The needs of the drinking water sector, the Acciona Agua perspective

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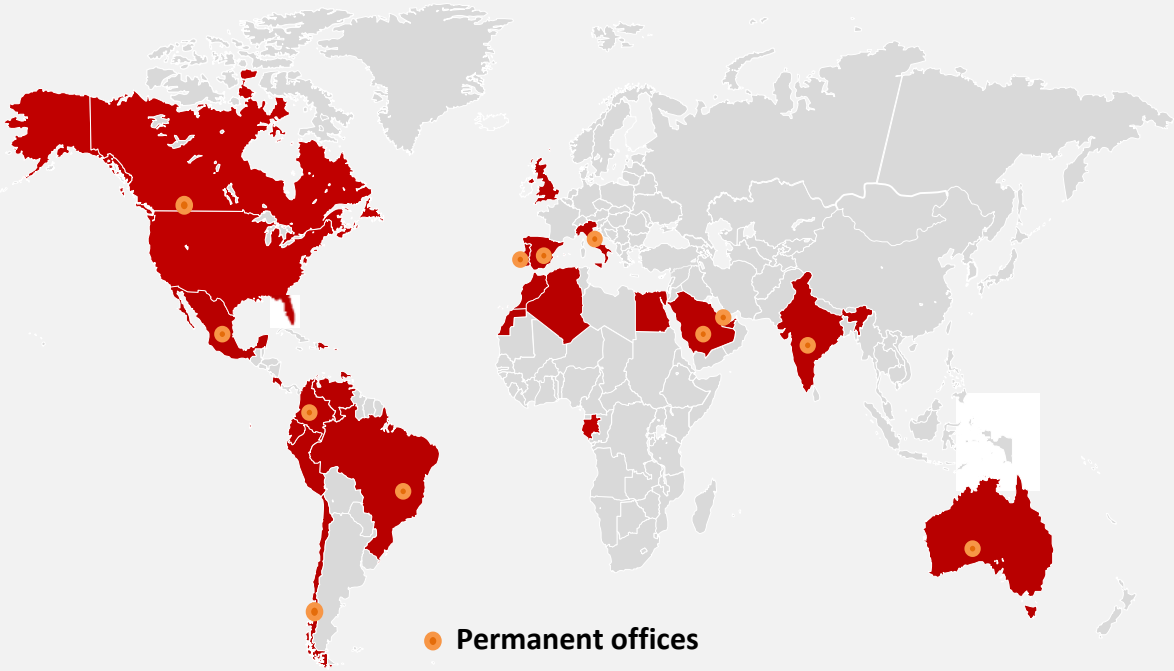
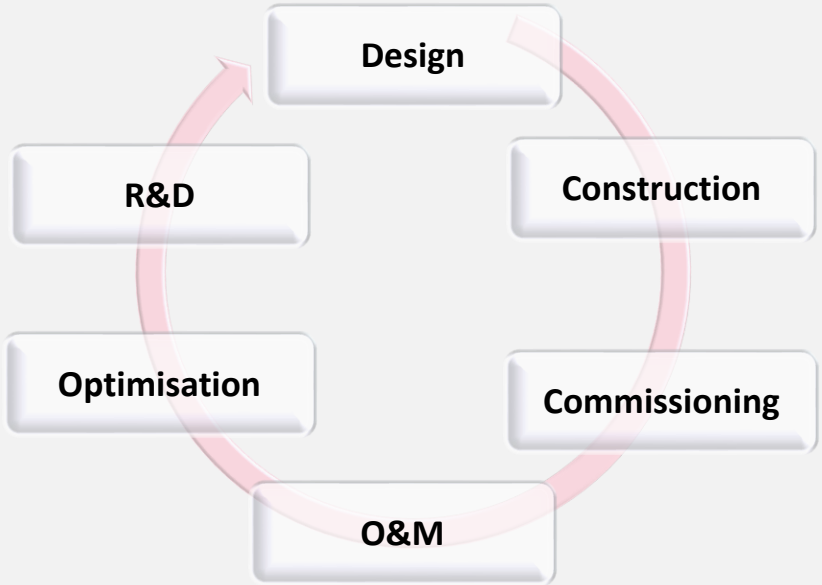
Acciona Agua: Key Figures

- **ACCIONA**: a leader in the promotion and management of infrastructure (construction, industrial and water services), and renewable energy.
- **ACCIONA Agua**: Design, built, operation and management of integral services of water treatment plants.
  - + 70 mill. people.
  - + 30 countries.

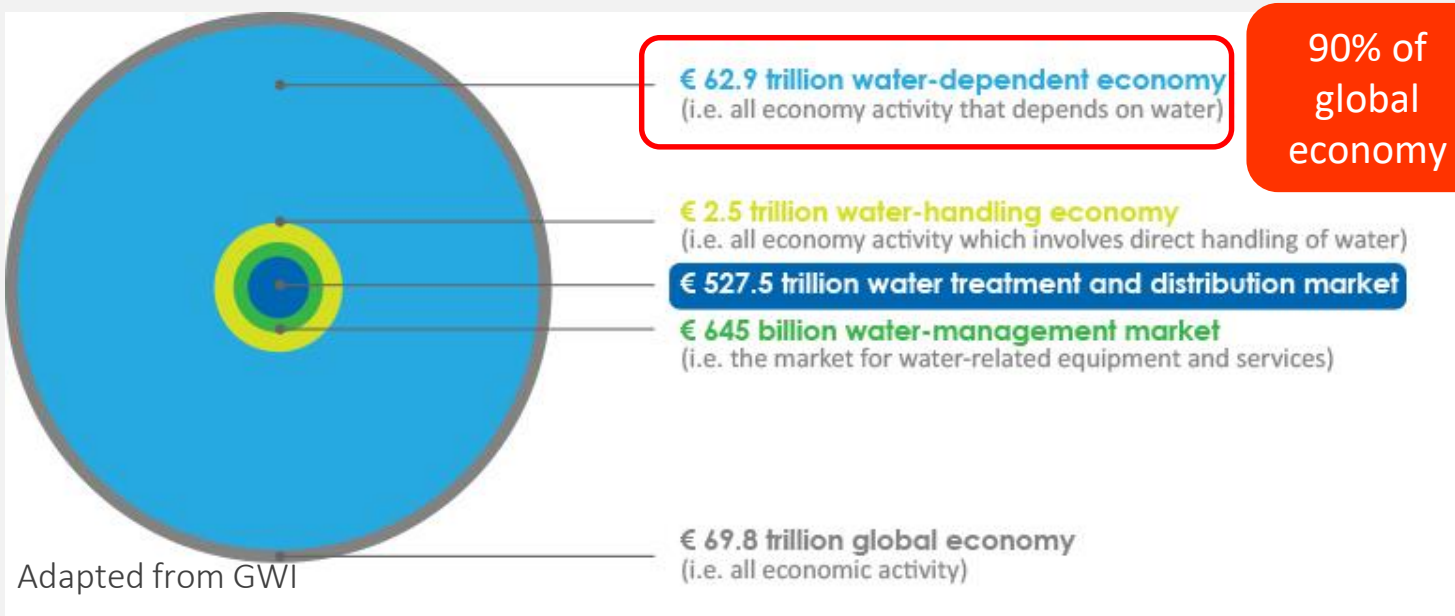




- Worldwide leader in Reverse Osmosis (RO) **desalination**. More than 75 desalination plants (2,5 million m^3/day of installed capacity).
- **Wastewater, treatment and reuse** (more than 400 plants built)
- More than 100 conventional plants operating and 40 **supply services**

EMPHASIS & RECOGNISE THE **TRUE VALUE OF WATER**

Without water almost everything else in the 68.8 Trillion Euro global economy would fail!



Adapted from GWI

Trends and Challenges:

- World-wide growth in **water use** with 55% by 2050
- Diffuse **pollution**: affects 90% of river basin districts, 50% of surface water bodies and 33% of groundwater bodies across the EU
- Europe **water demand**: stabilise towards 2050 at around 1.000 km3/yr
- **Water scarcity** is already a serious problem in 11% of EU, grow to 30% in 2030.
- Increasing effects and costs (60%) of **climate change** due to floods and droughts .

Needs for innovation:

- Novel solutions and routes towards important **reduction of fresh-water extraction** from our natural eco-system, while **making available sufficient water sources** for the European and global economy.
- Innovations to secure protection of our **natural environment, resilience and reduced vulnerability** against external events (climate, terrorism).

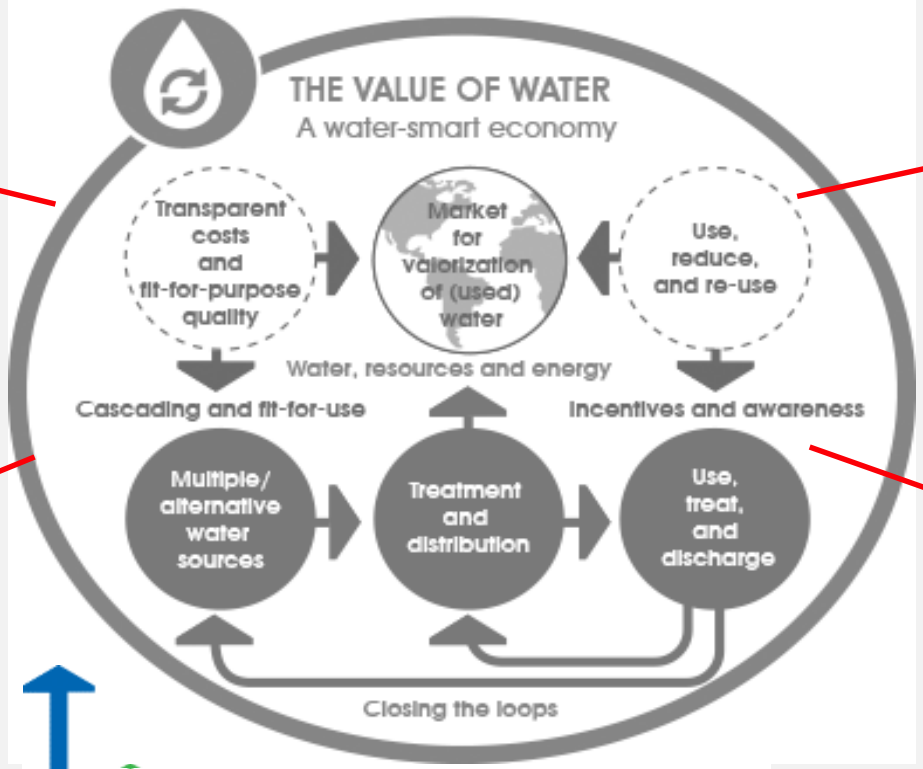
A future proof model for water-smart societies

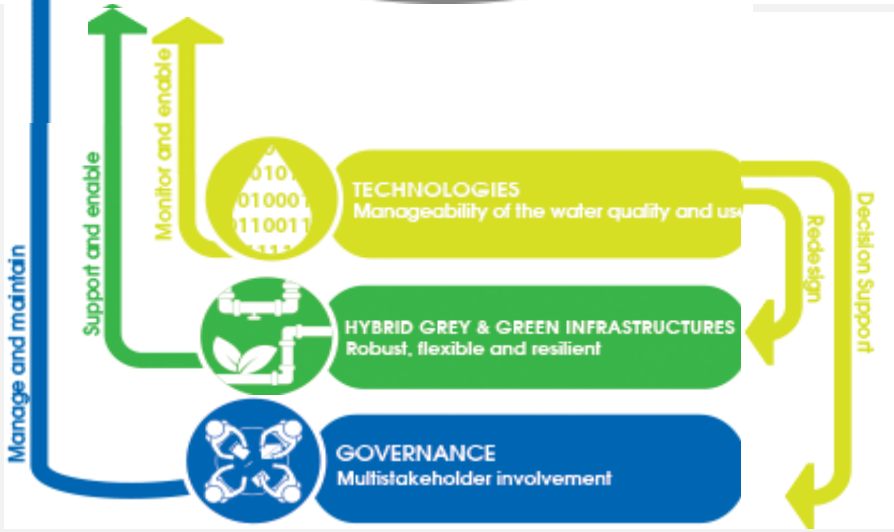
Developing a water-smart economy

Rational use of multiple waters & boost markets

Multiple Waters, for multiple purposes and users

Increase circularity in the water economy





Digital revolution

- The use of digital solutions and data-driven technologies has revolutionised business operations in different industries and now the water sector is ready to reap the benefits these systems can bring.

- GWI estimates that the global market for control and monitoring solutions in the water sector will be:
  - $21.3 billion in 2016.
  - Growing to $30.1 billion in 2021 with a CAGR of 7.2%.
  - Spending on advanced data management and analysis solutions is expected to grow even faster, at 11.9% a year.

- This digital concept can also be applied on **seawater desalination** plants, in which the integration enables the water end-user or plant operator to derive valuable, actionable information.

SW4EU aims to promote innovative solutions for the smart, efficient, and sustainable water management.

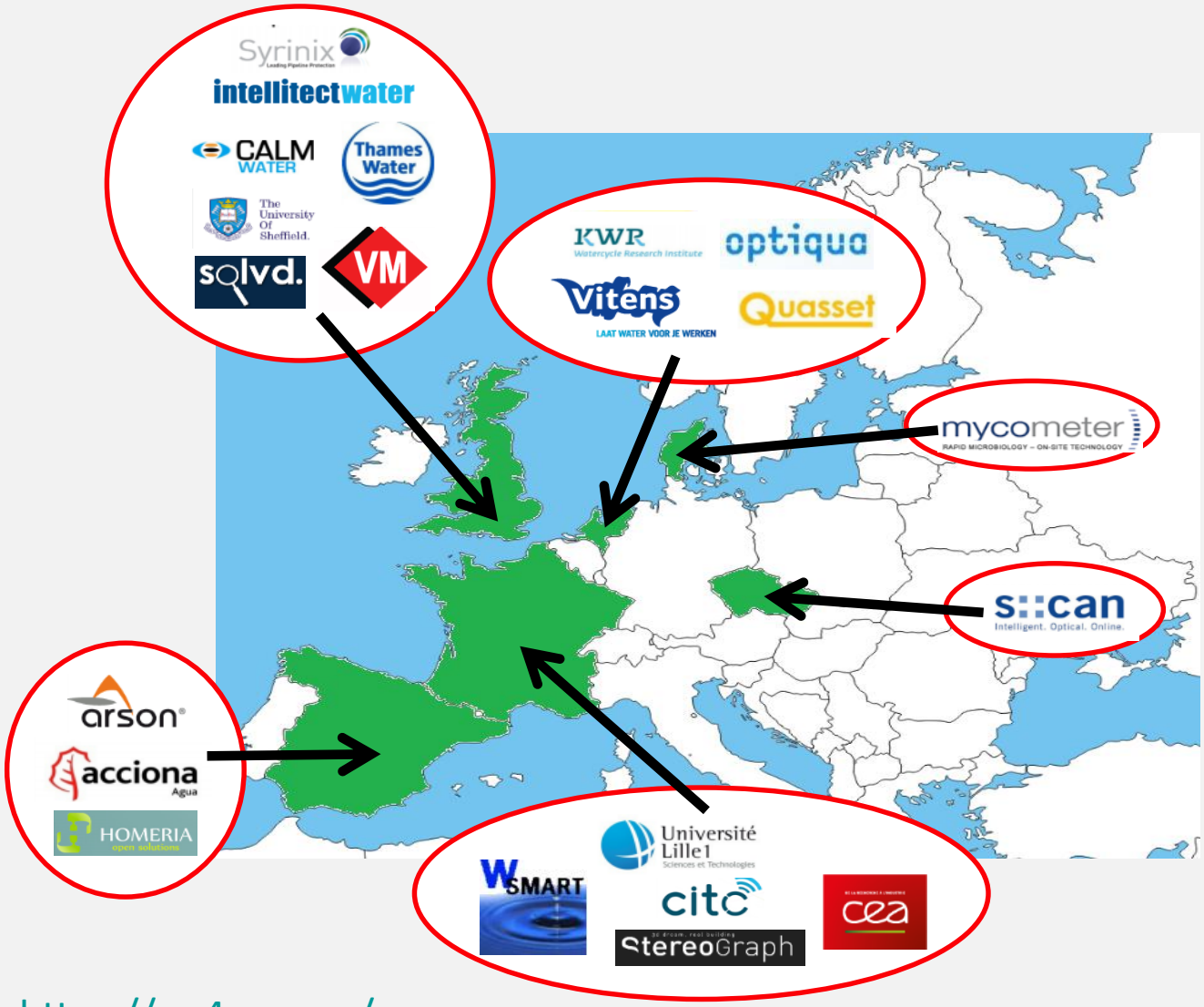
1 Real time water quality monitoring.

2 Leakeage early detection and prevention.

3 Optimisation of the energy consumption.

4 Interaction with the final users.

5 Integrated solutions.



https://sw4eu.com/

SWING

Smart Water Innovation Network in the city of BurGos

Number of contracts

58.507

Yearly water treated (2014)

25.461.692 m³

Yearly water invoiced

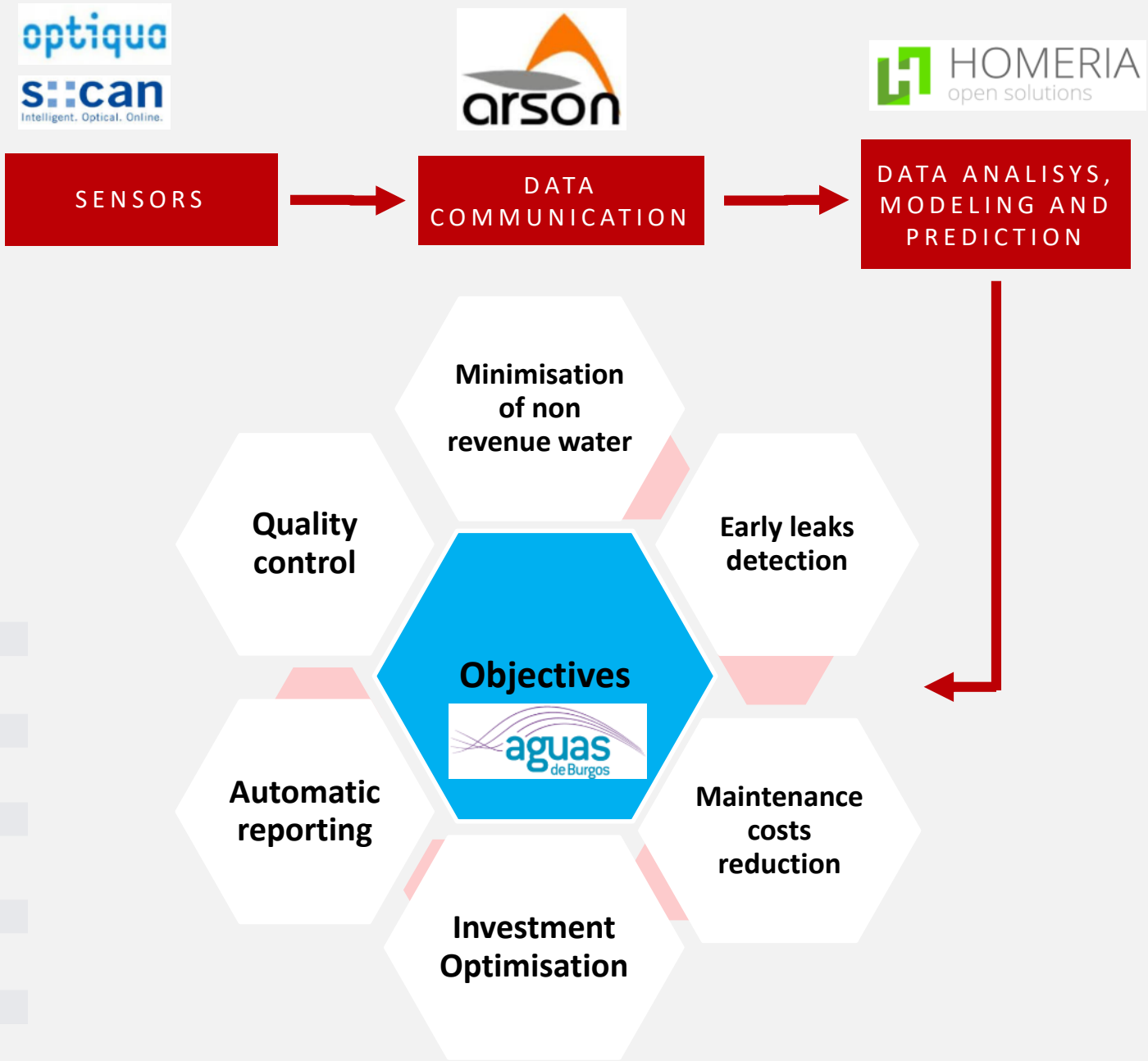
21.455.125 m³

Water distribution network length

467.315 m

Water supplied person/day

392,39 litres

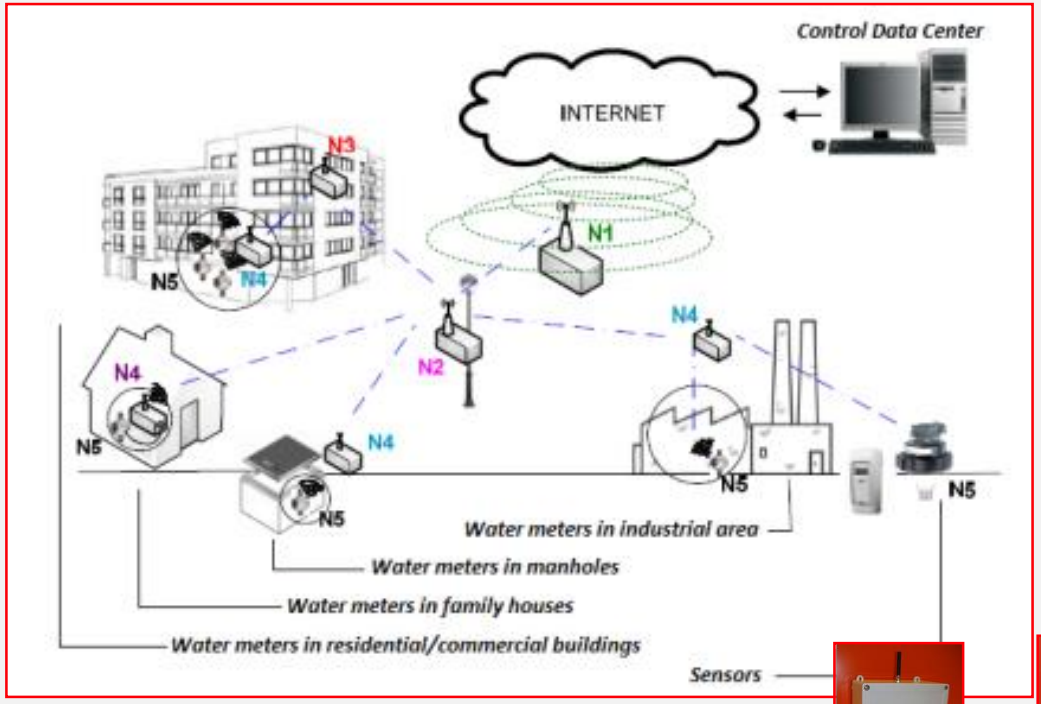


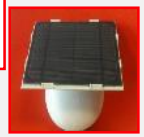
Data collection

1 Water quality sensors

2 Smart meters

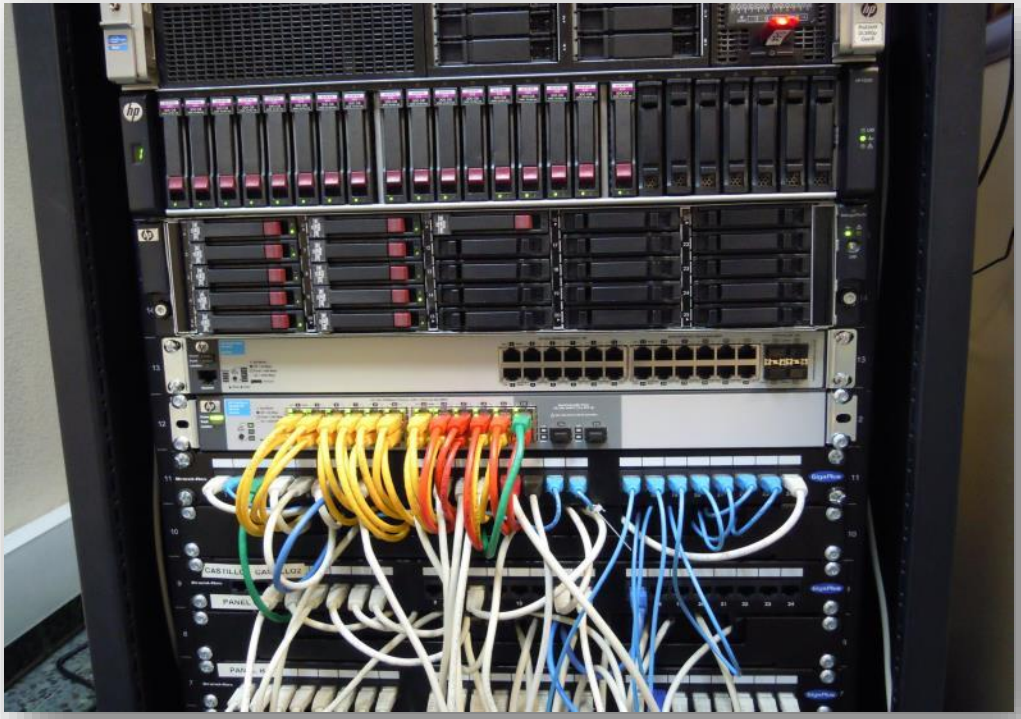
Data communication





SECTOR	N4UNE	N4 RF	N2	N1	Smart meters
INDUSTRIAL (Villalonquéjar)	-	20	1	1	177
URBAN (Virgen del Manzano)	6	32	1	1	442
RESIDENTIAL (B. Yagüe)	22	38	2	2	877
TOTAL	**28**	**90**	**4**	**4**	**1.496**

Big Data Center



Open protocol

100% Free software

Security

Data Shielding

Replication

Fiability, consistency adn data quality

Business Intelligence Platform

SICAB

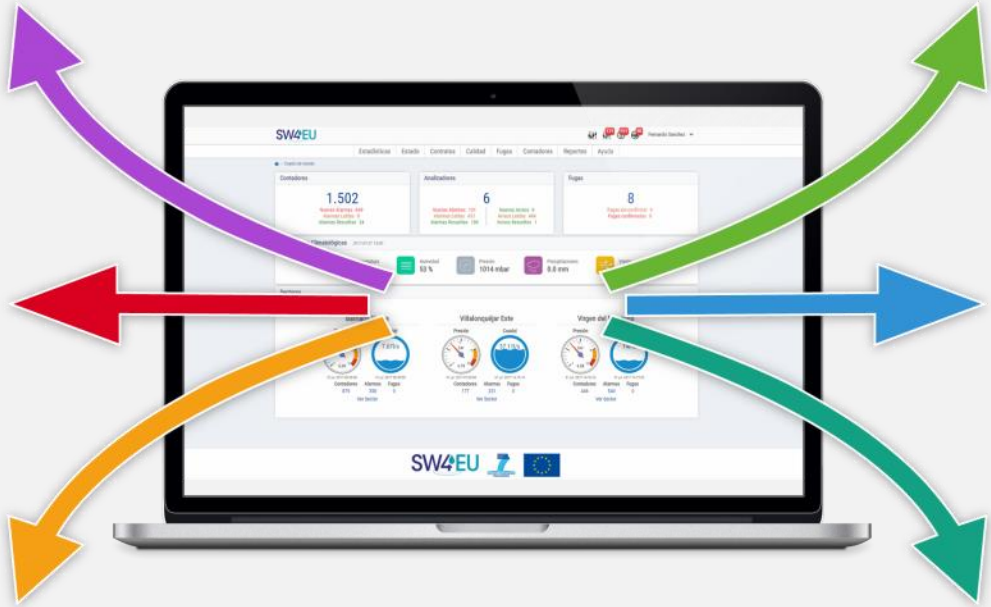
Software for the users managemet

ACCIONA SCADA

Integration of the quality sensors

Leakage

Leakage control



GIS

Igeographical information per sector

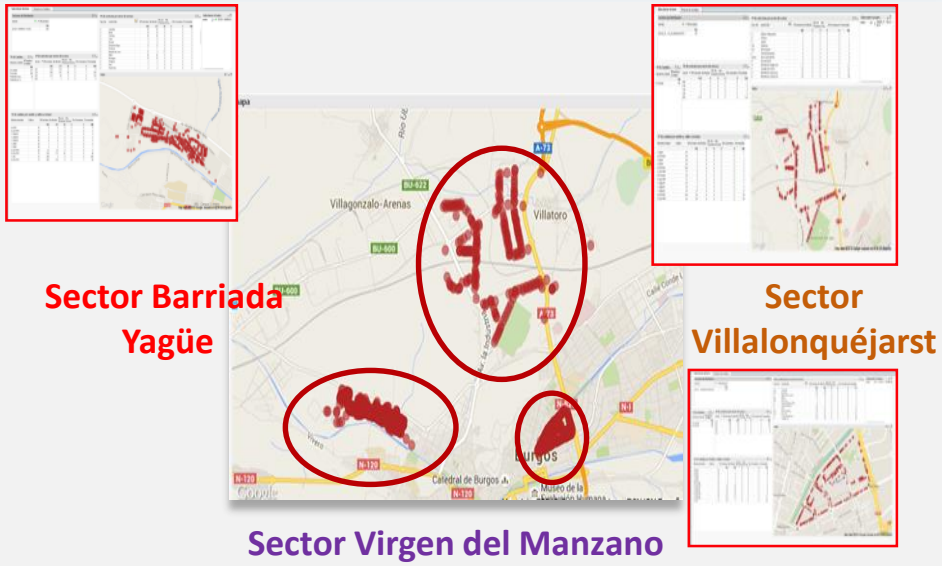
Smart meters network

Smart meters conection

SCADA

Conection with the telecontrol

Leakage detection



1 Smart meters

Automatic detection

2 Algorithms

Hydralulic balance

Nights minimum consumption

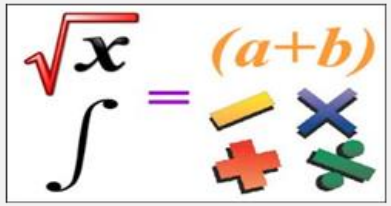
Consumption prediction

3 Improved Algorithms

Pattern-based forecasting algorithm

SMART MANAGEMENT OF A DESALINATION PLANTS COUPLING IoT AND BIG DATA

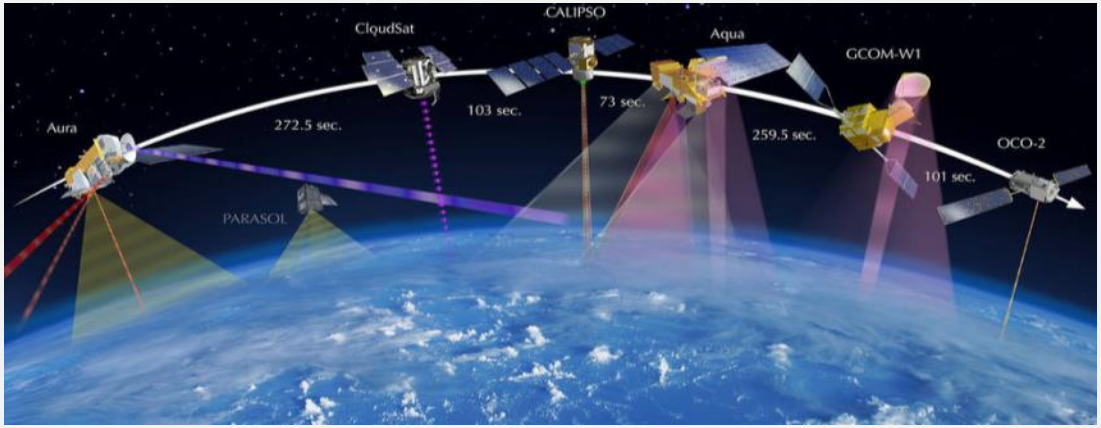
- New operational strategies in a desalination plant gathering high volumes of data (Big Data) from a wide range of own and commercial sensors (IoT).
- Implementation of **Big Data** to develop better **RO system models, controls and operational rules. Data analytics.**

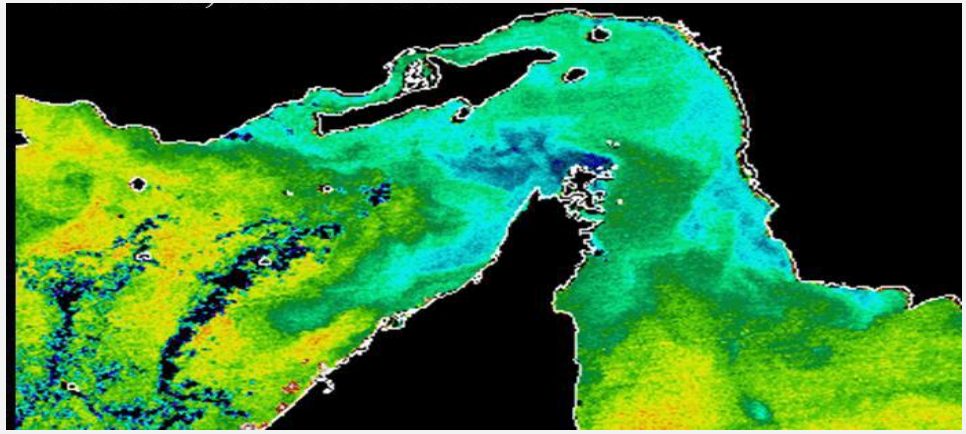


SENSORS → DATA COMMUNICATION → DATA MANAGEMENT → MODELLING OF PREDICTIVE MODELS

SMART MANAGEMENT OF A DESALINATION PLANTS COUPLING IoT AND BIG DATA

- Integrate data from within desalination plant itself.
- Weather forecast information.
- Geological data, and data from satellites (about currents, algae blooms, seawater temperature, etc...).





...and analyse these together in order to **prevent events** than could affect to the plant performance, **where** it may occur, what **needs** to be done to prevent this from occurring, and prevent the inevitable effects on the plant performance.

Thank you