ULTIMATE

WATER SMART INDUSTRIAL SYMBIOSIS

TRANSITION FROM LINEAR TO CIRCULAR ECONOMY

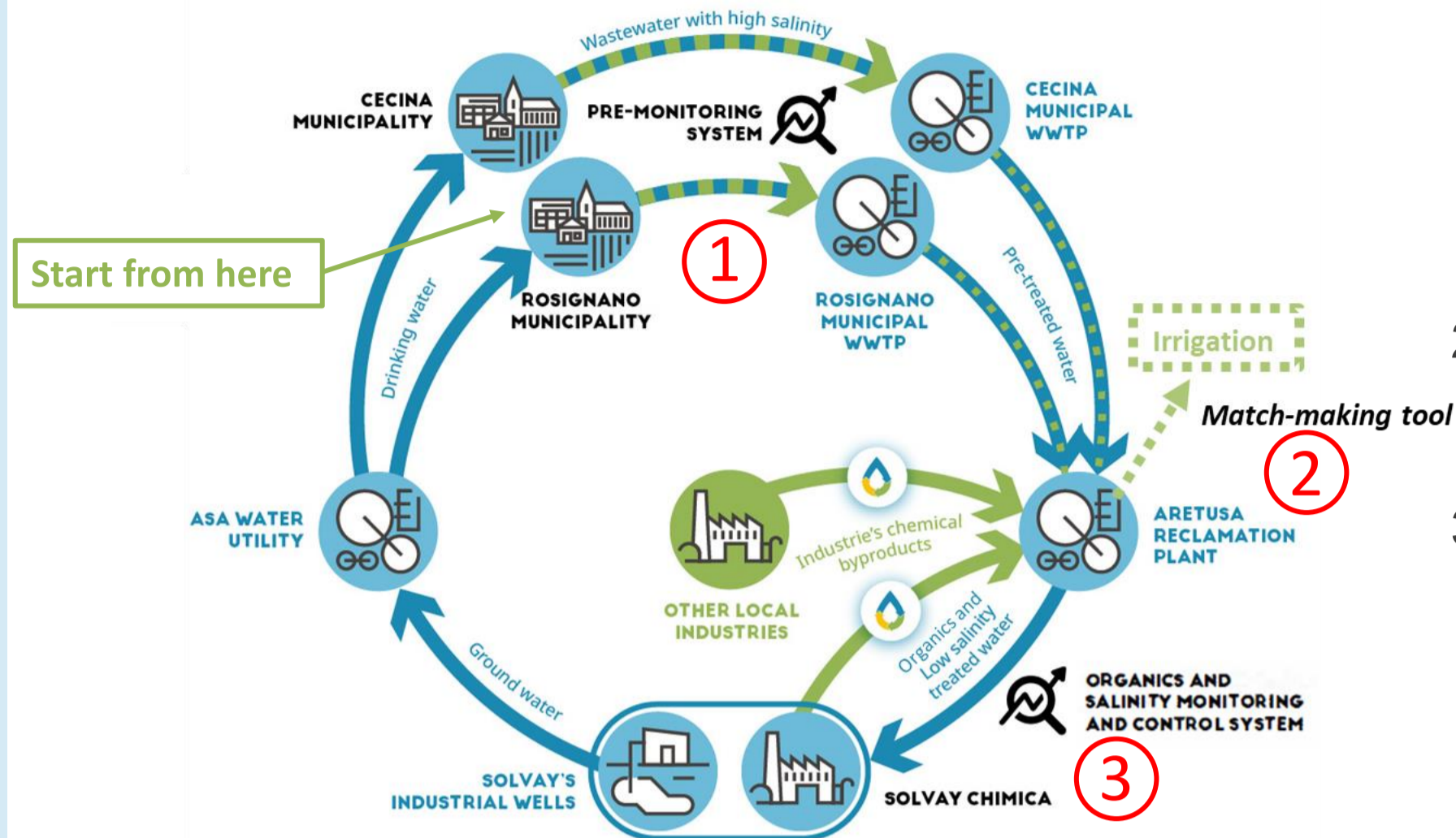**in the nexus of the water sector & intensive water consuming industries.**

CS3 – Production of fit-for-purpose water

Objectives:

1. Real-time measurements and data driven approach to monitor salinity intrusion in sewer networks → Development of an Early Warning System

2. Reduction of chlorides via Smart Equalization of flow rate entering the plant → Automation of the equalization system based on wastewater quality forecast

3. Production of fit-for-purpose water for industrial processes and feasibility study of other potential reuse strategies → Utility-Industry B2B Matchmaking Digital Platform to manage water reuse opportunities
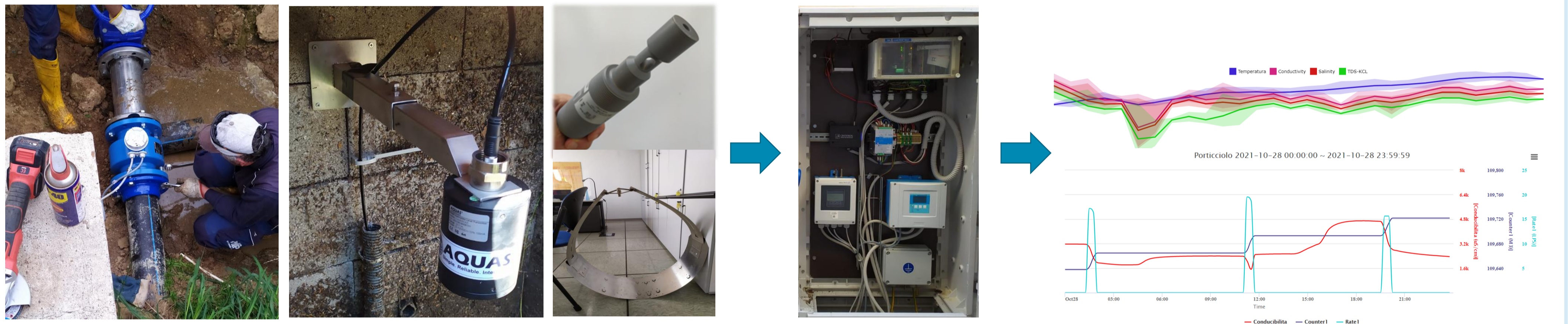

First results – Modeling & Calibration of the sewer system

→ Targeted sampling campaigns in Cecina and Rosignano sewer system / WWTPs and identification of on-line monitoring points (Flowrate & Conductivity);

→ Analysis of the sewer network and experimental validation of the SWMM model to be integrated with WWT models;

→ Analysis of quality fluctuation of wastewater coming from Cecina & Rosignano WWTP and definition of the algorithm to control the *Smart Equalization*;

→ Preliminary evaluation of opportunities for water reuse in agriculture (Matchmaking platform).
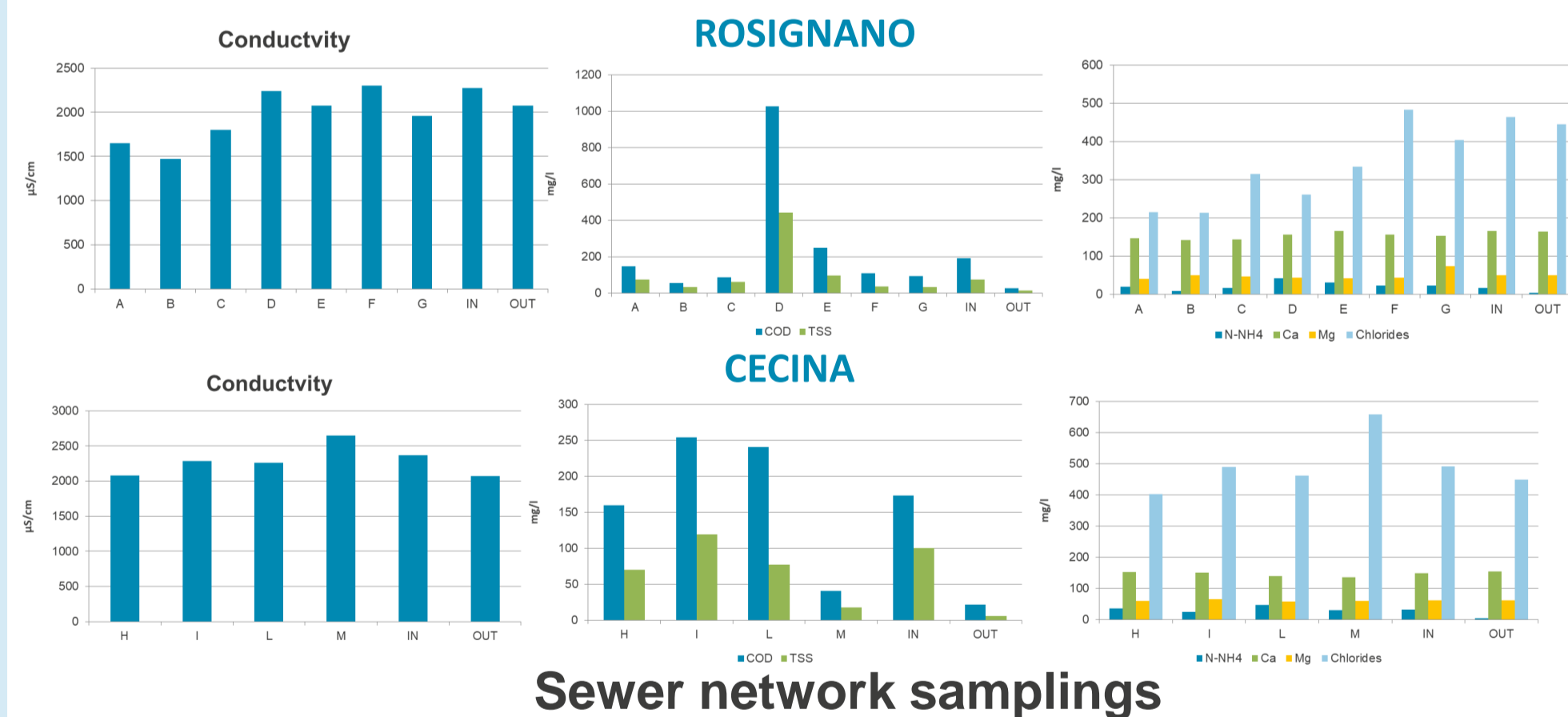
Sewer network samplings
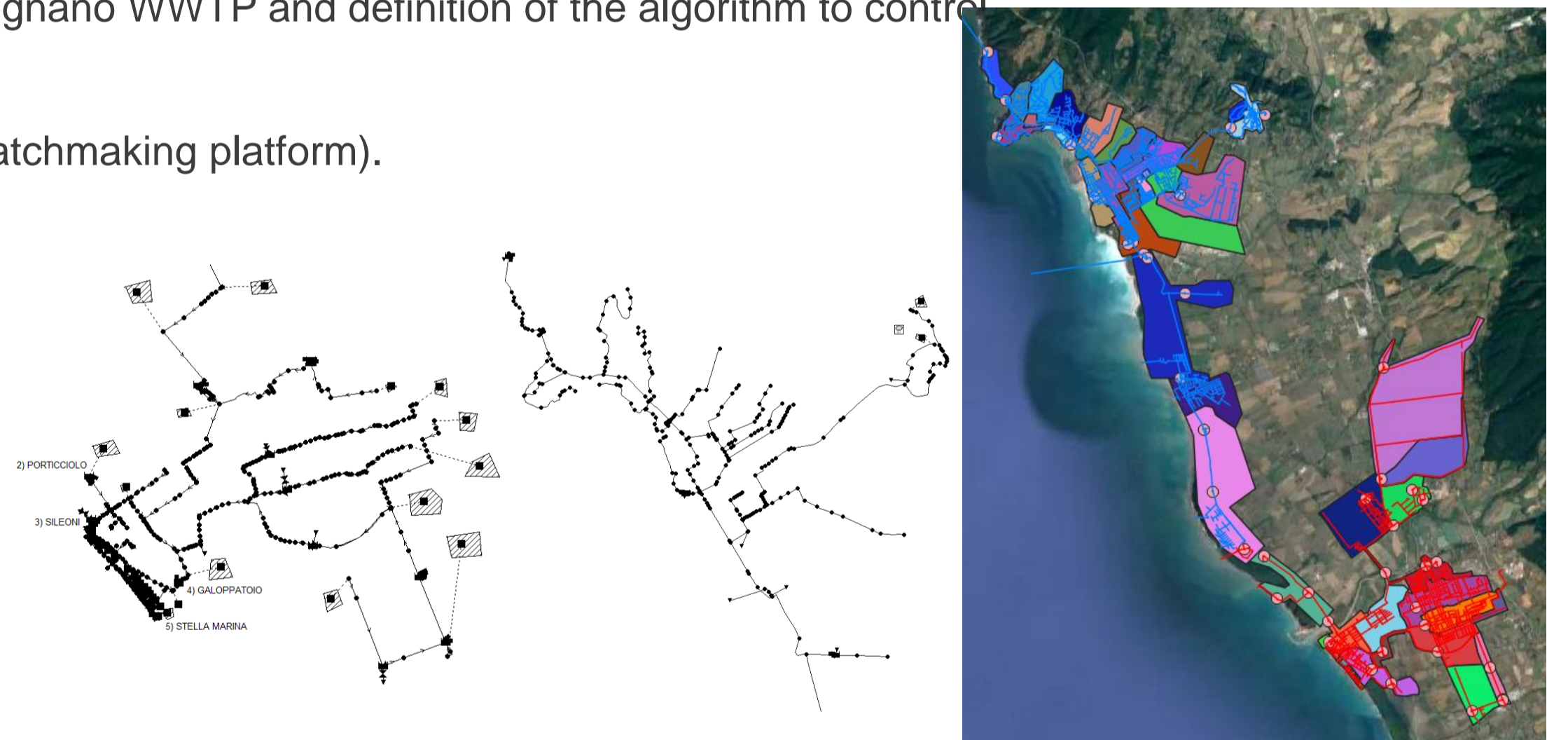
Sewer network modeling and calibration

Lessons learned from monitoring and calibration activities

→ Conductivity in wastewater is reliable low-cost parameter with seasonal variability;

→ The heterogeneous sewer networks complicates probes installation

→ Issues related to sensors' signal transmission in the costal area;

→ Difficulties related to the available data for the sewer models

What is crucial in terms of replication of the technology?

→ Availability and reliability of actual technical information related to the sewer networks (Diameters, slopes, pumping station start/stop levels, overflows geometrical info...)

→ Trained personnel and a maintenance program is needed to monitor sea water intrusion in the sewer networks due to fouling/clogging of sensors and loss in sensitivity and accuracy