xylem
Let's Solve Water

Innovative solutions for Water Losses reduction And Digitalization

Adrian Grama – Project Manager Xylem Romania

We Deliver Innovative Solutions With a Global Impact

100+
years of innovation, leadership, and service to customers with leading brands

$8.1B
2023 revenue*

5,100+
patents and trademarks

>23,000
colleagues with diverse water expertise

350+
locations around the world

~150
countries where Xylem solutions solve water

NYSE: XYL

*combined 2023 pro forma revenue

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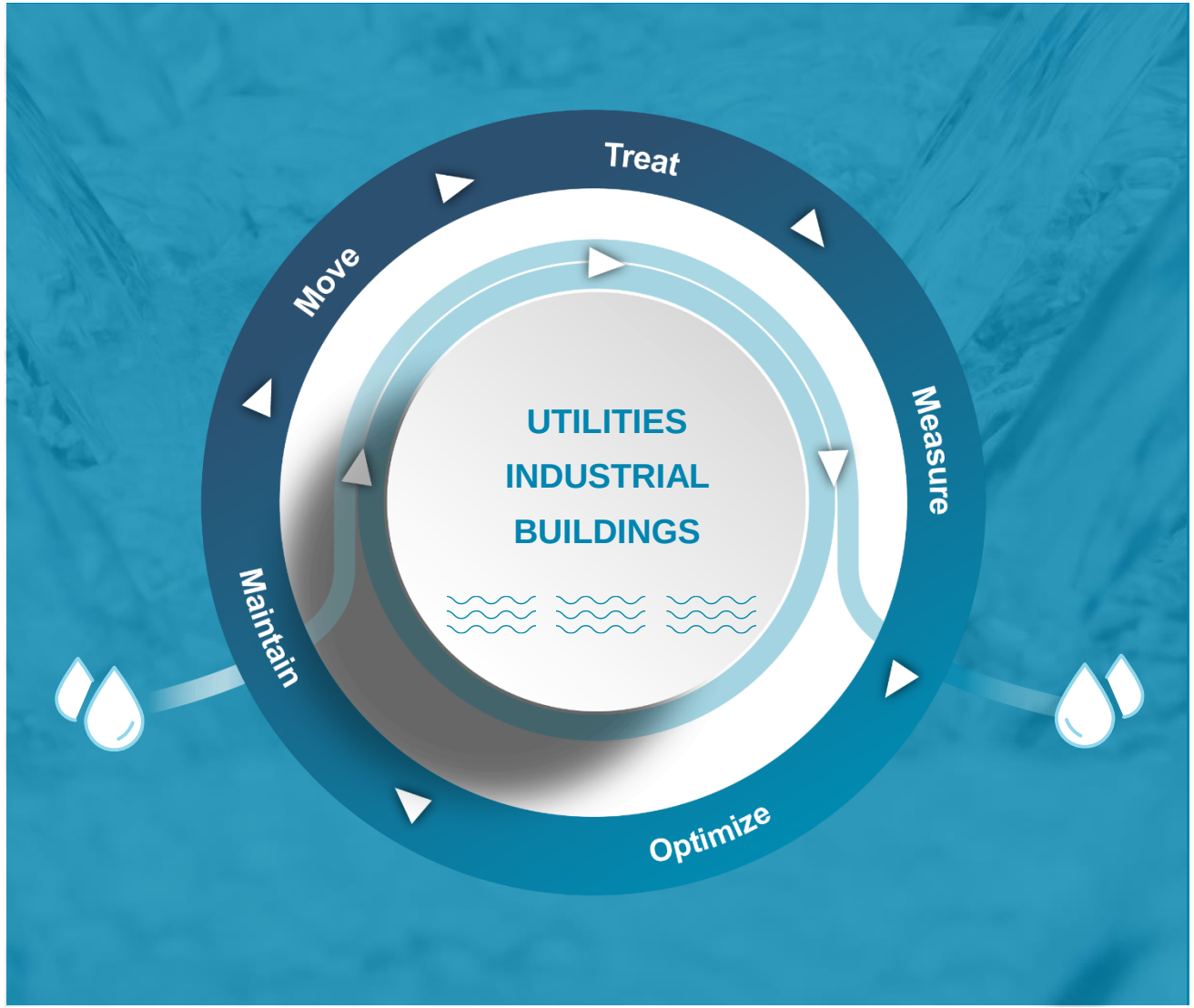
We Support The Lifecycle of Water…



MOVE

Moving water on its entire journey, efficiently and safely.

TREAT

Transforming water quality to meet exacting standards, sustainably.

MEASURE

Sensing, monitoring and measuring what matters to water managers and communities.

OPTIMIZE

Providing insights that optimize water networks and protect water assets.

MAINTAIN

Improving operational performance and delivering precise water outcomes.

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Water losses reduction

- Equipment
- Pipe inspection/assessment

For Non-Revenue Water

Water Distribution

Optimize water pressure

For network pressure boosting

Packaged pumping stations

For water boosting

Multistage pumps

For efficient pump control

Pump monitoring and control

Condition Assessment

Map your water losses

For flow metering in transmission & distribution

Static flow water meter

For leak localization in water main

In-situ leak detection tools

For leak localization in distribution

Sensors and analytic software

Metering and Billing

Try real time metering

For water metering in water network

DMA water meter

For water metering in water network

Static water meter

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Our Pipeline Management Approach

PROACTIVE MANAGEMENT
Protect pipeline forever

PREDICTIVE ANALYTICS
Forecast future condition

ASSESSMENT PLAN
Prioritize pipelines for assessment

PRECISE ASSESSMENT
Understand current condition

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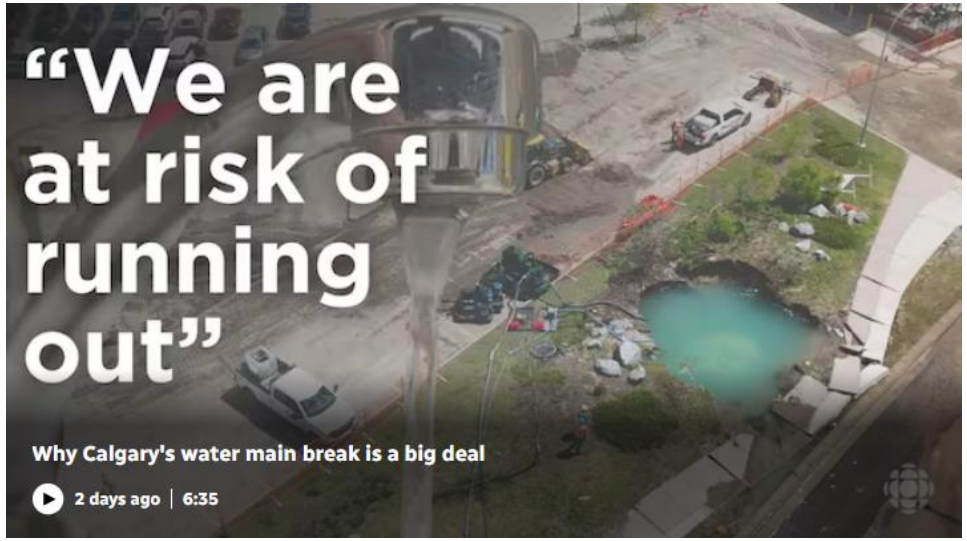
June 5, 2024 – Pre-stressed Concrete Pipe Break in Calgary, Canada

Infrastructure:

- 78” (2.0m) Pre-stressed concrete pipe built over 50 years ago that feeds treatment plant
- Did not perform pipeline assessment or installed acoustic fiber optic monitoring

Impact:

- City is at risk of running out of water in a few days
- Residents (1.3 million people) under mandatory water restrictions and must reduce water usage by 25%
- Boil advisory issued – water must be boiled before being consumed
- Thousands of people still don’t have access to water and emergency water supply being delivered
- Will take days to dewater and repair pipe



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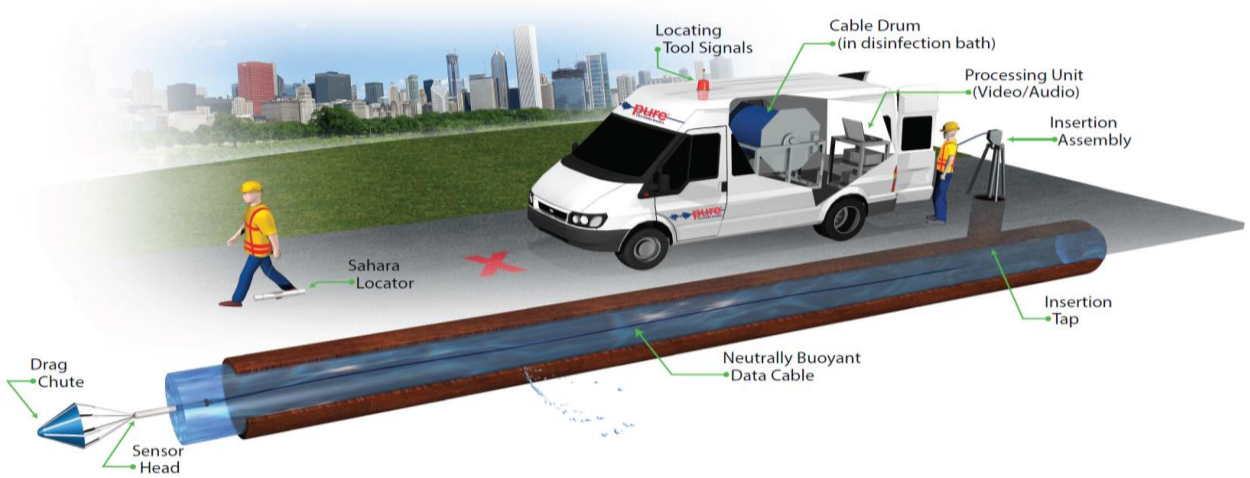
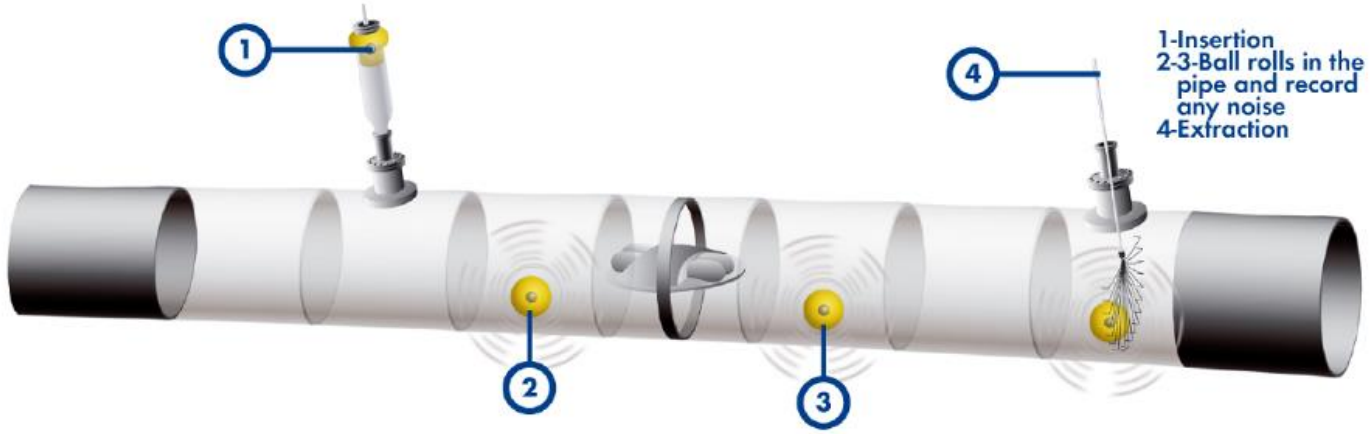
Inline Leak Detection Platforms for Large Diameter Pipes



Sahara® System

- Tethered leak detection with CCTV
- Ideal for complex networks
- Worldwide since 1999



SmartBall® System

- Free swimming system
- Ideal for long transmission mains
- Worldwide since 2005
- First project in Romania: 2023

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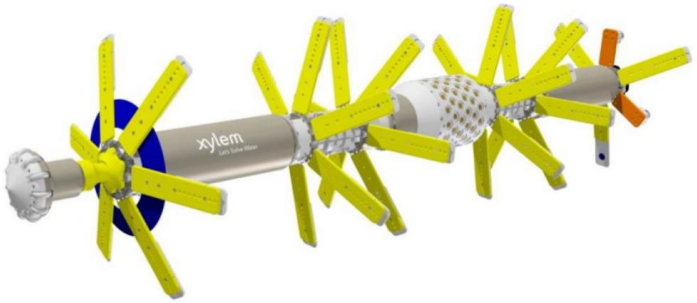
Inline pipe wall condition assesment tools for large diameter pipes



PipeDiver® System

- Free-swimming inline tool
- Minimum disruption to service
- Concrete and metalic pipelines

PipeWalker® System

- Worker operated tool
- Dewatered and depressurized
- Concrete and metalic pipelines

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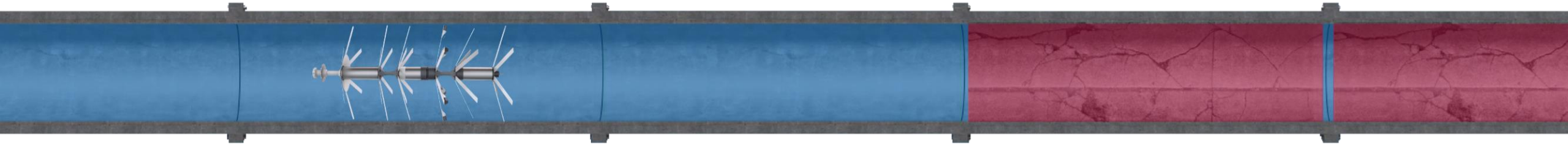
How the PipeDiver Platform Works – Inline Wall Inspection

PipeDiver navigates in-line valves, sharp bends, and tees

Broken bar and wire wraps

Wall loss



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CORDONEL - Innovative ultrasonic water metering

Cordonel can deliver the following benefits to customers across multiple applications:

- The ability to be installed in tight or challenging installation locations (U0D0).
- Cost savings through simplified asset management while maintaining accurate billing across a broad range of applications (R1000 + 12 l/h).
- Pressure and temperature monitoring solution at a fraction of the cost and minimal installation effort.
- High data reliability
- Leakage detection
- Multiple communication options ensure secure data management

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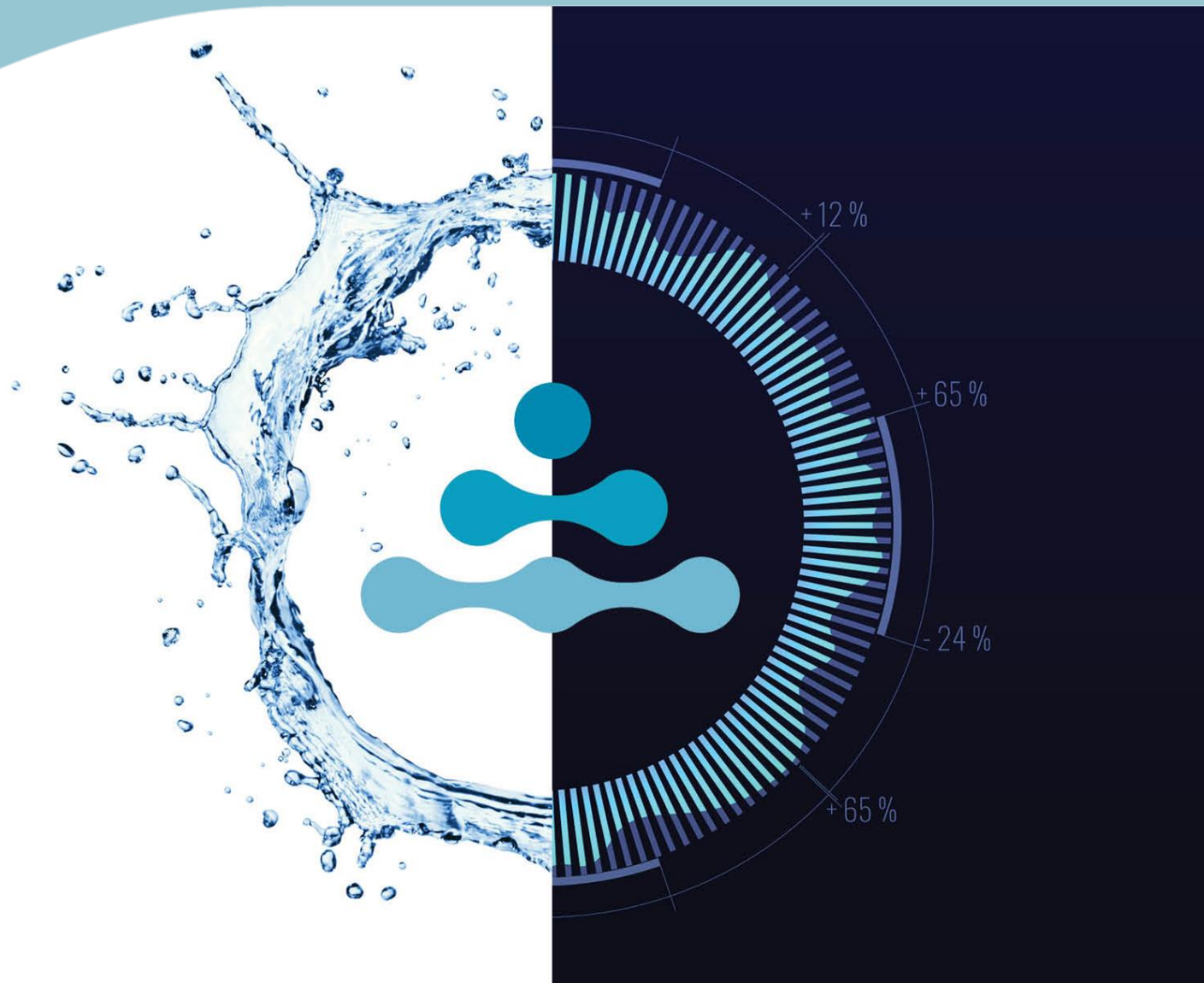

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Digital Platform

From intake to effluent, we can help

Xylem delivers holistic impact to the entire water cycle.

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WATER TREATMENT PLANTS
Make better decisions in real-time and reduce risks of unplanned incidents

WATER DISTRIBUTION SYSTEMS
Manage real losses and gain real-time operational awareness

METERING AND REVENUE
Ensure financial resiliency to keep revenue flowing

COLLECTION SYSTEMS
Detect blocks and forecast flows, prioritize capital improvement plan to ensure reliability and best value for investments

WASTEWATER TREATMENT PLANTS
Reduce costs by optimizing energy and chemical consumption while increasing margins of compliance

WASTEWATER ASSETS
Coordinated control of pump stations, lift stations, tanks, tunnels, high-rate treatment; manage water capacity in real-time leading to optimized capex spend

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2019 IDRICA

2023 xylem vue

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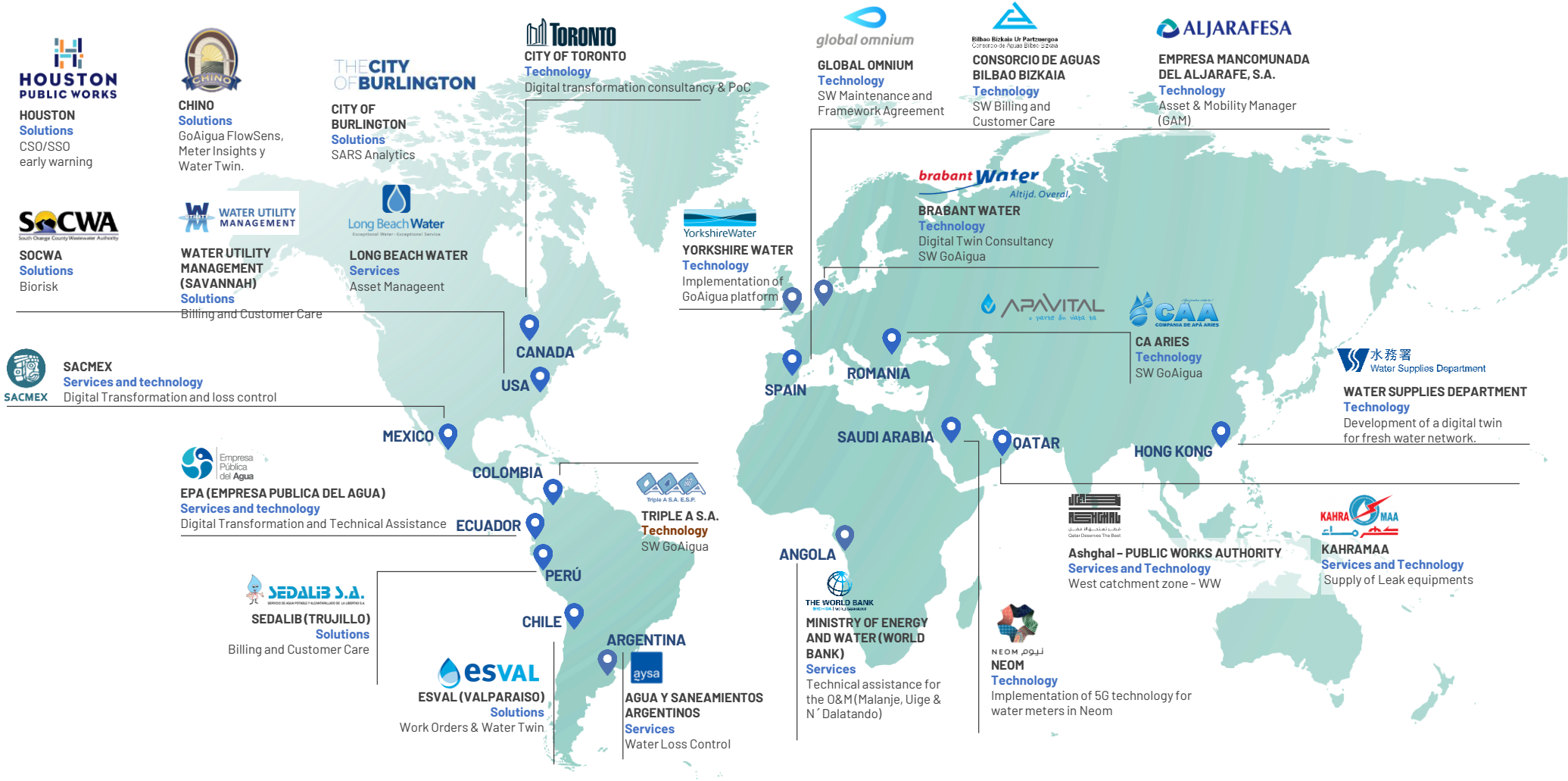

HOUSTON
Solutions
CSO/SSO
early warning

CHINO
Solutions
GoAigua FlowSens,
Meter Insights y
Water Twin.

CITY OF BURLINGTON
Solutions
SARS Analytics

CITY OF TORONTO
Technology
Digital transformation consultancy & PoC

GLOBAL OMNIUM
Technology
SW Maintenance and
Framework Agreement

CONSORCIO DE AGUAS BILBAO BIZKAIA
Technology
SW Billing and
Customer Care

EMPRESA MANCOMUNADA DEL ALJARAFE, S.A.
Technology
Asset & Mobility Manager
(GAM)

SOCWA
Solutions
Biorisk

WATER UTILITY MANAGEMENT (SAVANNAH)
Solutions
Billing and Customer Care

LONG BEACH WATER
Services
Asset Manageent

YORKSHIRE WATER
Technology
Implementation of
GoAigua platform

BRABANT WATER
Technology
Digital Twin Consultancy
SW GoAigua

CA ARIES
Technology
SW GoAigua

SACMEX
Services and technology
Digital Transformation and loss control

WATER SUPPLIES DEPARTMENT
Technology
Development of a digital twin
for fresh water network.

EPA (EMPRESA PUBLICA DEL AGUA)
Services and technology
Digital Transformation and Technical Assistance

TRIPLE A S.A.
Technology
SW GoAigua

Ashghal – PUBLIC WORKS AUTHORITY
Services and Technology
West catchment zone - WW

KAHRAMAA
Services and Technology
Supply of Leak equipments

SEDALIB (TRUJILLO)
Solutions
Billing and Customer Care

ESVAL (VALPARAISO)
Solutions
Work Orders & Water Twin

AGUA Y SANEAMIENTOS ARGENTINOS
Services
Water Loss Control

MINISTRY OF ENERGY AND WATER (WORLD BANK)
Services
Technical assistance for
the O&M (Malanje, Uige &
N´Dalatando)

NEOM
Technology
Implementation of 5G technology for
water meters in Neom

CANADA
USA
MEXICO
COLOMBIA
ECUADOR
PERÚ
CHILE
ARGENTINA
SPAIN
ROMANIA
ANGOLA
SAUDI ARABIA
QATAR
HONG KONG

The Path to Improved Performance Starts from Wherever You Are

Harness data from any source and transform it into useful information for the operation, generating knowledge to optimize decision making along any point in your digital transformation journey.

Physical Assets Sensing

IoT Sensors, ERP, Dataloggers, GIS, SCADA, OPC/PLC, AMI/AMR, CMMS, etc.

Platform & Data Integration

Standardized data

Data QA/QC

Standard time series

Visualization

Real-time data incorporated with GIS

Current conditions

Easy access to data

Analytics

Data science

Custom reporting

Leak detection

Blockage detection through sensor data analysis

Optimization

Overflow prevention

Energy and chemical usage

Combined sewer system operations

Equipment synchronization

Operational Intelligence

Digital twin

Predictive analytics

Real-time simulations

Constant forecasting

Performance

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Xylem Vue powered by GoAigua Architecture

Real-time monitoring and actions on key indicators

SERVICE OPERATIONS CENTER | BI CONNECTORS | DASHBOARDS & REPORTING

Operational Intelligence

Analytics, Optimization and Real-Time Decision Support

- UNIFIED NETWORK MANAGEMENT
- LEAK DETECTION & LOCALIZATION
- METER DATA ANALYTICS
- NETWORK REAL-TIME DECISION SUPPORT
- BIOLOGICAL MONITORING
- FLOOD (SSO) / CSO PREDICTION & PREVENTION
- UNIFIED PLANT MANAGEMENT
- REAL-TIME WHAT-IF SCENARIOS
- CLOG MONITORING
- PLANT REAL-TIME DECISION SUPPORT

Modular Data Applications

DOMAIN MASTER DATA | IoT CORE | DATA SCIENCE FRAMEWORK | GIS FRAMEWORK

Smart Water Engine

AMI/AMR	SENSORS	SCADA, PLCs & IoT Sensors	Distributed DBs	GIS, CMMS
sensus a xylem brand, Itron, Master Meter, Aclara, Badger Meter	YSI a xylem brand, mjk a xylem brand, Syrinix, Trimble, SMARTCOVER	GE, ABB, SIEMENS, Schneider Electric, VTScada	PostgreSQL, MySQL, IBM DB2, MongoDB, Redis, Cassandra, Oracle	esri, Cityworks, IBM maximo

Over 120 protocols/systems supported

Vendor agnostic, integrates with any technology

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World-Class Protection for Your Data, Infrastructure and Consumers

Secured Data Architecture

- NIST CSF Level 3 compliant
- Data segmentation and traceability
- Secured API – no external direct data access
- Encrypted and secure data in transit
- Complies with AWWA cybersecurity recommendation
- Annual third-party internal auditing and penetration testing assessments by internationally recognized firms (available as needed)

Network Configuration

- Cloud-based solution hosted in Tier 1 platforms (AWS, Microsoft AZURE,…)
- WAF cloud access provides protection against cyber attacks
- Secure network access using IP filtering and VPN-IPSec
- Configured web application firewall

Secured User Access

- Microsoft AZURE active directory integration
- OpenID connect identity layer (based on OpenID 2.0)
- Two Factor Authentication (2FA)
- Session time expiration
- Full access audit

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Applications for Clean Water

Technological solutions to optimize catchment, purification, water distribution and commercial water cycle processes.

Unified System Management

Unified Network Management: system-wide vision of the company's operational situation through the integration of decentralized data and advanced algorithms for decision making in water distribution networks.

Unified Plant Management: global vision of the company's operational situation through the integration of decentralized data and advanced algorithms for decision making in water treatment plants. Applicable to one or multiple plants.

Water Loss Management

Leak Detection: detection and categorization of water losses including visualization of key indicators in real time, including DMAs and virtual DMAs.

Leak Localization: investigate anomalies and alarms from acoustic and transient sensors to more accurately identify the location of potential leaks.

Smart Metering

Meter Data Analytics: advanced analytics of information from meters (visual, path and fixed network/IoT).

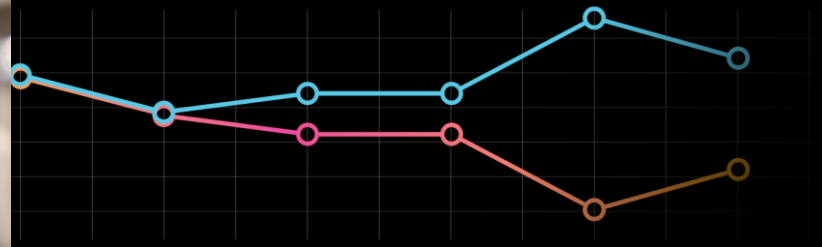
Network Real-Time Decision Support

Real-Time What-If Scenarios: digital twin for real-time simulation, smart operations and improved operational decision-making with what-if scenarios.

Network Real-Time Decision Support: integration of historical and real-time data (including sensors, hydraulic modeling, GIS, SCADA, etc.) to predict operating needs and determine corrective actions with special focus on Water Age Prediction, Water Pressure Prediction, and Plant Source Identification.

Planning and investment

PipePlanner:
DSS to optimize decision making and follow-up of infrastructure renovation plans. From a risk analysis approach, provides renovation programs to maximize the impact of investment plans.



Applications not available in all regions, inquire with your Xylem representative.

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Applications for Wastewater

Optimization of wastewater treatment plants and sewage and stormwater networks to prevent events and automate processes.

Unified System Management

Unified Network Management: system-wide vision of the company's operational situation through the integration of decentralized data and advanced algorithms for decision making in sewer networks.

Unified Plant Management: global vision of the company's operational situation through the integration of decentralized data and advanced algorithms for decision making in wastewater treatment plants. Applicable to one or multiple plants.

Event Detection

Flood (SSO) / CSO Prediction: compliment sensor data with additional sources of information, such as river/tide levels, rainfall forecasts, to understand current state of the network and predict the impact of those additional sources of information on the network.

Wastewater Quality

Biological Monitoring: monitoring of the presence of the SAR/S-COV-2 virus in the wastewater network under centralized management of the whole process.

Asset Management

Clog Monitoring: optimizes the cleaning of sewer networks to avoid clogging overflow events (SSO) using information from sensors, historical data and mathematical modelling.

Network Real-Time Decision Support

Flood (SSO) / CSO Prevention: leverage of current or expected state the network to compute near optimum control scenario that would prevent impact at SSO/CSO locations.

Real-Time What-If Scenarios: digital twin for real-time simulation, smart operations and improved operational decision-making with what-if scenarios.

Plant Real-time Decision Support

Plant Real-Time Decision Support: real-time digital monitoring and optimized modeling which simulates treatment processes and enhance plant control in order to reduce energy consumption/costs or dosing while meeting the effluent thresholds.

Applications not available in all regions, inquire with your Xylem representative.

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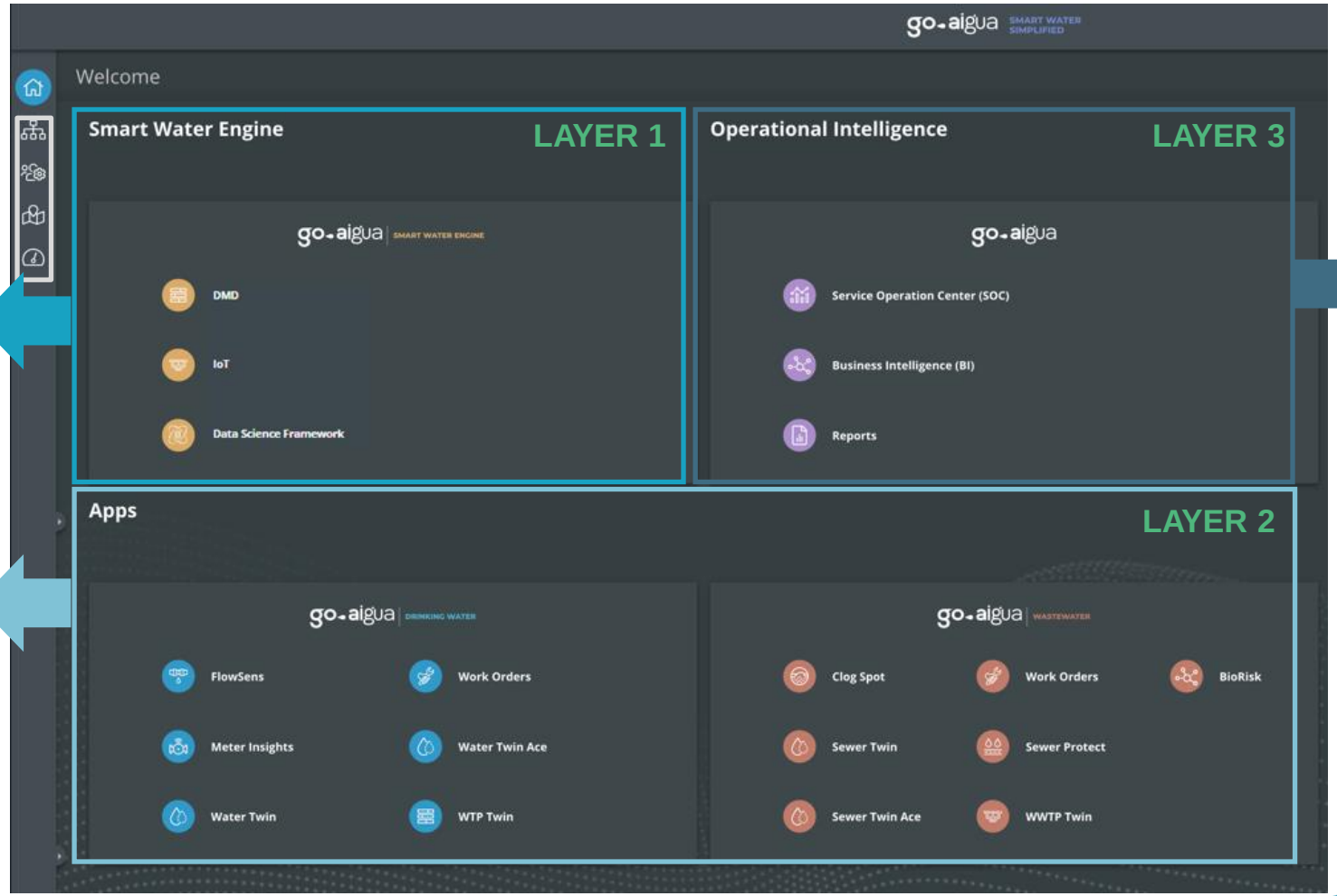
3 Layer Management Model: Smart Water Engine + Applications + Operational Intelligence

Smart Water Engine
- Centralized asset inventory (linear & non-linear)
- Integrated IoT Management
- Data Science framework for developers (Jupyter)

Applications
- Water
- Wastewater



Operational Intelligence
- Service Operations Center: Integration of GIS, work orders, real-time SCADA/sensing data
- Interface with Microsoft PowerBI
- Dashboards and reporting

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SMART WATER PLATFORM

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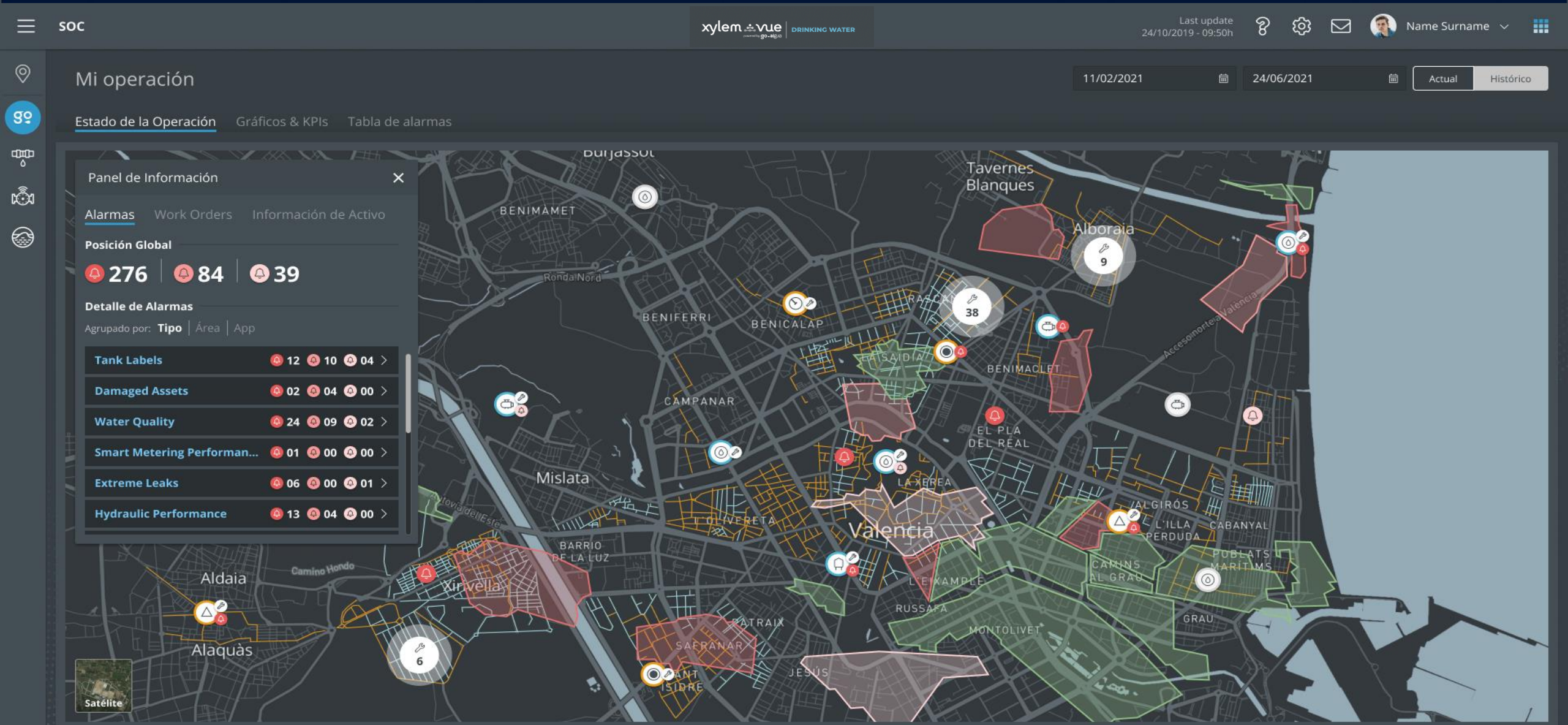
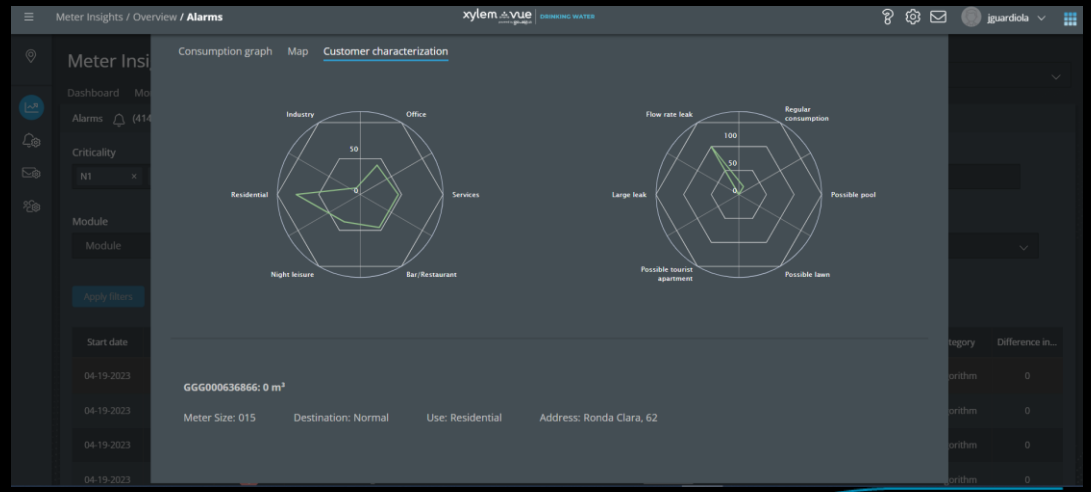


Meter Data Analytics

- Capture, upload and display meter readings and alarms
- Integrate readings from different types of meters
- Monitor water consumption in real-time
- Analyze water consumption by district, service connection and end consumer
- Understand individual consumption patterns and demand forecasting
- Segment customers more accurately
- Optimize commercial losses
- Obtain reports on meter refurbishment plans
- Receive breakdown of information for each counter
- Understand DMA water balances
- Benchmark suppliers



Leak Detection

Problem statement

Without real-time insights into the performance of their water distribution network, utilities are unable to proactively identify and address leakage issues, which ultimately results in lost revenue and a negative impact on customer satisfaction.

What is it?

Leak Detection provides operators with early warnings of invisible leaks, pressure events, fraud, revenue loss, and more by monitoring drinking water distribution networks at different hierarchical levels of sectorization of the same distribution network. This improves the water efficiency of the network by detecting and preventing real or apparent water losses that may affect it, thanks to the visualization of key indicators in real time and the reception of alarms.

Functionality

- Detects and categorizes water losses (according to IWA standard)
- Integrates flow/pressure sensors and AMI data with legacy systems (CMMS, GIS, CIS, etc.) regardless of technology into a single platform
- Estimates hydraulic efficiency of assets without sensors data
- Predicts water injected and consumed in the distribution network
- Automatically generates alarms based on preset user thresholds
- Integrates with GIS framework for map visualization of assets and summarizes key events by typology

Client Value

- Gain more accurate demand forecast
- Optimize the detection-location-repair cycle time
- Prioritize actions with alarms based on volume loss
- Track monthly water balance for customers without remote metering
- Visualize key indicators in real time, including DMAs and virtual DMAs

Primary users

Operators and managers

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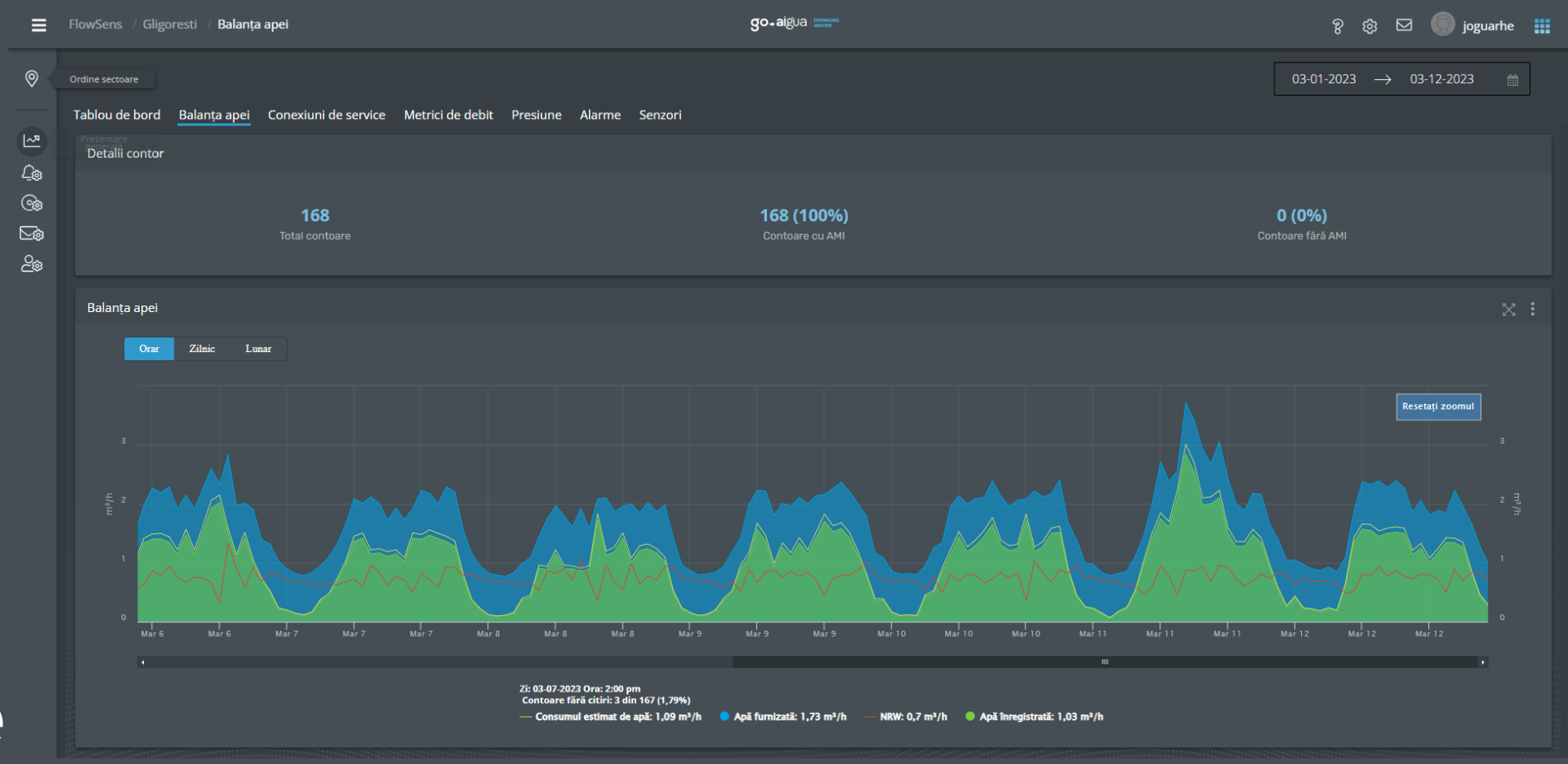
SMART NETWORKS: LEAK DETECTION & LOCALISATION

1. Flow meter
2. Smart meters



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SMART NETWORKS: LEAK DETECTION & LOCALISATION

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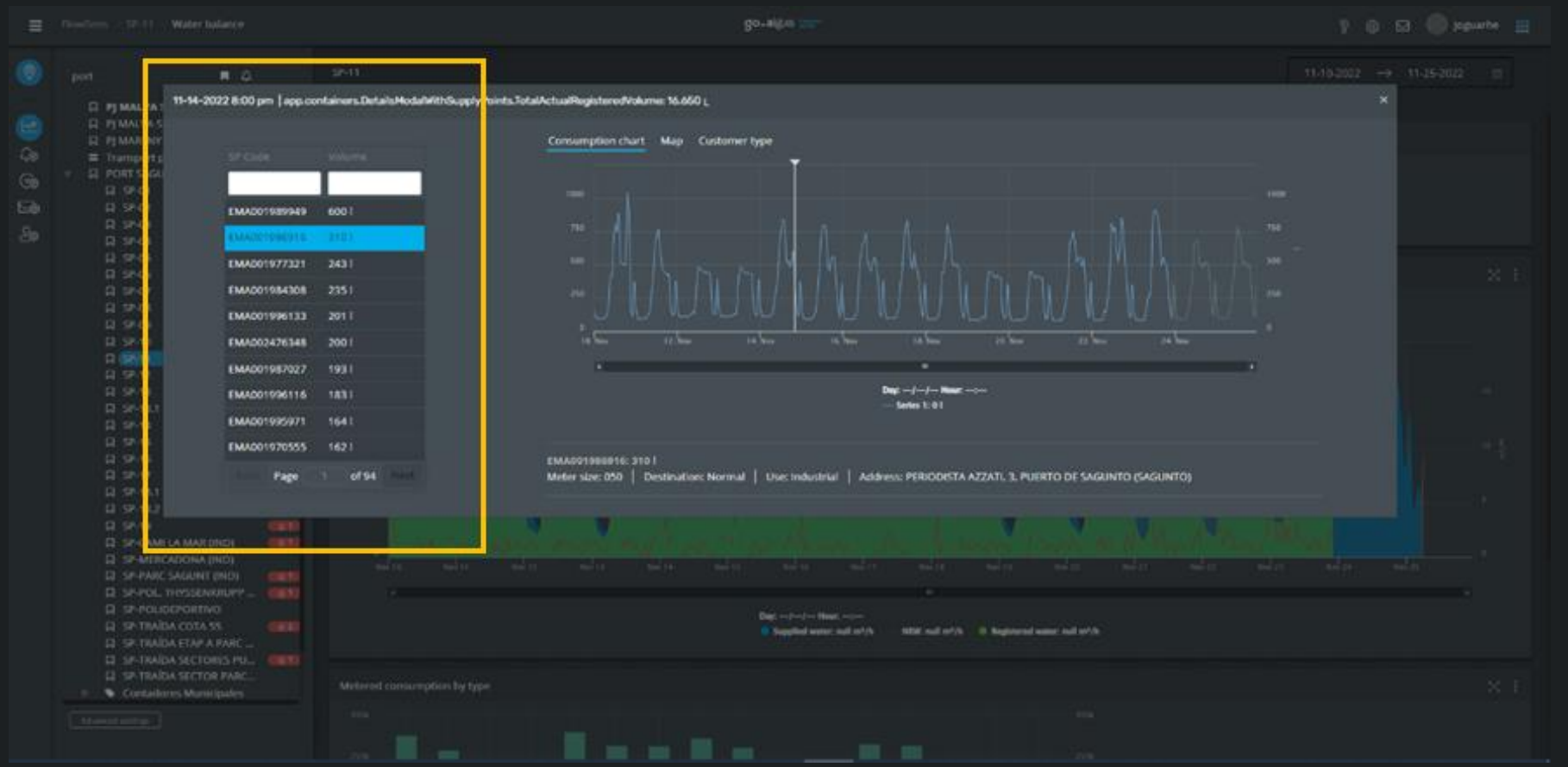

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SMART NETWORKS: LEAK DETECTION & LOCALISATION

The more we measure, the better

1. Flow meter
2. Smart meters
3. Transient, acoustic loggers, etc., for leak location

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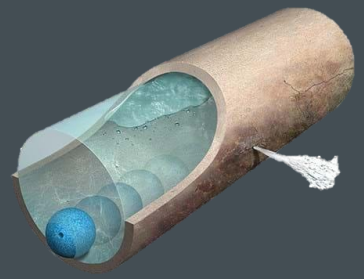
SMART NETWORKS: LEAK DETECTION & LOCALISATION

1. Flow meter
2. Smart meters
3. Transient, acoustic loggers, etc., for leak location
4. Inspection devices



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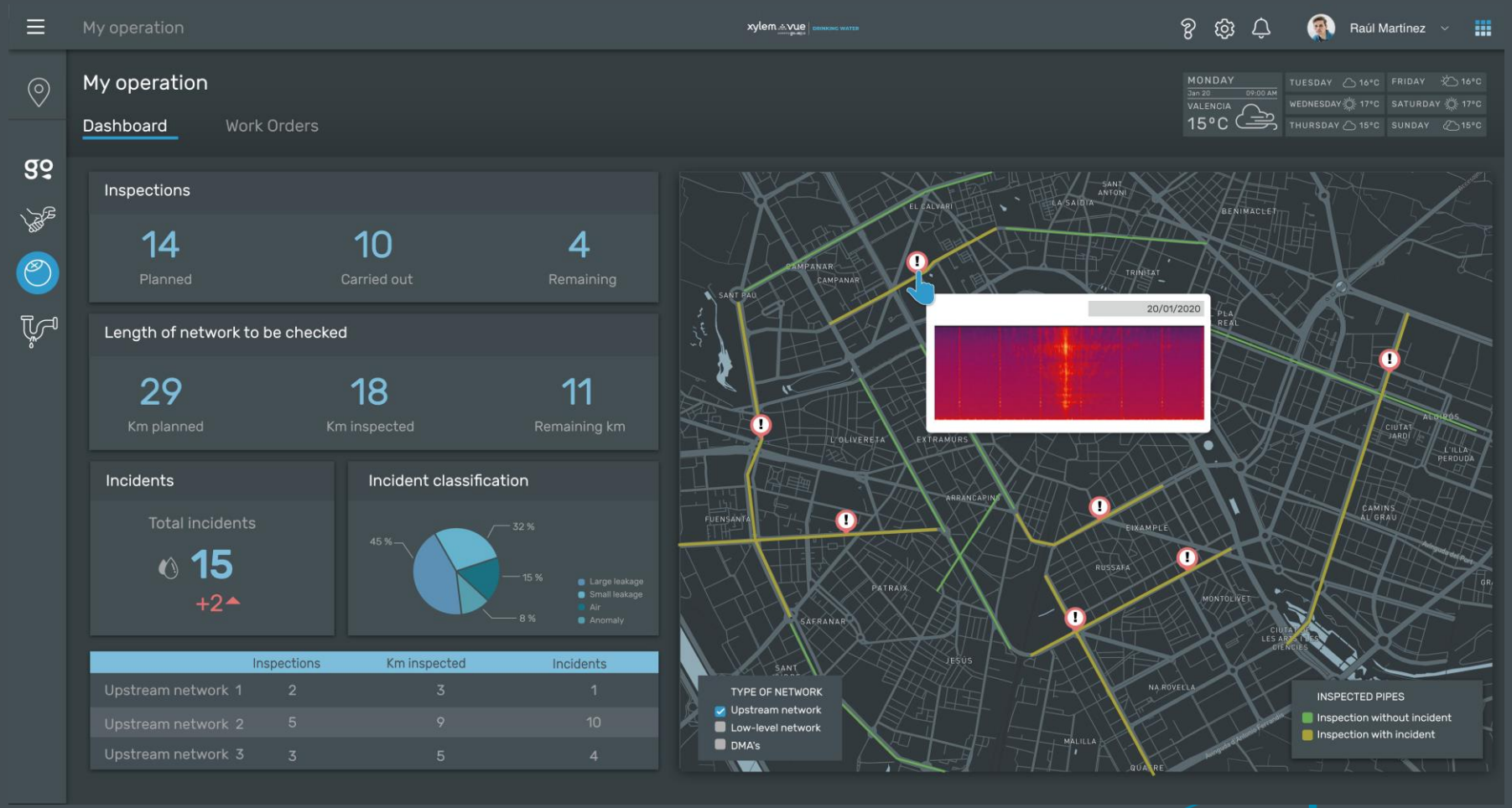

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CAA Aries, Turda (Romania)

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Key Objectives

- Improving NRW operational efficiency
- One platform to manage events
- Full control of the event lifecycle

Benefits

- Centralized event management platform
- AI algorithms for events spatial and temporal association
- Integration of +10 vendors in a single platform

Scale of Operations

22 DMAs	**GIS** Integration	**CMMS** Integration	**Customer Call Center** Integration
+10 Different devices	**+7,000** Smart Meters		

Application Areas

- Unified Network Management
- Leak Detection
- Meter Data Analytics

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APAVITAL S.A, Iaşi (Romania)

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Key Objectives

- Improving NRW operational efficiency
- One platform to manage events
- Full control of the event lifecycle

Benefits

- Centralized event management platform
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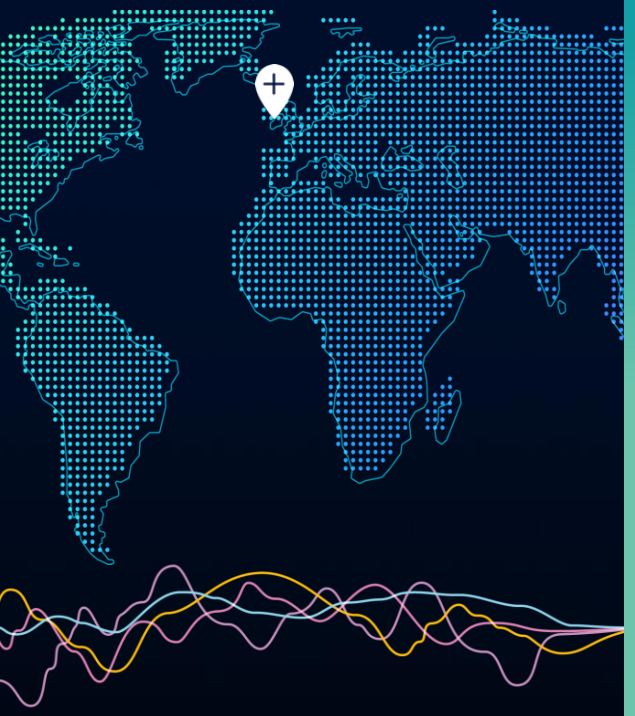

Scale of Operations

100
DMAs

4000 Km
Pipes to be monitored by Pipe Planner

GIS
Integration

70,000
Meters

CMMS
Integration

Customer Call Center
Integration

Application Areas

- Unified Network Management
- Leak Detection
- Meter Data Analytics
- Pipe Planner

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Yorkshire Water, United Kingdom

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Centralized event management solution

Key Objectives

- Improving NRW operational efficiency
- One platform to manage events
- Full control of the event lifecycle

Benefits

- Centralized event management platform
- AI algorithms for events spatial and temporal association
- Integration of +10 vendors in a single platform

Scale of Operations

80
DMAs

+10
Different vendors

GIS
Integration

+15,000
Smart Meters

CMMS
Integration

+2,000
Noise loggers and pressure transient

Customer Call Center
Integration

Application Areas

Unified Network Management

Leak Detection

Meter Data Analytics

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Asset Management

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What is the objective?

To take informed decisions to maximise the impact of maintenance and renovation.

What are the challenges?

Lack of instruments to technically justify investments

Defining a common criteria for decision making

Data availability and accuracy

Trust on digital solutions

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PipePlanner : a data-driven approach to prioritise budget allocations

Technical and scientific literature associates pipe criticality with several parameters, including Pipe age, Material, Traffic load, Nominal pressure, Pressure cycles, Diameter, Depth, Transients, …

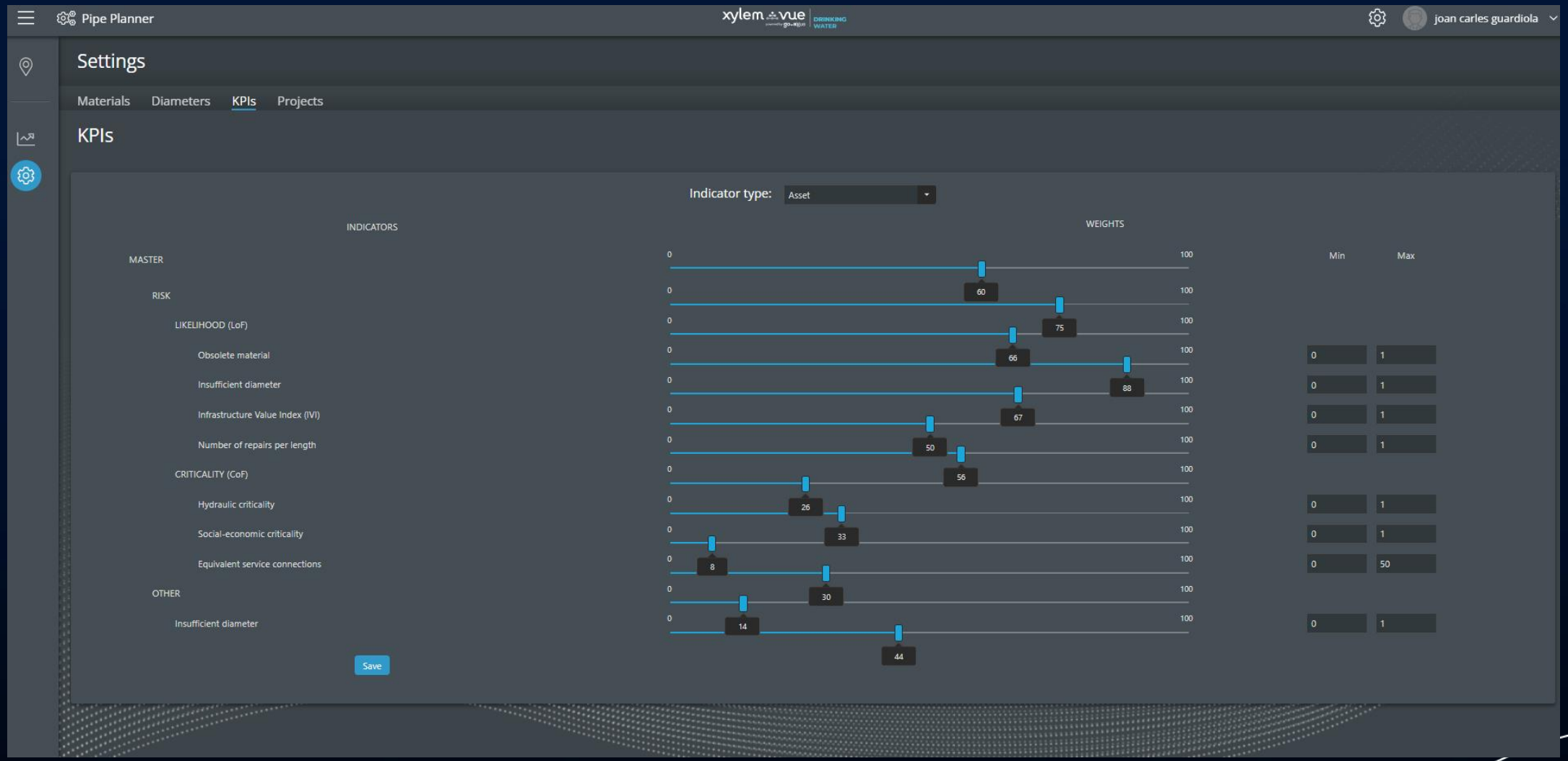
$$Index = I_D W_D + I_R W_R + I_P W_P + I_L W_L + I_C W_C + I_A W_A (I_{\Delta P} W_{\Delta P} + I_T I_{LP} W_{TLP})$$

- Diameter
- Repairs
- Nominal Pressure
- Leakage
- Connections
- Age
- Pressure variations
- Traffic
- Surface type

Main benefits: multi-parameter risk assessment (CoF, LoF), proactive rehab planning : **replace a pipe prior to its rupture** (water loss, continuity of supply, …)

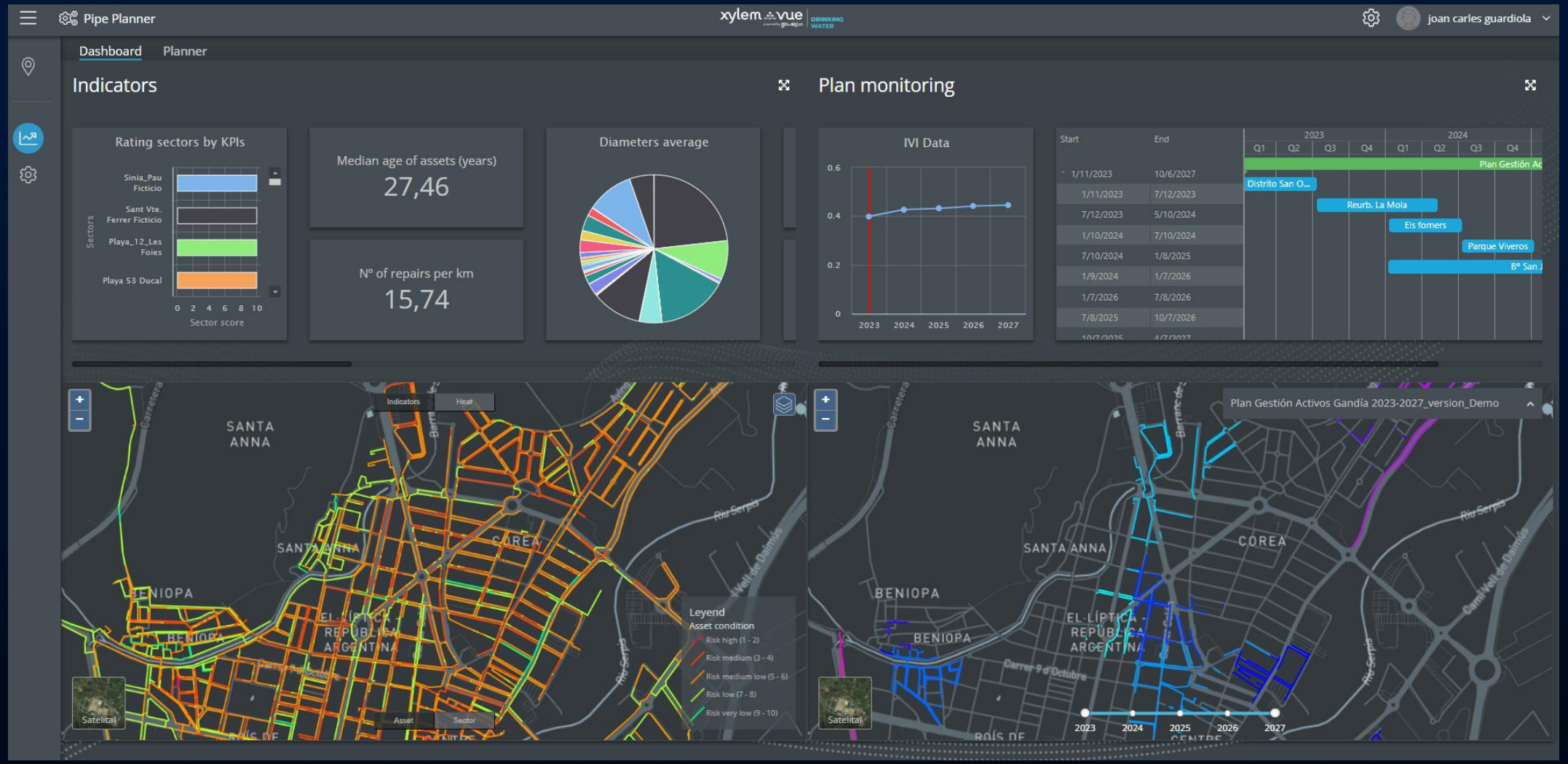
Additional benefits: justifiable and repeatable decisions, less reliance on personnel experience, continuous revision/update as more data becomes available (**PLATFORM**), …

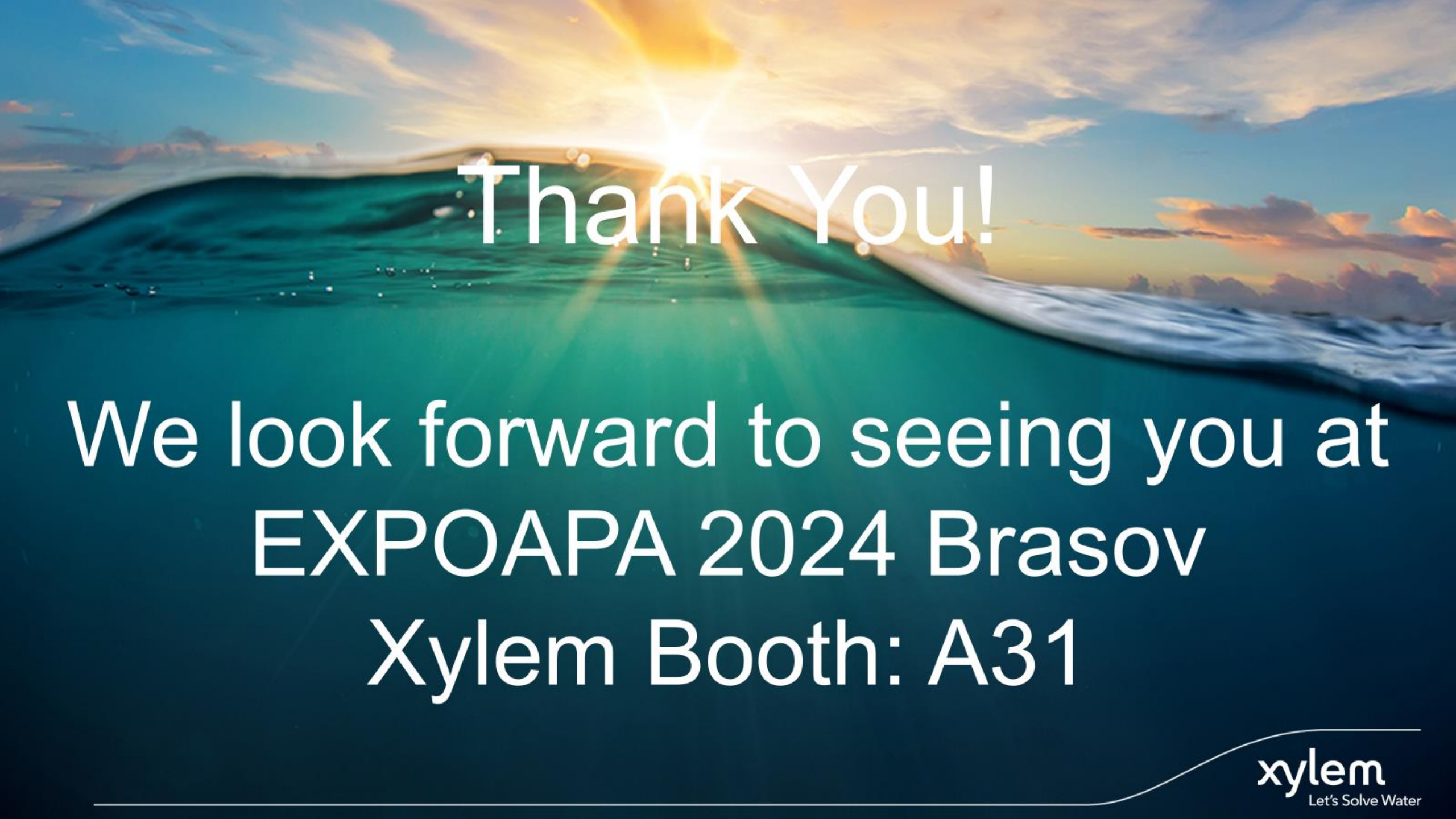
Risk approach



Visualization of KPIs and asset/DMA indicators

DSS for asset condition and renovation plans monitoring




Thank You!
We look forward to seeing you at
EXPOAPA 2024 Brasov
Xylem Booth: A31
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