, and helps to limit the amount of freshwater taken from the environment.

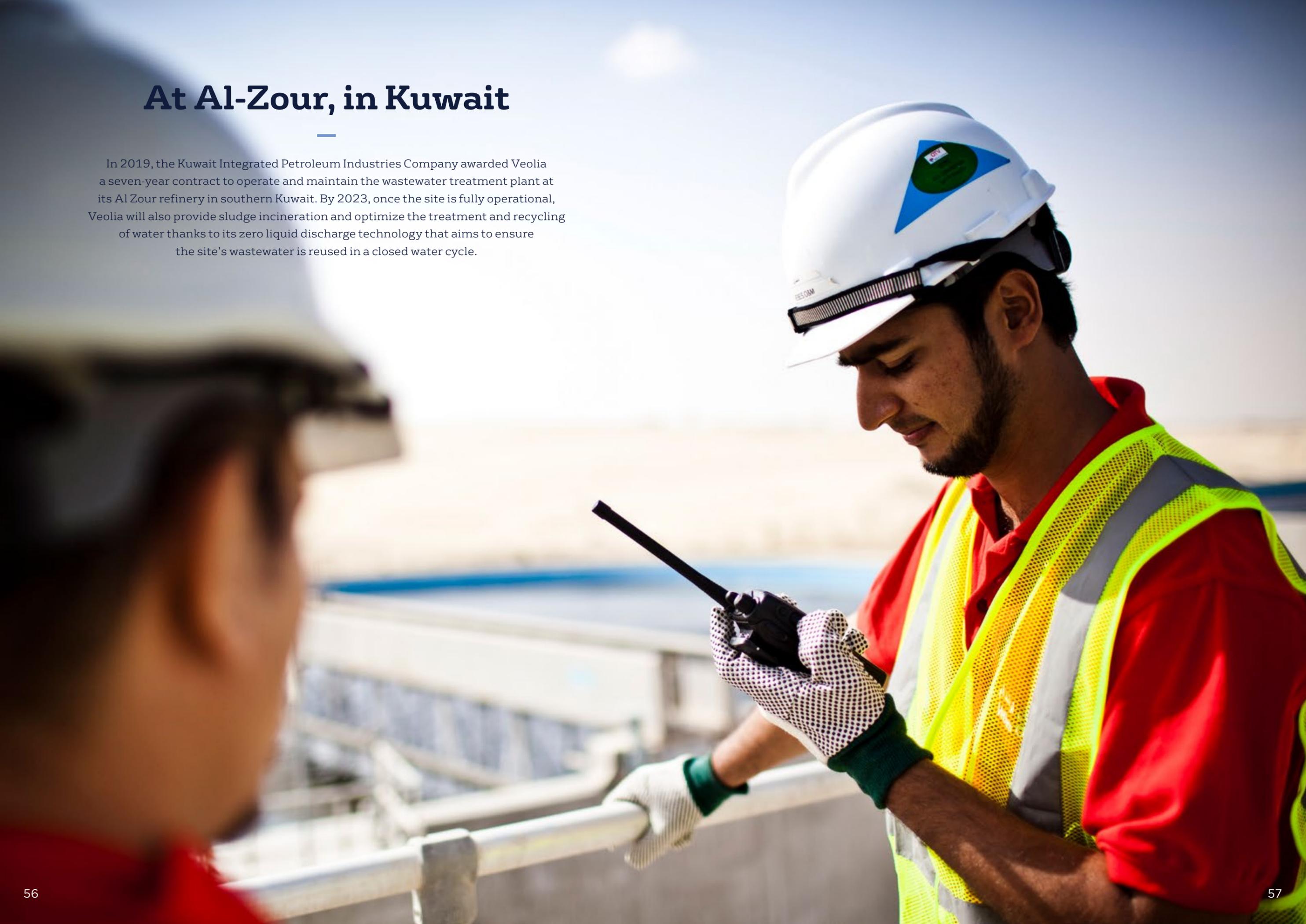
Today, Veolia is expert in the advanced technologies required for reusing wastewater (filtration, oxidation, adsorption and disinfection) and can tailor installations to suit the needs of each client, authority, industrial or agricultural business.

Veolia supports territories worldwide, offering them the most appropriate solutions and strategies according to the local context and ecosystem. Veolia recycles wastewater for crop irrigation and watering. As the world leader in terms of installed capacity, Veolia operates 2,737 wastewater treatment plants and, in 2020, reused 347 million cubic meters from collected and treated wastewater.

Domestic wastewater is a precious source of water and nutrients that Veolia hopes to exploit on a far larger scale.

# At Al-Zour, in Kuwait

In 2019, the Kuwait Integrated Petroleum Industries Company awarded Veolia a seven-year contract to operate and maintain the wastewater treatment plant at its Al Zour refinery in southern Kuwait. By 2023, once the site is fully operational, Veolia will also provide sludge incineration and optimize the treatment and recycling of water thanks to its zero liquid discharge technology that aims to ensure the site's wastewater is reused in a closed water cycle.



## ADVANTAGES: AVOIDING WATER USE CONFLICTS

**W**ater reuse offers multiple advantages: it eases pressures on water resources, decreases conflicts between competing users, secures access to water, improves carbon footprints, ensures continuity of industrial production, etc. In financial terms, reuse is cheaper to implement than seawater desalination. It is also the only resource whose availability increases in tandem



with economic development and that is produced in the places where water tensions already exist, i.e. where demand already exists. Furthermore, in geopolitical terms, reusing wastewater can increase countries' water self-sufficiency. It gives them access to a reliable

local water resource, sheltered from neighboring states.

Yet despite these many advantages, the technology remains in very limited use. Only 4% of wastewater around the world is currently reused by industry or agriculture. Reuse projects have to overcome barriers surrounding local regulations, social acceptability and the fact that natural freshwater is underpriced. In France, less than 1% of wastewater is

recycled. A revolution in water use habits is needed urgently. Some countries have taken major strides in this direction: 90% of treated wastewater is reused in Israel, 14% in Spain and 8% in Italy. Worldwide, about 100 million cubic meters of water are recycled every day.



## IMPACTFUL EXAMPLE

*In China, Veolia provides support for Sinopec (the China Petroleum & Chemical Corp), the largest refinery operator in Asia, in implementing its strategy to reduce the environmental impact of its water use. Beijing Yanshan PetroChemicals (BYP), a Sinopec subsidiary, operates one of Asia's largest synthetic rubber, synthetic resin, phenol, acetone and refined high-grade petroleum product production sites.*

Located in Yanshan, a highly water-stressed region 50 kilometers from Beijing, the petrochemicals complex processes in excess of 10 million metric tons of crude oil a year and requires large amounts of water to operate.

Veolia designed and implemented solutions to optimize freshwater use and increase the recycling rate by taking charge of all water needs: cooling water, distilled water, industrial process water, drinking water, chilled water, wastewater, and water for firefighting. Technologies used include ultrafiltration by reverse osmosis, biological treatment, aerated biofilters, granular activated carbon filters, aerobic activated sludge, and bromine extraction.

By using Veolia's technologies, the complex can now meet China's environmental standards for the discharge of industrial process water, standards that are among the most stringent in the world. Chinese regulations limit dissolved organic carbon to 30 milligrams per liter, compared to 125 milligrams per liter in France. Veolia operates and maintains the wastewater treatment plants and process water facilities, such as the installations for producing cooling water, distilled water and chilled water.



IMPACTFUL SOLUTION

**ENERGY RECOVERY, OR WASTE-TO-ENERGY:**  
A CIRCULAR ECONOMY ENERGY SOURCE

06

# BACKGROUND

**W**ith energy resources becoming rarer and the ecological transformation of our societies under way, Veolia encourages industrial companies to optimize their use of resources. One of Veolia's responses to the environmental challenges facing the planet is the development of a circular economy based on waste recovery. The idea is to transform waste produced by industrial companies into a source of energy, a process known as waste-to-energy.





# SOLUTION

## **RECOVERY OF ORGANIC WASTE**

With this aim in mind, Veolia designs, installs, operates and maintains biomass cogeneration power plants. The biomass used as fuel for these power plants is organic material from a wide variety of sources: residues from forestry, farming (straw, olive stones, etc.) as well as manufacturing by-products (sawdust, wood shavings, coffee grounds, etc.). Once it has been ground and graded to obtain a uniform biofuel, this residual organic material is fed into combustion chambers at cogeneration power plants to produce electricity and heat. The electricity can be used on site or injected into the public grid. By transforming renewable resources that are usually unexploited into electricity and heat energy, biomass cogeneration is an efficient technique that helps industries become more sustainable.

## **RECOVERY OF NON-RECYCLABLE DOMESTIC WASTE**

Veolia uses the same cogeneration principle to recover non-recyclable domestic waste and transform it into energy. Once collected, the waste is transported to an incinerator where it is mixed together then burned at a very high temperature. Solid residues remaining after incineration are removed and recycled into aggregates for earthworks. Reactors neutralize acidic gases and filter bags trap dust, salts and other solids. With cogeneration it is possible both to generate electricity and exploit the residual heat that is produced.

A full-page background image showing a worker in profile, wearing a yellow hard hat, safety glasses, and a high-visibility vest, focused on operating a piece of industrial machinery. The machinery features large, curved, metallic components that create a sense of depth and motion. The lighting is dramatic, with strong highlights and deep shadows, emphasizing the industrial environment.

# ADVANTAGES

**B**y transforming non-recyclable waste into sources of renewable energy, waste-to-energy contributes to the circular economy, reduces the volume of waste at industrial sites and cuts the amount of carbon emitted by industrial companies.

## IMPACTFUL EXAMPLE

*Founded in 1941, the Chilean company Prunesco is the southern hemisphere's leading exporter of prunes and related high-quality products. Every year, over 20,000 metric tons of prunes are produced and exported to over 50 countries worldwide, representing 98% of total production.*

Prunesco was keen to find a way to recover the organic waste generated by its fruit-growing activities. In the past, fruit stones were sent to landfill sites.

Veolia provided Prunesco with a turnkey solution that recovers this biomass and uses it as an energy source. Veolia designed, constructed and financed a boiler and steam generator that use plum stones as fuel, and continues to operate and maintain them.

This solution offers several advantages to Prunesco. In financial terms, it has reduced annual operating costs by more than €175,000. It also optimizes the company's cash resources as the investment finance was provided by Veolia, meaning that Prunesco did not have to provide any capital, which it retained for investments in its core activity. And it secures the company's energy supply.

In environmental terms, the technologies implemented reduce the company's reliance on fossil fuels: today, 30% of Prunesco's energy and 100% of its steam requirements are met using energy produced from its own waste. And Prunesco now enjoys a smaller carbon footprint, thanks to a saving of 4,060 metric tons of annual CO<sub>2</sub> emissions.



## KEY ACTIVITY DATA

A BUSINESS  
LINE OPERATING  
IN ALL INDUSTRIAL  
MARKETS AND ACROSS  
VEOLIA'S THREE ACTIVITIES:  
**WATER, WASTE AND ENERGY**



**€2.75 BILLION**  
OF REVENUE,  
WITH A STRONG PRESENCE  
IN **EUROPE AND ASIA**



**ENERGY & CHEMICALS**  
represent the largest market



with annual revenue  
of **€800 MILLION**



and **CONTINUOUS ANNUAL GROWTH  
OF AROUND 10%**,  
boosted by issues surrounding  
environmental transition

Veolia Communications Department  
October 2021

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Design, writing and creation: Make it Count

Printed on Condat silk - 100% PEFC

# Resourcing the world