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Smart & Environmental Solutions for Water Management

Puranut Wisutjindaporn (Pong)
Business Development Manager

SUEZ at a glance

€18 billion
turnover

90,000
employees

on 5
continents

€120 million
invested in R&D

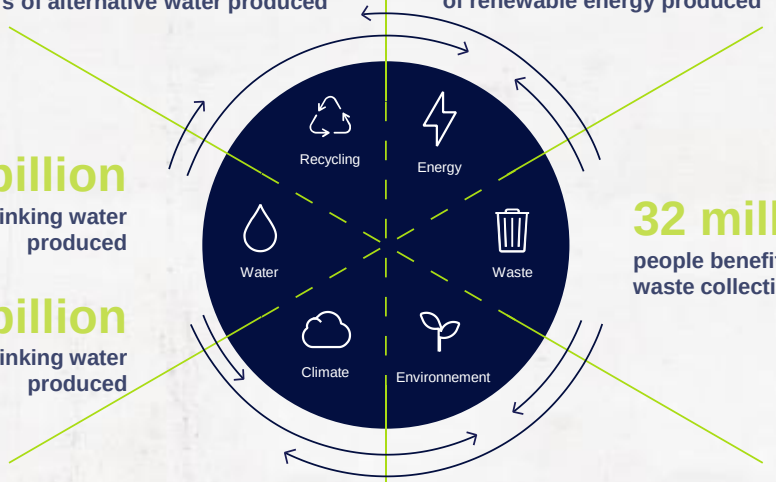
27.6%
of women
in management

4.4 million
tonnes of secondary raw materials produced

1.1 billion
cubic meters of alternative water produced

7.7 TWh
of renewable energy produced

7.6 billion
cubic meters of drinking water produced



32 million
people benefiting from waste collection services

3.4 billion
cubic meters of drinking water produced

10 million
tCO_2e avoided

5.1 billion
cubic meters of wastewater treated

Portfolio of

Smart & Environmental Solutions

Digital & Decentralized

Asset Performance & Revenue Management

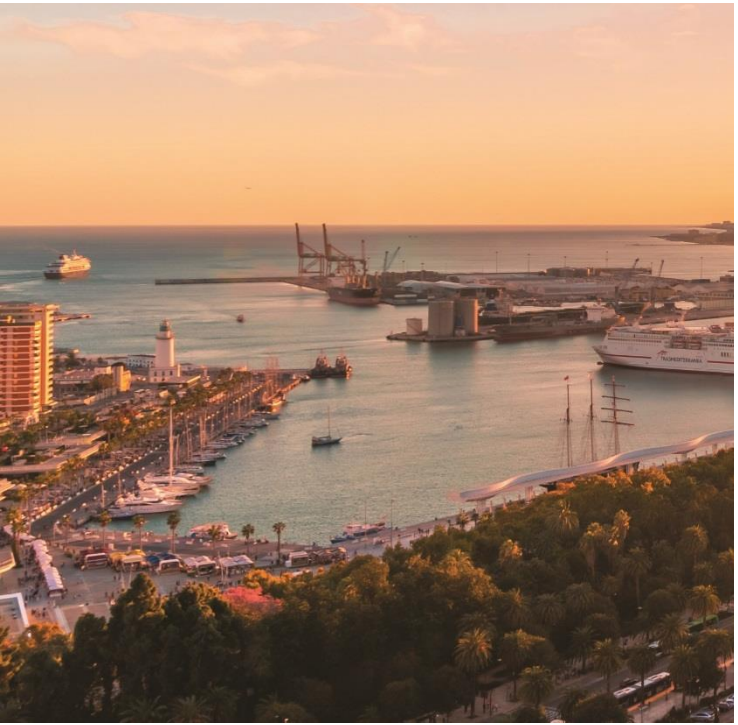
Environmental Quality and Smart Agriculture

Air & Climate

Smart City & Consulting

Digital solutions

for safe, sustainable, resilient and inclusive water management



ON’connect™

- For over 10 years, SUEZ Smart Solutions has been the European leader in smart water metering.
- Benefiting from its unique experience and **4.5 millions of connected sensors**, SUEZ Smart Solutions is also an IoT network operator and a service provider for utilities, cities, and professionals

AQUADVANCED®

- This unique real time integrated platform dedicated to water operations is dealing with the whole water cycle using the latest data treatment sciences
- Relying on an open, scalable and functional architecture, the suite counts over **1,000 global references**

ON'connect™ metering

from manual reading to communicating meters

Manual reading

One to two readings per year
one home meter reader and consumption estimates for invoicing

-

- Invoicing not transparent
- No asset management
- Required travel
- Tedious leak detection

Mobile reading devices

Punctual relief (~ 4 times a year)
passage of a vehicle for invoicing in actual without disturbance and then estimated

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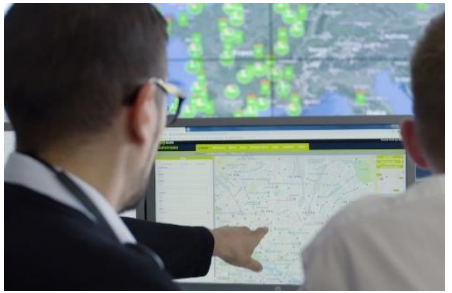
- Data loss
- Required travel
- Permanent emission
- No asset management
- Tedious leak detection
- No associated services

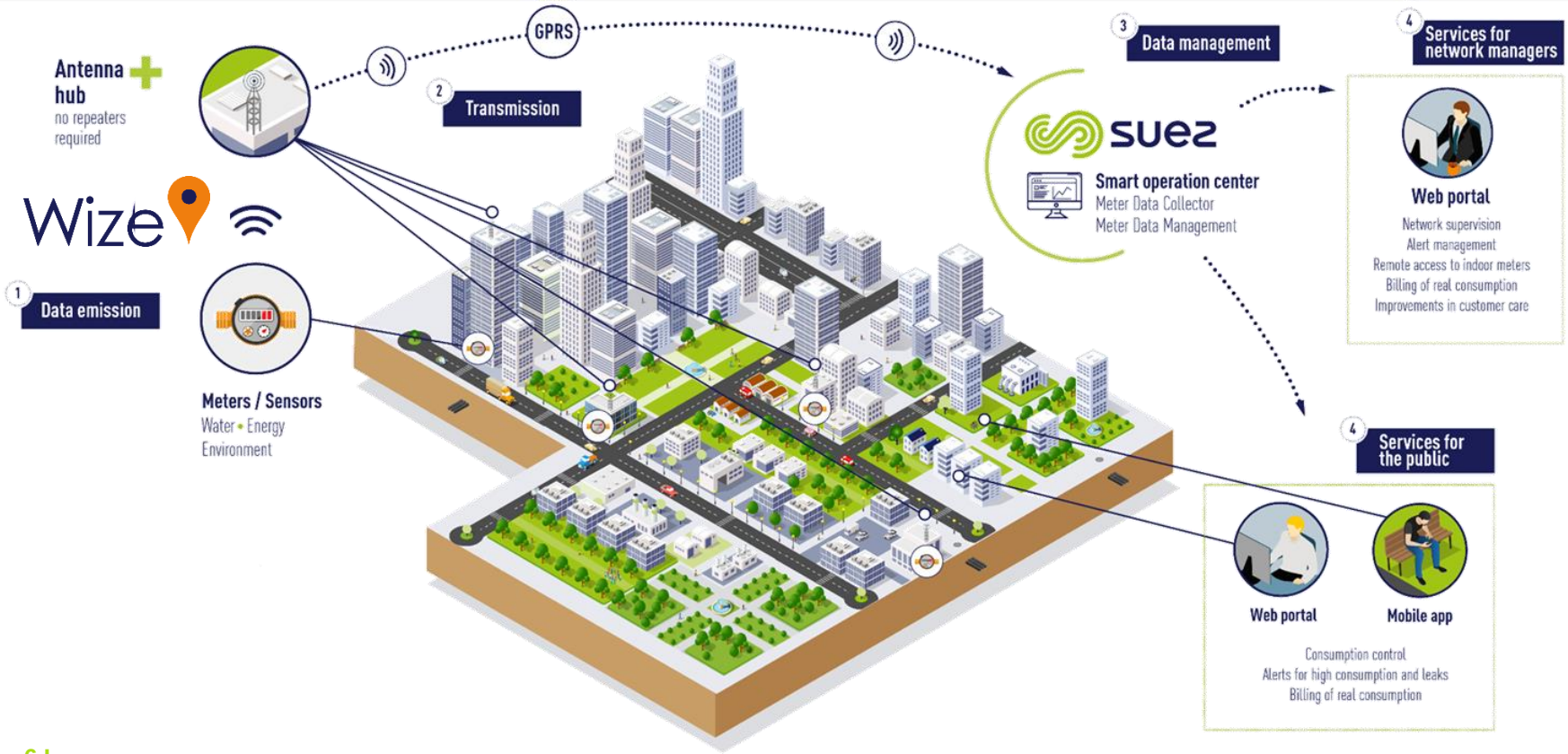
ON'connect™ metering

Smart Meters

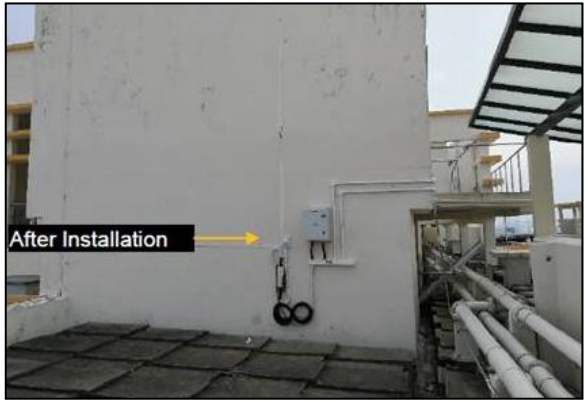


"Remote reading"
Remote multi-daily reading, automatic, sending frequency configurable from 1 to 8 times a day

ON'connect™ from sensors to service



Smart Water Meters



we maintain a strong network of internal and external partners

SUEZ Group innovation ecosystems

for prototype incubation

customers

to collaborate in the design of unique innovative solutions

eau de Paris – L'eau. Un service public
GRDF
PUB Singapore's National Water Agency
SIAAP – Service public de l'assainissement francilien

major industrial players

from our traditional water and wastewater markets

DIEHL Metering
Honeywell
Itron
SENSUS a xylem brand

main IT and electronic firms

to support the industrialization of our digital services

Atos Worldgrid
Sagemcom
IBM
Microsoft

start-ups & SMEs

partnerships to accelerate the implementation of POC and MVP

SAVE INNOVATIONS
s::can
hydrelis

Our solutions for cities

with positive social and environnemental footprint

Water Service Corporation of Malta

operates 250,000 smart water meters to face water scarcity and demand management

ON’connect™ metering

The city of Dunkirk

offers water consumption services to its residents to control budget and reduce carbon footprint

ON’connect™ coach

The city of Nice

uses data from smart water meters to help seniors stay at home while detecting changes in behavior

ON’connect™ generation

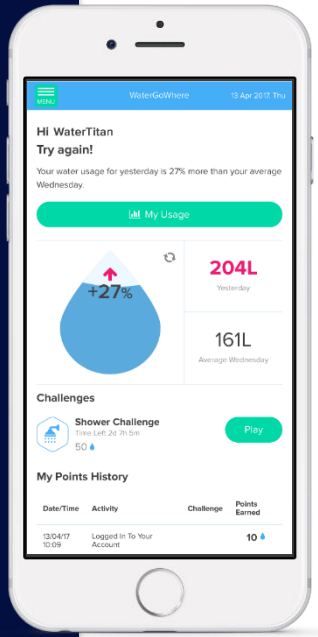
Success Story

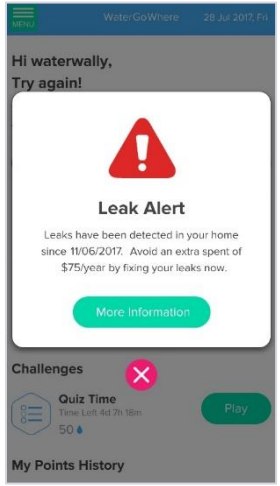
Singapore AMI Trial

AMI Project with PUB

Suez has equipped **1,200 customers** across the country and have been working for **the last 3 years with all PUB's collaborators involved in smart metering,** from engineers to the top management

With the data collected, a gamified mobile application was created to **motivate and increase awareness on residents' water usage**.
The app uses smart metering, analytics and an innovative gamification concept to **engage the residents toward water conservation.**
Beside leak notification, usage monitoring, the residents also receive daily, weekly and monthly challenges to help them reduce their consumption.





AQUADVANCED®,
a real-time software suite
covering the complete water management cycle for water utilities

Advanced control

Predictive analytics

Monitoring

Smart meters **Assets** **GIS** **Quality sensors** **Acoustic loggers** **Interventions**

Numeric models **Pressure sensors** **Radar now casting** **Smart hydrants** **Flowmeters**

DRINKING WATER

AQUADVANCED® Well Watch
Real time performance of wells

AQUADVANCED® Energy
Real-time energy management system for water distribution

AQUADVANCED® Water Networks
Real time performance of drinking water distribution networks

WASTE AND STORM WATER

AQUADVANCED® Urban Drainage

Monitoring

real time monitoring of sewer networks

AQUADVANCED® Urban Drainage

Early warning

flood and natural environment pollution risks

AQUADVANCED® Urban Drainage

Advanced control

optimized control and automatic monitoring of sanitation system

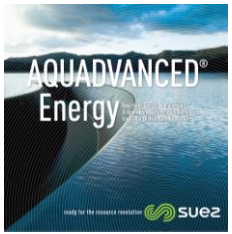
PLANTS

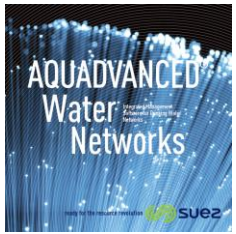
AQUADVANCED® Plants

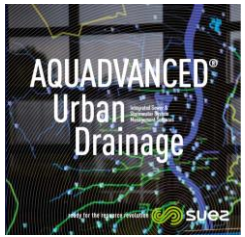
Drinking water

AQUADVANCED® Plants

Wastewater







AQUADVANCED Urban Drainage

Flood control

Limit network overflows and anticipate rain events, improve crisis management and protect citizens and properties.

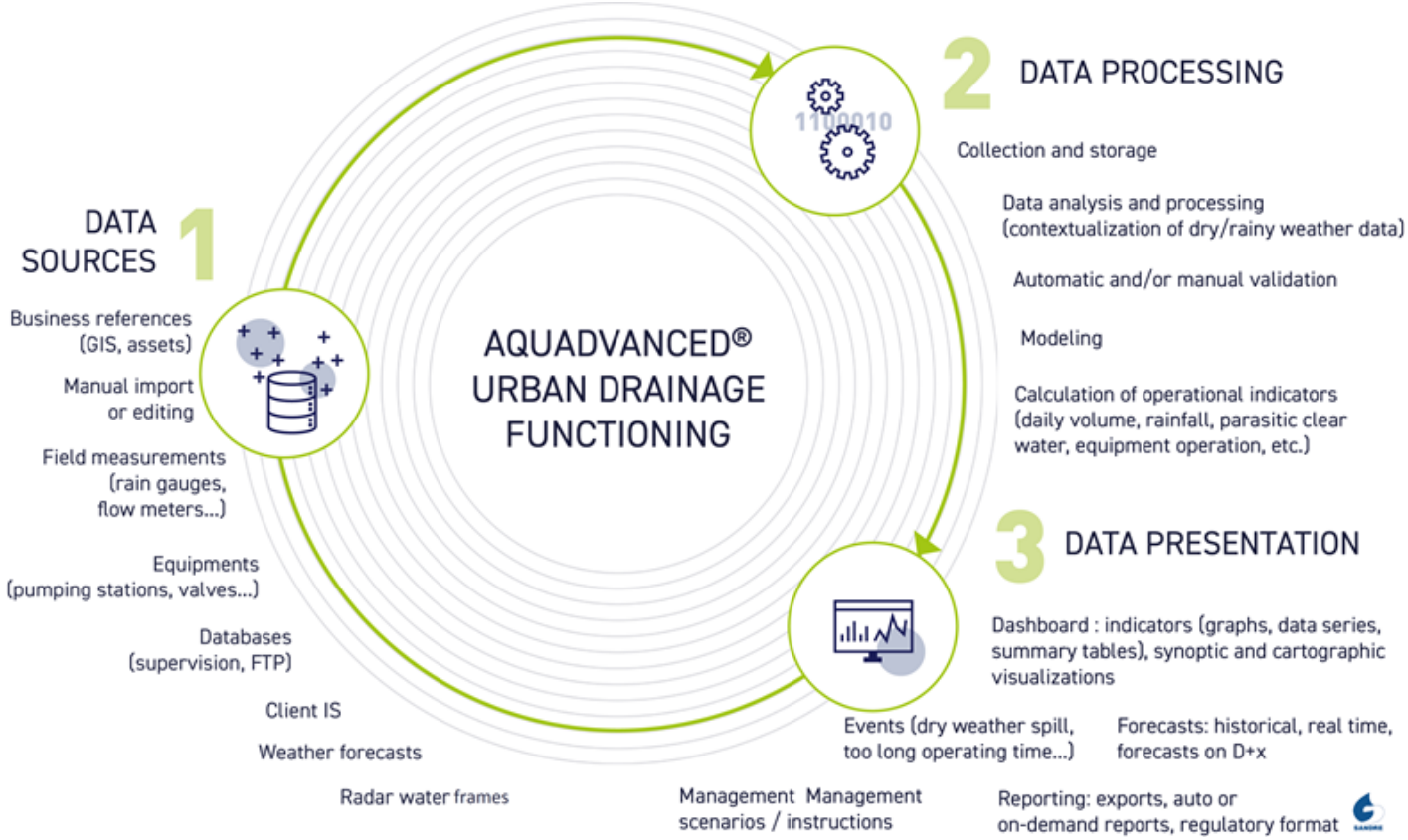
Health, safety and respect of the environment

Limit polluting discharges to the water body, identify the presence of clear parasitic water and comply with water pollution regulations.

operational and economic performance

Secure operations, reduce operating costs and limit investments by valuing existing assets.

How it works


DATA SOURCES 1
Business references (GIS, assets)
Manual import or editing
Field measurements (rain gauges, flow meters...)
Equipments (pumping stations, valves...)
Databases (supervision, FTP)
Client IS
Weather forecasts
Radar water frames
AQUADVANCED® URBAN DRAINAGE FUNCTIONING
2 DATA PROCESSING
Collection and storage
Data analysis and processing (contextualization of dry/rainy weather data)
Automatic and/or manual validation
Modeling
Calculation of operational indicators (daily volume, rainfall, parasitic clear water, equipment operation, etc.)
3 DATA PRESENTATION
Dashboard : indicators (graphs, data series, summary tables), synoptic and cartographic visualizations
Events (dry weather spill, too long operating time...)
Forecasts: historical, real time, forecasts on D+x
Management scenarios / instructions
Management
Reporting: exports, auto or on-demand reports, regulatory format

Use Case: Real-time Decision Support System for the smart management of the stormwater network in Singapore

Advanced Control

With about 2,400 mm of rainfall every year and 5.5 million inhabitants over a land area of 720 km², Singapore faces both flood risks and water scarcity. This unique challenge led to unique strategies designed and implemented by the PUB, Singapore's National Water Agency.

WHY

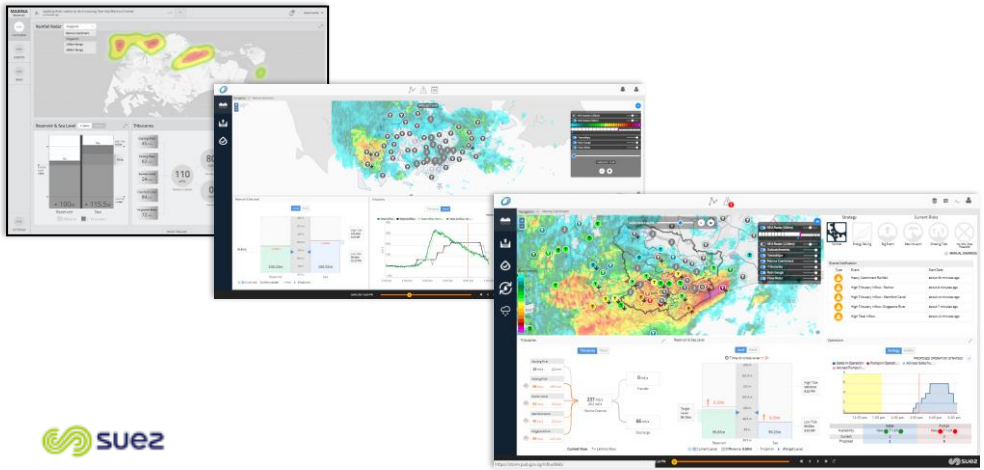
- Real-time operational advisory platform to assist operators at Marina Barrage
- Monitoring of storm water network & anticipation of flash floods
- Water quality monitoring and modelling of reservoirs and waterways
- Real-time monitoring of reservoir operations and transfers

HOW

- Deployment of AQUADVANCED Urban Drainage
- Tailor-made dashboards that meet operator's requirements
- Integration of a wide variety of sensors, radar, and CCTV to monitor storm water networks and WQ in reservoirs and waterways
- Integration of various 1D-Hydraulic and 3D-WQ models to enable anticipation of floods in the city and WQ anomalies in the reservoirs.

WHAT

- Real-time decision support system for operations at Marina Barrage
- Seamless integration of multiple data sources, models, and presentation of actionable items to operators
- Auto-detection of WQ anomalies based on live sensor readings
- Real-time computation of rainfall return-periods and fast-rising water levels to enable flash flood anticipation



AQUADVANCED® Plant

Transforms the management of drinking water and wastewater plants

Hypervision

Forecast

Optimization

AQUADVANCED® Plant

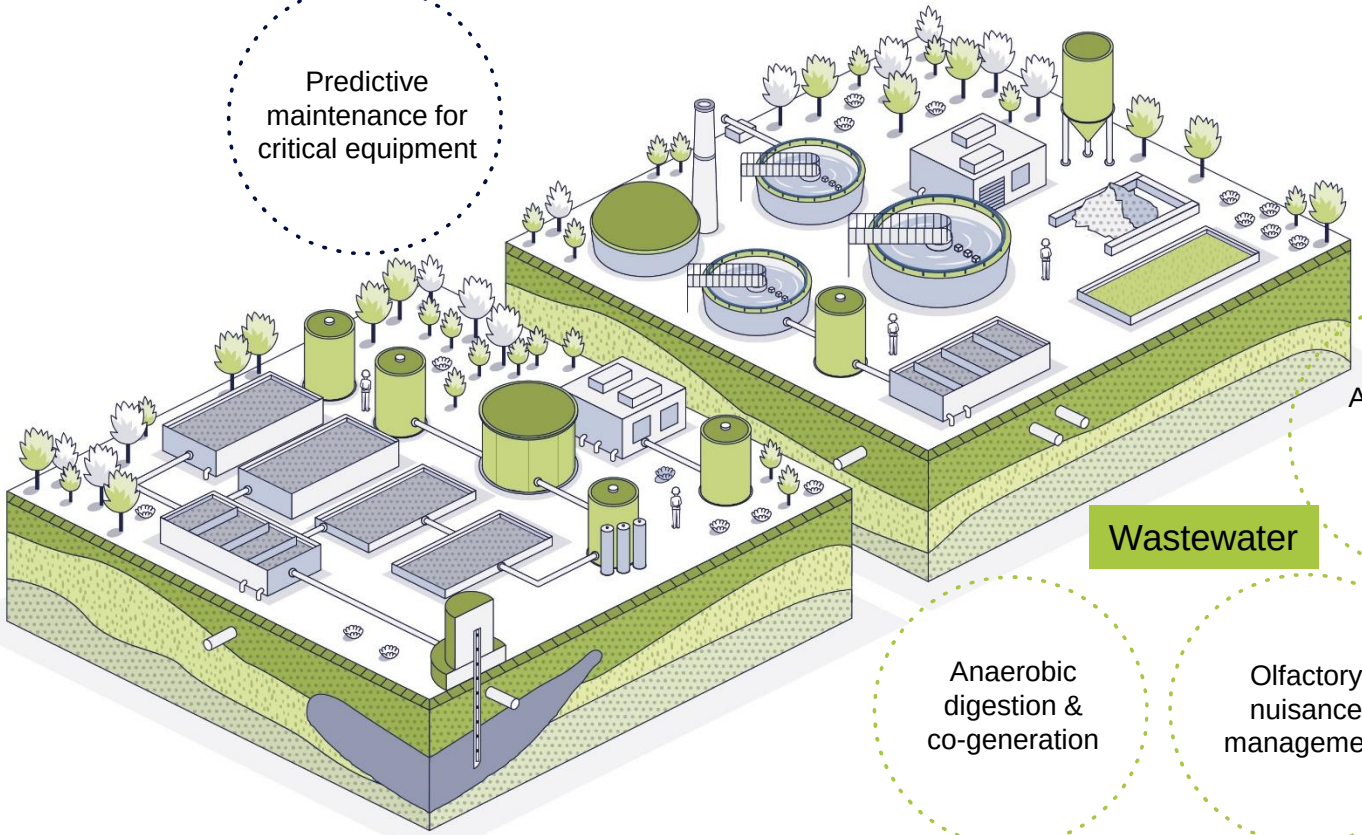
Optimization, predictive and control modules

Drinking water

Predictive maintenance for critical equipment

Settling & filtration optimization

Membranes maintenance



Wastewater

Aeration and biological treatment control

Anaerobic digestion & co-generation

Olfactory nuisance management

References
Drinking water treatment plants

Optimisation

Chongqing, China

Optimising coagulant dosage in settling process
Reduction of coagulant OPEX -20%

Optimising water losses in filtering process
Reduction of water losses -40%

Morsang-sur-Seine, France

150 000 m3/day water production

Optimising coagulant and PAC dosages
Reactives savings > 50 k€ / an

References
Wastewater treatment plants

Saint-Jean de Luz, France

Optimising aeration energy
Optimal adjustment between the activated sludge concentration, the aeration energy and the sludge quality
Energy consumption of blowers - 9%

Optimising dryness of sludge
Monitoring, analszing and optimising sludge dryness weekly
Sludge disposal costs - 5%

Biarritz, France

Optimising the Biofors' energy
Daily optimal adjustments between the average speed of blowers and effluent water quality
Energy consumption of blowers - 6%

Correction of ventilator drift
Daily monitoring of the submeter of ventilation process
Electrical consumption of ventilation process - 14%

Asset Management

Data from the assets

Additional data

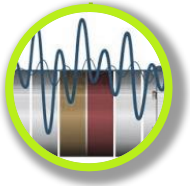
From data to …

… an advanced Asset Servicing

Data driven multi-asset servicing to reduce risks and costs, and improve the level of service

Data Modelling

ASSETADVANCED Asset Management



Field Assessment Technologies

AQUADVANCED Real-Time Hypervision & Event Detection

Asset Advanced
Plan your asset renovation in 6 steps

Data Engineering

Relevant data collected from different sources - GIS, CMMS, EAM, CRM, simulation models - is processed and **stored** in one **single database, processed,** and **accessible** from a **unique** platform

Condition assessment

Assess the current state of **asset degradation. Map your entire network** with minimal inspections.

Failure analysis

Predict the **evolution of asset degradation** according to multiple degradation factors.
Get access to a library of **advanced models** for each asset according to your needs (multi-criteria, stochastic and machine-learning).

Risk analysis

Predict the evolution of risk, taking into account financial, social and environmental **consequences** of failure.
Evaluate the impact of failure in service levels.

Prioritize

Define **renovation priorities** considering investment limitations, long term impact of cost of operations increase and risk exposure.
Define **alternatives to renovation** to preserve your assets in the long-run.

Geo-spatial grouping

Group and **rationalise tasks** for different assets in the same area and create a **practical renewal plan**.

Our solution

Visualise all your assets and their risk of failure in one single platform

- **Visualise all your assets** in one place
- Identify your assets **at most risk** in one glance
- **Compare different scenario** in the dynamic dashboard depending on the budget allocated
- Anticipate **impacts of asset failure, renovation and maintenance** on the environment, your customers and your finances
- Platform software to **fit your objectives**, **constraints** and **asset models**
- Plan your **renovation and maintenance** rounds depending on the priority

Thank you

Please contact:
Puranut Wisutjindaporn (Pong)
Business Development Manager
Smart & Environmental Solutions
puranut.w@suez.com