# ACCELERATING THE GREEN DEAL through integrated smart environmental technologies and solutions

SUEZ presents its contribution articulated around 3 priorities



## SUEZ's priorities contributing to the Green Deal's ambition

### **Green deal ambition**

### Water quality

- Reducing pollution emissions to water
- Tackling presence of pharmaceuticals in the environment
- Preserving and restoring ecosystems and biodiversity

#### **Industrial water efficiency**

- Reducing pollution emissions to water
- Maintaining European industry's global competitiveness

#### **Air quality**

- Reducing pollution emissions to air
- Preserving Europe's natural capital

Preserving & restoring the environment to protect our health and improve our quality of life

## Water quality

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### Water quality – state of play

- 40% of surface waters (rivers, lakes and transitional and coastal waters) are in good ecological status or potential, and only 38% are in good chemical status<sup>1</sup>
- In 2017, 60 % of water abstracted in Europe was returned to the environment with a certain level of physical or chemical alteration<sup>2</sup>
- 14% total population of Europe under water stress conditions during summer
- Overall, in Europe, water reuse represented only 2.4% in 2015 of the total volume of treated effluents



#### WEF annual report – Global risks 2020

Suez analysis: out of 10 key risks identified, half of them are very directly or directly linked to water availability or quality



# Water quality – fighting pollution in the environment while tapping the potential of municipal water

**Green Deal & policy shift** 

- Reduce pollution at source, particularly in industrial sites and hospitals
- Set more stringent obligations on municipal effluents at wastewater treatment plants to tackle all forms of pollution: pharma residues, microplastics, endocrine disrupting chemicals...
- Promote treated wastewater reuse and nutrients recovery (biosolids, phosphorus, azote)

Existing technologies and research & innovation axis

#### **Required investments**

- **Tertiary wastewater treatment** involving membranes, biological, UV and ozone solutions meet many applications demands while enabling to filter micropollutants and recover valuable materials in water
- Digital & analytics can also prevent pollution of the environment and bathing water by storm water.
- Emerging pollutants & pathogen detection in wastewater: e.g Sars-CoV-2 detection with SUEZ's City Watch
- Energy neutral wastewater treatment plant
- Affordable and compact plants to treat 100% of wastewater across large territories, even for remote communities
   Suez

- €245 billion additional investments are needed in water supply and sanitation until 20271 for EU legislation compliance<sup>1</sup>
- Investing massively in assets and digital tools can lead to a reduction of operational expenses for municipalities as water treatment and sanitation account in average for between 30 to 50% of municipal energy bills<sup>2</sup>
- €154bn, of which €600mn in R&D, should be invested to halt eutrophication of European seas and waters<sup>3</sup>

<sup>&</sup>lt;sup>1</sup> Joint OECD/DG Environment study in 2020

<sup>&</sup>lt;sup>2</sup> IEA World Energy Outlook 2016

<sup>&</sup>lt;sup>3</sup> Target 8 of Mission Starfish 2030 report – September 2020)



### Innovation in progress...

# 100% water reuse, 100% circular... with the Biofactory

#### SPAIN – THE 21<sup>ST</sup> CENTURY WASTEWATER TREATMENT PLANT TO ADDRESS NEW CHALLENGES AND PRODUCE RESOURCES



- The Biofactory plant of Granada reuses **100%** of the treated wastewater by transforming it into **new resources**, such as biogas to generate electricity and heat, or sludge into fertilizers for local farmers
- The treated wastewater is also **reused for different usages**, hence offering alternative water to freshwater abstraction, for local needs (agri, urban, industry).

**Coordinated by SUEZ, LIFE NIMBUS project** aims at demonstrating a biological biogas methanation process to produce biomethane in an urban WWTP with the sufficient quality to be used as biofuel. **€1M funded by EU LIFE program for a project duration of 3 years (2020-2023).** 

# Industrial water quality

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### Industrial water efficiency – state of play

- Global trends forecast 55% worldwide growth in water use by 2050, due to growing demands from manufacturing, thermal electricity generation, agriculture and domestic use<sup>1</sup>
- "[...] **nearly 80%** of the jobs constituting the global workforce are dependent upon having access to an **adequate supply of water and water-related services,** including sanitation". Irina Bokova, Director-General of Unesco
- In Europe, energy production accounts for 18% of total water use and 11 % for manufacturing industries. The forecast indicates a growth until 2050



Note :BRIICS = Brazil, Russia, India, Indonesia, China and South Africa; RoW = rest of the world Source: Environmental Outlook Baseline; output from IMAGE suite of models.

<sup>1</sup> The OECD Environmental Outlook to 2050 (OECD, 2012)

<sup>2</sup> UN Water report 2016: Water and Jobs.

<sup>3</sup> The European Environment – state and outlook 2020 (EEA, 2019)



# Industrial water efficiency – improving industrial water footprint for long-term competitiveness

### **Green Deal & policy shift**

 Existing technologies and
 research & innovation axis

- Make water efficiency and treated wastewater reuse mainstream for all European industrial processes (revision of Industrial Emissions Directive)
- Set stricter obligations on industrial water discharge (revision of Industrial Emissions Directive)

- Full portfolio of advanced treatment
  equipment (membranes, ozone,
  UV...)
- **Digital monitoring & analytics** to optimize water consumption and industrial assets performance
- Specialty chemicals for water treatment
- Digital analytics engines to maintain industrial performance of industries while saving water and energy and reducing costs – EMPOWER<sup>1</sup>
- Next generation chemicals enabling better operational and environmental performance

#### **Required investments**

- The growth in the associated water demand for energy production can be limited to 20%, or even less, if investments are used to:
  - Ensure greater reliance on renewable energy technologies that have minimal water requirements
  - Improve the efficiency of power plants
  - Deploy more advanced cooling systems
  - Encourage the energy sector to exploit non-freshwater sources – saline water, treated wastewater, storm water – and adopt water reuse technologies



### Innovation in progress...

# Manufacturing efficient water treatment technologies... in Europe

#### HUNGARY – EXPANDING PRODUCTION CAPACITY TO MEET DEMAND FOR PERFORMING WATER TREATMENT SOLUTIONS

- SUEZ is investing 30 million euros to expand capabilities in its flagship Hungarian plant in Oroszlany producing ultrafiltration membranes
- 850 employees working in the plant
- The production is sold in Europe and worldwide to better meet stringent wastewater discharge regulations, and to conserve freshwater supplies through water reuse

SUEZ is part of the H2020 Ultimate project promoting "Water Smart Industrial Symbiosis". Deployed on 9 largescale demonstrations across Europe (agri-food, beverages, heavy chemical/petrochemical, biotech industries). The objective is to reuse wastewater, exploit energy and recover materials. The total project is worth €13.4M and runs over 3 years (2020-2023).



# Air quality

## Air quality – state of play

- 400,000 premature deaths per year due to air pollution across the continent<sup>1</sup>
- 93% of Children (< 15y) breathe a polluted air in the world<sup>2</sup>
- Almost 20 % of the EU's urban population lives in areas with concentrations of air pollutants above at least one EU air quality standard<sup>3</sup>
- 77 % of the EU-28 urban population is exposed to PM2.5 concentrations above the WHO Air Quality Guidelines value
- Reductions in air pollution explain up to 15% of recent GDP growth in Europe<sup>4</sup>



Cost per capita of air pollution in European cities – CE Delft report for EPHA – October 2020

<sup>1</sup> European Environment Agency – Air quality in Europe report 2020

<sup>2</sup> World Heath Organization – Air pollution and child health: prescribing clean air, 2018

<sup>3</sup> European Environment Agency – Air quality in Europe report 2020

<sup>4</sup> European Environment Agency – Economic cost of air pollution 2019



## Air quality – improving ambient air to positively impact quality of life

### **Green Deal & policy shift**

- Reduce air pollution levels using updated WHO limits as a minimum point of reference (Revision of Ambient Air Directive)
- Promote the development and ٠ implementation of innovative screening. quantification, capture and treatment solutions to control point diffuse and emissions of contaminants to the air
- Promote innovative solutions for the treatment of indoor and confined air, with a focus on most fragile populations

Existing technologies and research & innovation axis

- Integrated smart solutions to measure, track and anticipate air pollution
- Piloting new technologies for the treatment of indoor and semi-confined air (metro stations, schools, streets, ports)
- Carbon sink carbon capture and air treatment using micro-algae. First results and tests showed reductions in the levels of fine particles (about 66% and 99%)
- Origins.Earth (supported by EU Climate KIC) – real-time monitoring of CO<sub>2</sub> emissions at city scale

#### **Required investments**

- \$5,000bn annual cost of air pollution<sup>1</sup>
- €40 billion yearly of additional investments in 2021-2022 needed in air pollution<sup>2</sup>
- Recent studies show that the multiplier effect of benefits for each dollar spent on measures to improve air quality is 30<sup>3</sup>
- If we apply this multiplier effect to investment needs identified in EU recovery plan: €40bn invested €1,200bn benefits



# Improving air quality where our children spend most of their time... school

#### FRANCE – IMPROVING AIR QUALITY IN SCHOOL PLAYGROUNDS

- Our innovation Combin'air captures a large range of air pollutants such as the fine particles, nitrogen dioxide, the volatile organic compounds to purify the air in the most sensitive areas such as schoolyards
- Ongoing deployment in various schools in France

## Innovation in progress...

As part of the Green Deal calls (January 2021), SUEZ submitted as leader the Air4Health project promoting innovative air quality monitoring networks and tools for better health in urban areas. The project is worth €8.4M.

# **SUEZ's innovation trends**

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# Innovation – Part of SUEZ's DNA and the Green Deal backbone

### **SUEZ'S INNOVATION TRACK-RECORD**

- During 2019 campaign, SUEZ, with various partners, submitted 33 projects to different funding schemes: Horizon2020, EIT Raw Materials and LIFE Programme. 15 of those projects have been selected for a total budget of €110M: 11 in water, 4 in waste in partnership with some of the most relevant European Universities and Research and Technology Organisations (RTOs).
- In January 2021, SUEZ submitted 22 projects to the EU Green Deal Calls.

## **Overview of some SUEZ's R&I projects & customer innovative solutions**





# SUEZ's recommendations on investment drive

# **SUEZ's recommendations on investment drive**

# Water quality & industrial water

- **€220.6bn** until 2030 to halt eutrophication of seas and water and protect water bodies
- **Earmark €900m** from EU innovation funds for R&I in water quality for the next 5 to 7 years **of which €150m** directed to circular approaches in wastewater treatment plants

# **Air pollution**

- Equally important, the intensity of investments for air quality and pollution **Should be at least the same if not higher.** WHO value limits should be enforced.
- **Earmark €1.5bn** from EU innovation funds for R&I in air quality for the next 5 to 7 years