

# The world is facing unprecedented water challenges

An urging need for new technologies & solutions



### **CLIENTS' CHALLENGES**

- > Licence to operate for industries (mining, microelectronics, data centers, F&B industries in water stress zones)
- > Regulatory compliance requiring innovative treatments & investments
- > Resource regeneration (water, strategic metals...)
- Reducing impact on health& environment



# A unique expertise, a global footprint and relentless innovation

To better serve our clients and expand in high-growth offers

### **5 Priority Offers**











MICROPOLLUTANTS
TREATMENT
FROM WATER

WASTEWATER ADVANCED BIOLOGICAL TREATMENT AND REUSE

RECOVERY OF STRATEGIC METALS AND SALTS ULTRAPURE WATER FOR PHARMA & MICROELECTRONICS SUSTAINABLE MODELS DESALINATION



### Water reuse, an effective solution for alternative water

Through wastewater advanced biological treatment

# CHALLENGES Water scarcity & urbanization Only 11% water recycled worldwide Growing reuse demand (6-8%/year)

### **SOLUTIONS**

Advanced biological wastewater treatment

Complete solution: membranes, ZLD, disinfection systems, digital solutions

# CUSTOMER BENEFITS

Advanced technology with max. efficiency

Compact solutions & optimized TCO

Ability to go beyond regulatory compliance

### SUCCESS STORY

F. Wayne Hill WRC, Gwinnett County, US



Indirect reuse: treatment > lake storage > purification > drinking water



**Technologies:** ZeeWeed UF & Ozonia Disinfection



**Result:** 40M gallons reuse water since 2010



### Seawater sustainable desalination

**SOLUTIONS** 

A complementary solution to tackle water scarcity

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### **CUSTOMER BENEFITS**

# **SUCCESS STORY**



**Freshwater scarcity** 

**Energy consumption** & efficiency

**Brine management** & valorisation

**Regulatory pressure** 

**Efficient Reverse** Osmosis (RO)

Membranes and emerging brine valorisation applications

**Pre-treatment** solutions

**Greener & optimised** desalination solutions

**Optimise energy** efficiency (-35% in last 10 years)

Hassyan Seawater Desal Plant, UAE



**Desalination:** RO desal process + optimized design, energy consumption ↓



Technologies: Dissolved air flotation (DAF) clarification & high rate filtration RO membrane filtration



**Result:** energy consumption rate of 2.9 kWh/m3 (divided by 5 vs. thermal technology)



# Micropollutants, a rising issue in water treatment

Tackling health impact challenge

Public pressure on health impacts

New contaminants detection

Regulatory tightening in US, EU

Gap for technology innovation

### **SOLUTIONS**

Separation and concentration with NF/RO membranes

Capture through adsorption, fractionation

Mobile units & equipment

# CUSTOMER BENEFITS

Detection, monitoring at the highest level

Proper treatment and disposal

Compliance with regulations

### WHAT DO WE DO AGAINST PFAS



**Enhanced PFAS retention:** 

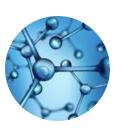
optimized activated carbons, resins & implementation processes



**Technologies:** high-recovery RO membranes, foam fractionation pilots, LEAPfas filter cleaning...



**Result:** track record built in past 3 years, partnering to advance treatment technologies





# Ultrapure water & cutting-edge reclaim

Leading sustainable pharma & microelectronics manufacturing

### **CHALLENGES**

### **Accelerated demand**

License to operate of water-thirsty industries

Most stringent water treatment requirements in industry

### **SOLUTIONS**

Metrology for quality monitoring

High-quality UPW production + reclaim/reuse

Comprehensive Tech portfolio: analyzers, RO, EDI

# **CUSTOMER BENEFITS**

Advanced solutions meeting performance & sustainability standards

Ensure water supply to specifications without interruptions

# **SUCCESS STORY STMicroelectronics, Singapore**



**Reliable UPW fast track supply:** EDI systems operating 24/7 without use of chemicals



**Technologies:** UV, Membrane Degasifier and EDI with no downtime



**Result:** 160m³/hr cost-effective plant delivered in 4 months meeting all water quality requirements





# Recovery of strategic metals and salts

Addressing strategic independance challenge

### **CHALLENGES**

Lithium demand x1.7 by 2030

Securing industrial supply chain

High mining water consumption

High investments needed

### **SOLUTIONS**

Evapo-crystallization and membranes for lithium and gold

Direct Lithium
Extraction & refining
with advanced
processes

Recover sodium sulfate, recycle battery reagents

# **CUSTOMER BENEFITS**

Mitigate environmental impact of mining

**Cost-efficient lithium extraction & refining** 

Turn 'waste' byproducts into valuable materials

### SUCCESS STORY Arcadium Lithium, Japan



Lithium Carbonate Conversion to battery-grade Lithium Hydroxide



**Technologies:** Clarification, lon Exchange purification, evaporation, crystallization & precipitation



**Result:** Exceeding 90% capacity in less than 3 months while meeting product purity specifications





# Veolia ready to take up its stakeholders' water challenges

Technological edge allowing to push value on fast-growing markets



**Driving relentless innovation to guarantee** water availability and quality with ever-more efficient treatment solutions



Enabling industries to reduce water footprint, respect regulations and secure their operations with cutting-edge water technologies

#SpeedUp #ScaleUp #GreenUp

