



DEVELOPMENT AND DEPLOYMENT OF DIGITAL TOOLS TO SUPPORT WATER LOSS REDUCTION IN PORTO

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**2nd LARGEST
CITY IN
PORTUGAL**

**> 500,000
POPULATION
SERVED PER
DAY**

**3rd MOST DENSELY
POPULATED CITY IN
THE COUNTRY**

**FOCUS ON
SUSTAINABILITY
AND
RESILIENCE**

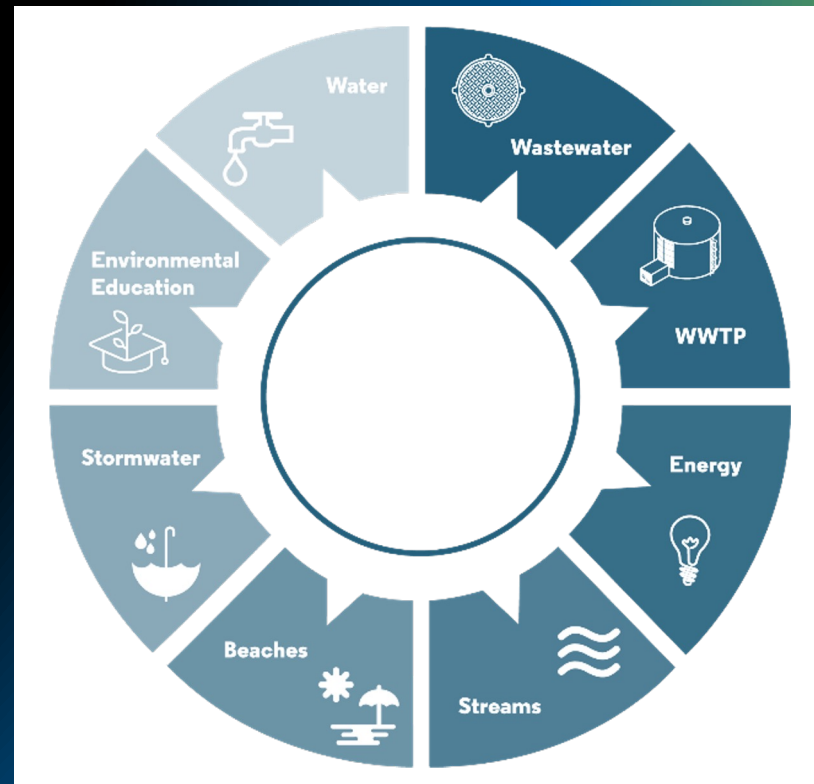




PORTO.
A CITY SHAPED BY WATER

ÁGUAS E ENERGIA DO PORTO

INTEGRATED MANAGEMENT OF URBAN WATER CYCLE AND ENERGY IN A SINGLE UTILITY





Bravura Dam,
Algarve – Portugal
[2024]



Odeleite Dam,
Algarve – Portugal
[2023]



Lisbon, Portugal
[2023]





Valencia, Spain
[2024]



Leiria, Portugal
[2026]



Leiria, Portugal
[2026]



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We Prepare the Future,
Today.

CONTEXT

WATER SUPPLY SYSTEM



170,000
Customers



830 km
Water supply network



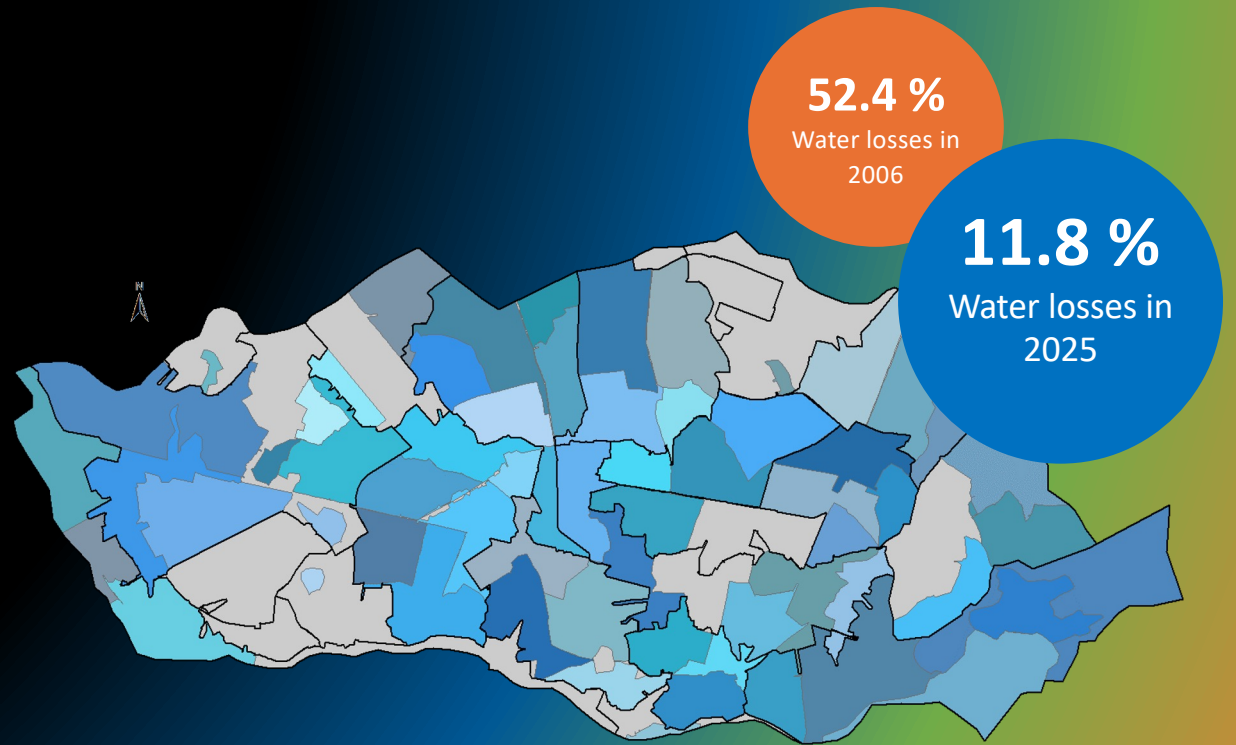
74,000
Service connections



6
Water tanks



63,000 m³
System input volume



Representation of District Metered Areas (DMA)

CONTEXT IN PORTUGAL:

168.5 MILLION m³ OF WATER WASTED PER YEAR
27% OF NON-REVENUE WATER

Source: RASARP 2025, ERSAR

**WHAT IS THE IMPACT OF
WATER LOSSES?**



STRATEGY EVOLUTION ON NRW

REACTION

Action as soon as possible
to resolve major anomalies
in the system



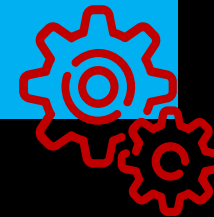
PROJECT “PORTO WITHOUT LOSSES”

Broad action strategies with
a strong focus on the future



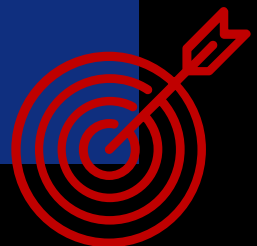
NON-REVENUE WATER REDUCTION PLAN

Broadening the scope of
action and the horizon of
strategies



STRATEGIC PROGRAM FOR MANAGEMENT AND REDUCTION OF NON- REVENUE WATER

Integrated action strategy
extended to all aspects of
NRW, focusing on short and
medium-term objectives



FOCUS



NON-REVENUE WATER MANAGEMENT & REDUCTION PROGRAM

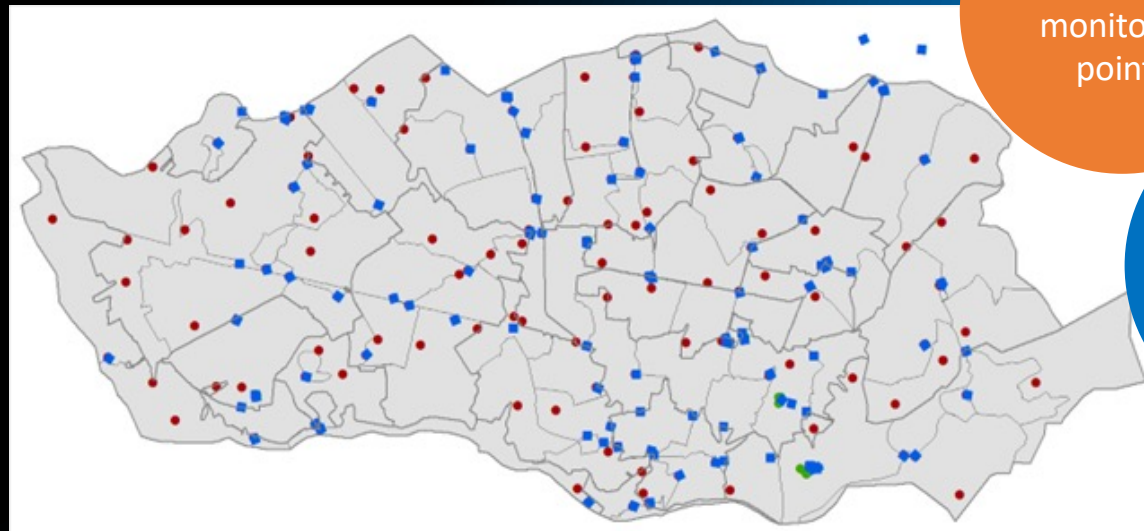


CHALLENGES

REDUCING WATER LOSSES

Effective pressure management in water supply systems is critical to minimizing water losses, optimizing operational efficiency, and extending the lifespan of infrastructure.

DATA
VS
INFORMATION
VS
DECISION



+ 370
monitoring
points

≈ 3 100
network repairs
in 2025

OPPORTUNITY

DIGITAL TOOLS

▲ CIL Pressure

- .Identify the actual pressure level at each customer
- .Pressure optimization



▲ H2Leaks

- .Reduce Active Leakage Control áreas
- .Reduce response time



▲ Repair Leaks ASAP

- .Predict the occurrence of bursts and leaks, and the need to replace pipelines

MONITORING AND PRESSURE CONTROL

CIL Pressure

DATA.

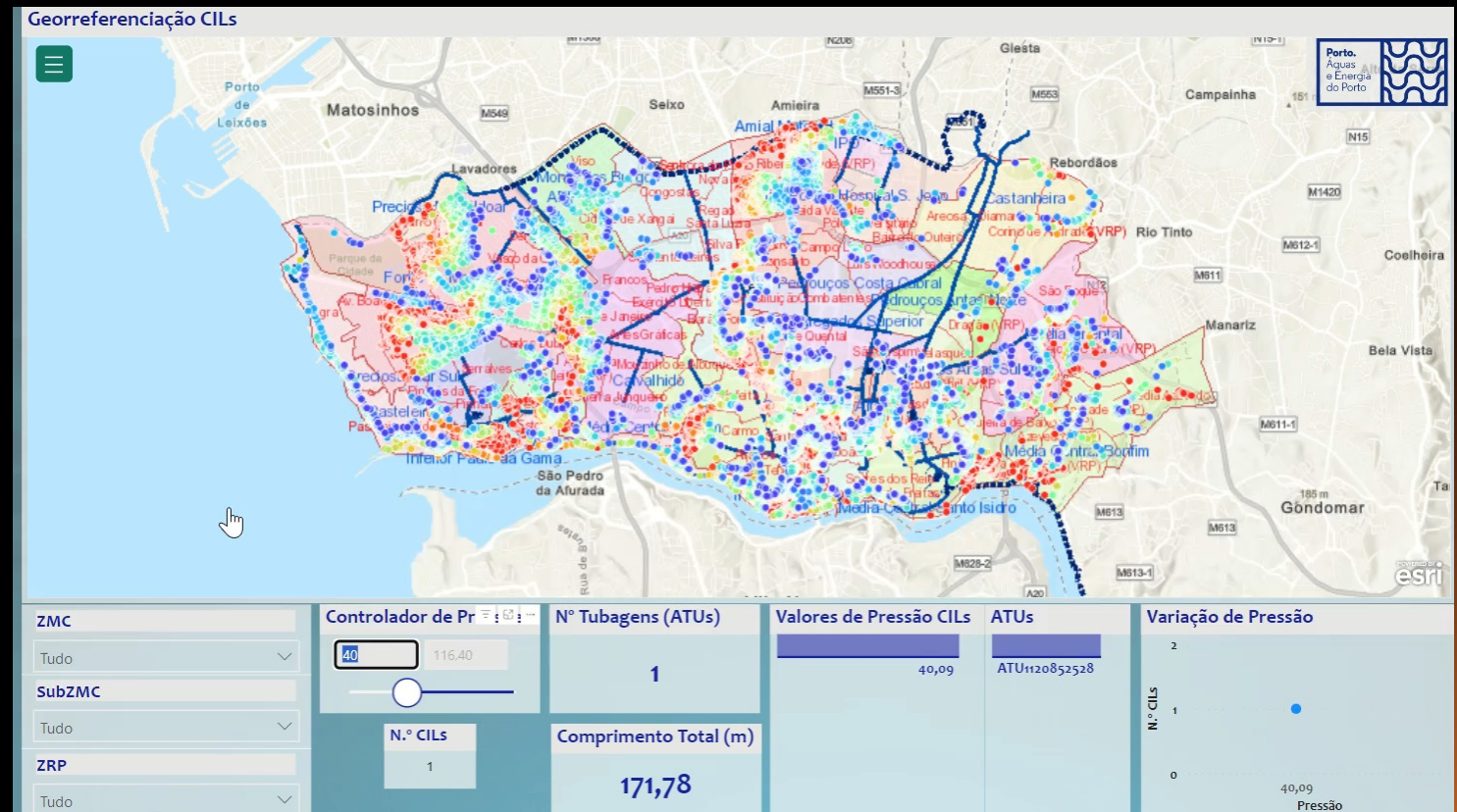
Real-time pressures from over 350 sensors in the supply network

TECHNOLOGY.

Advanced algorithms based on hydraulic formulas

RESULTS.

Actual pressure at each Customer and definition of ideal pressure levels



EFFICIENCY IN LEAK DETECTION

H2Leaks

DATA.

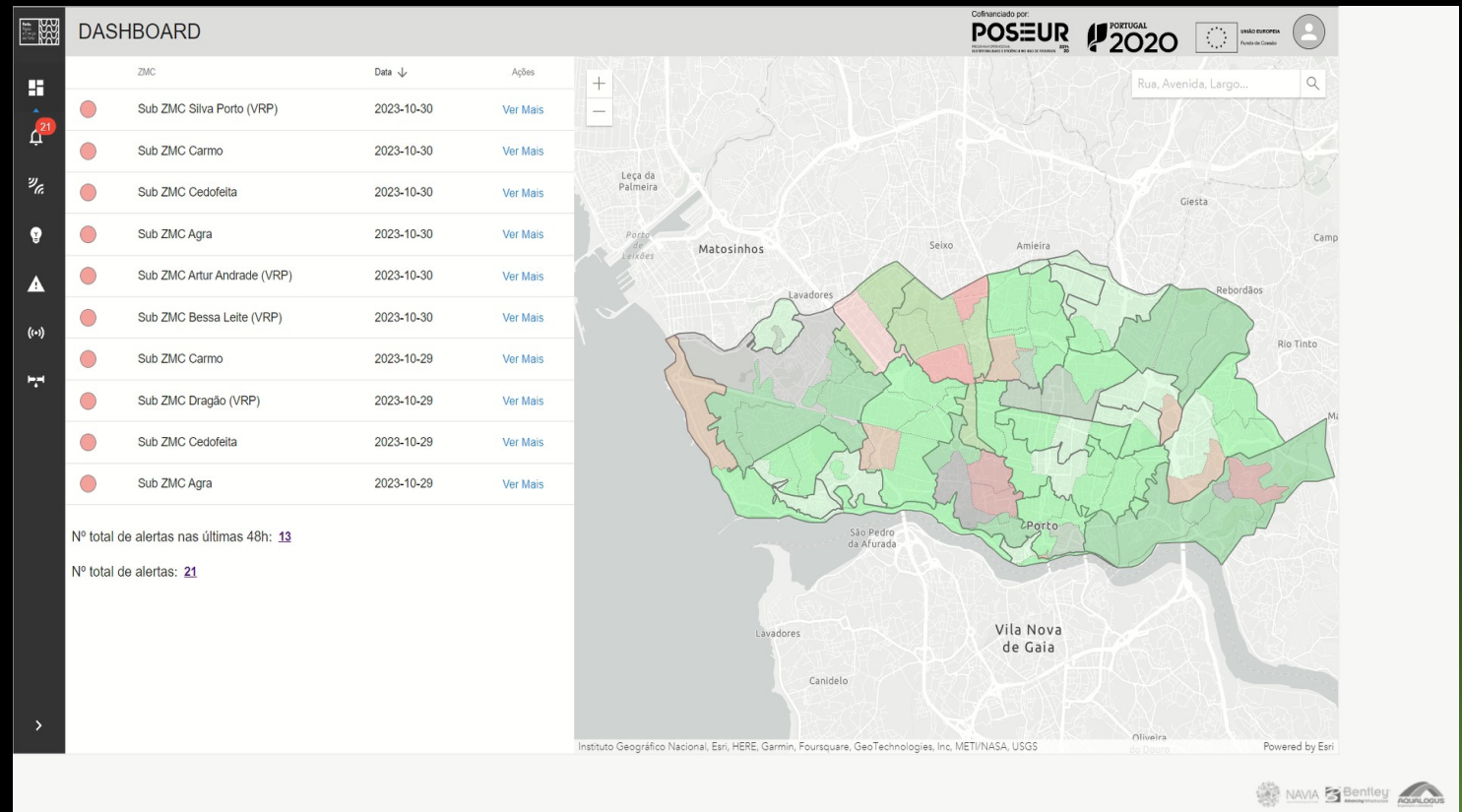
Integration of all internal and external network data in real time

TECHNOLOGY.

Artificial intelligence/
machine learning models with
advanced use of big data

RESULTS.

Alerts for DMAs with the
highest water loss and pipes
with the greatest probability
of failure



PREVENTIVE AND SMART INTERVENTION

Repair Leaks ASAP

DATA.

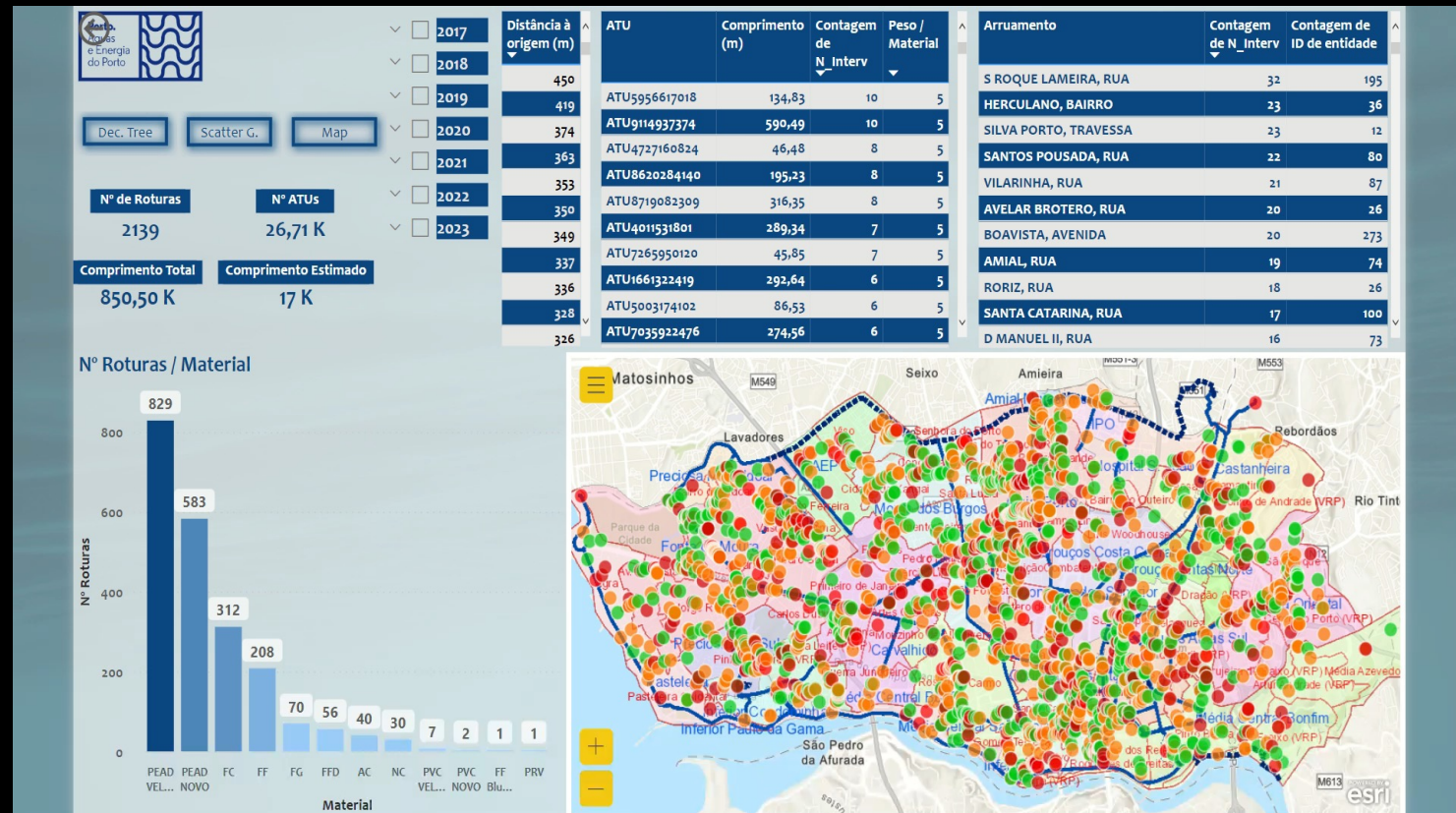
Robust history of repairs and network characteristics

TECHNOLOGY.

Automated integration layers between systems; DaaS – Data as a Service tool

RESULTS.

Identification of “bursts nests” and prioritization of urgent interventions in the network



RESULTS

INCREASE IN WATER EFFICIENCY

CIL Pressure

- .Pressure balancing in each DMA
- .Reduction of overall pressure in the supply system
- .Reduction of infrastructure wear
- .Improved customer service comfort
- .Reduction of water losses and NRW (11.8%)**

H2Leaks

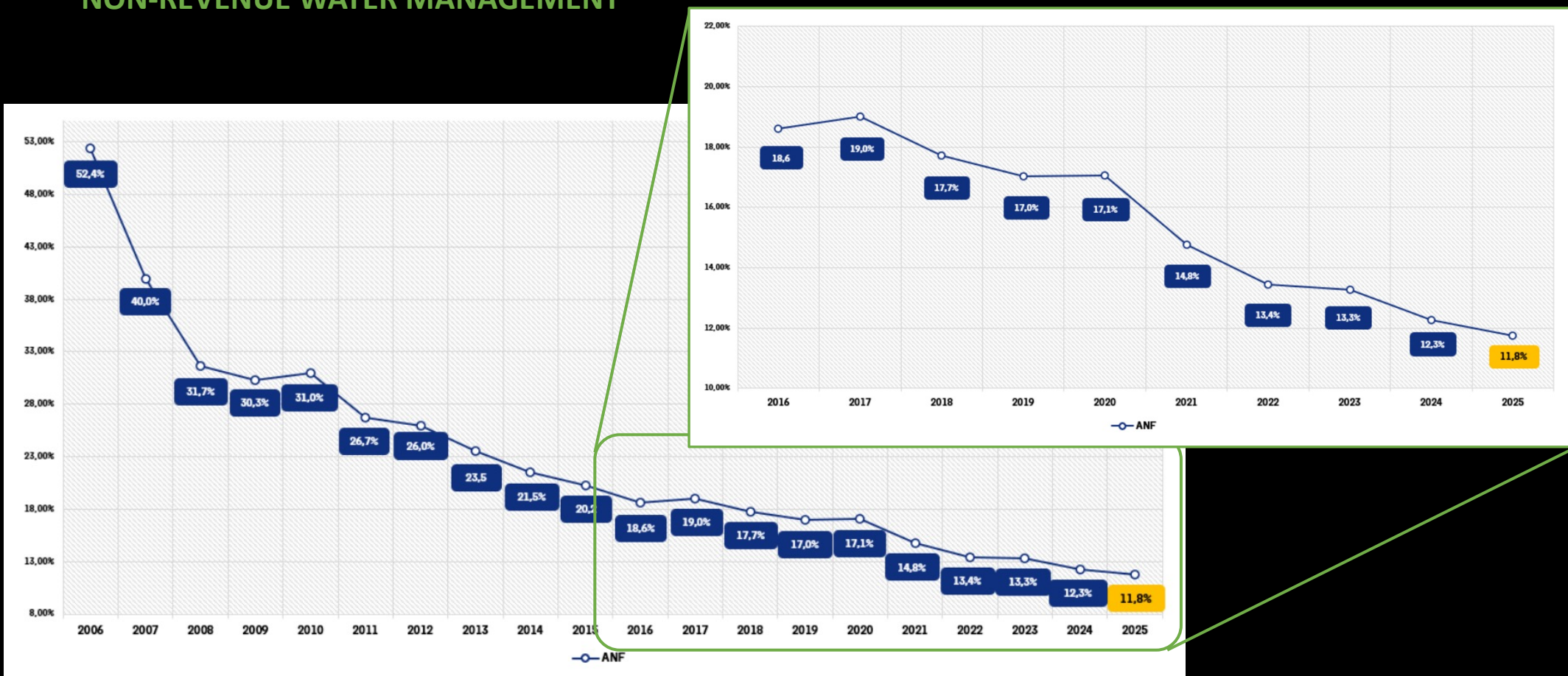
- .Identification of DMA with the highest water loss
- .Pipe classification based on probability of bursts (63% previously identified)
- .Greater precision in leak detection (84% detection and repair within 24h)
- .Optimization of field resources and reduction of operational costs
- .Reduction of water losses and NRW (11.8%)**

Repair Leaks ASAP

- .Identification of “bursts nests” (+20% in 2022 and +25% in 2023, e.g.)
- .Prioritization of urgent interventions in the network
- .Reduction of failures and service optimization for customers
- .Increased infrastructure resilience
- .Smart asset management
- .Reduction of water losses and NRW (11.8%)**

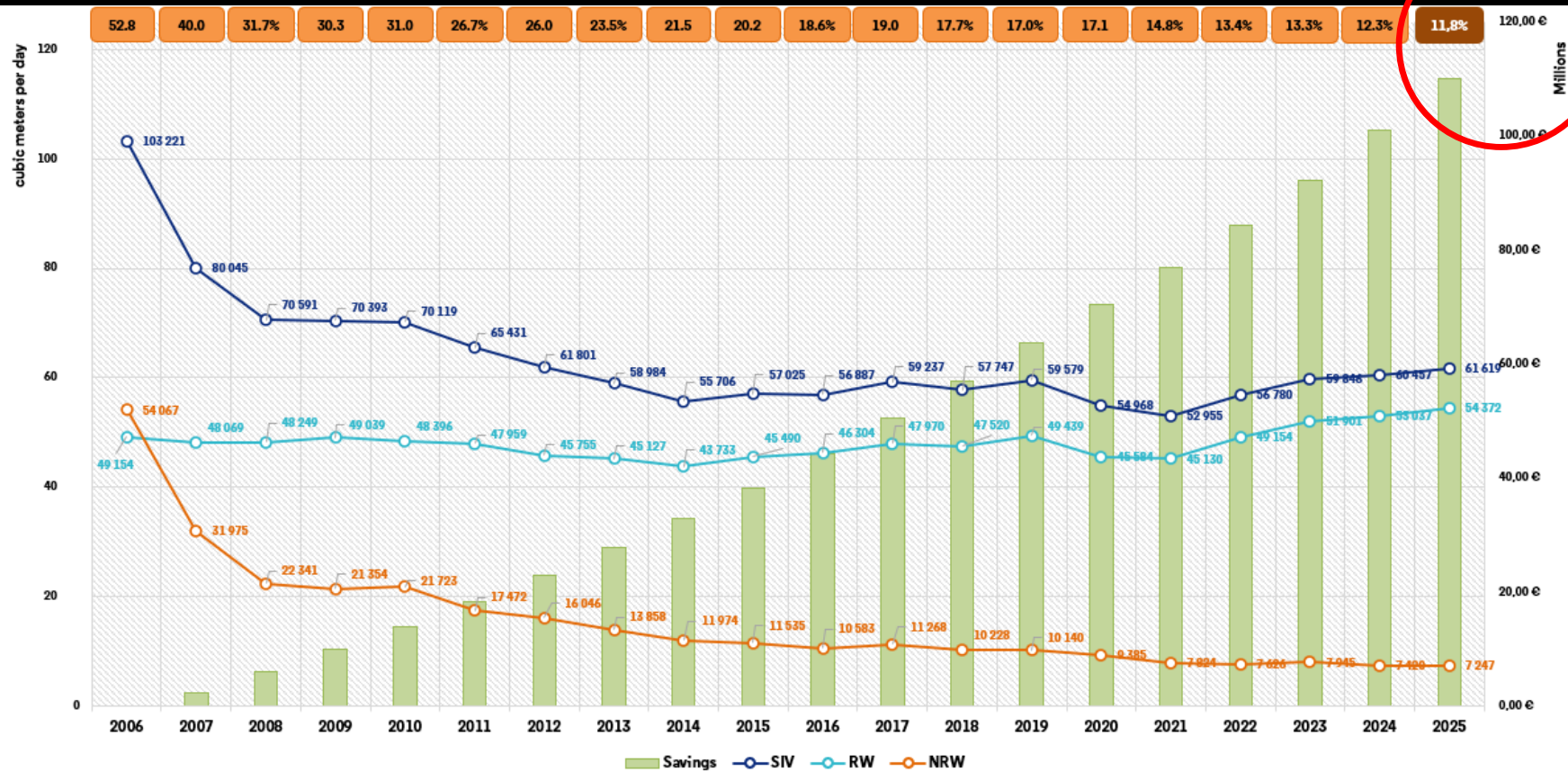
RESULTS

NON-REVENUE WATER MANAGEMENT



RESULTS

NON-REVENUE WATER MANAGEMENT



110 M€ SAVINGS

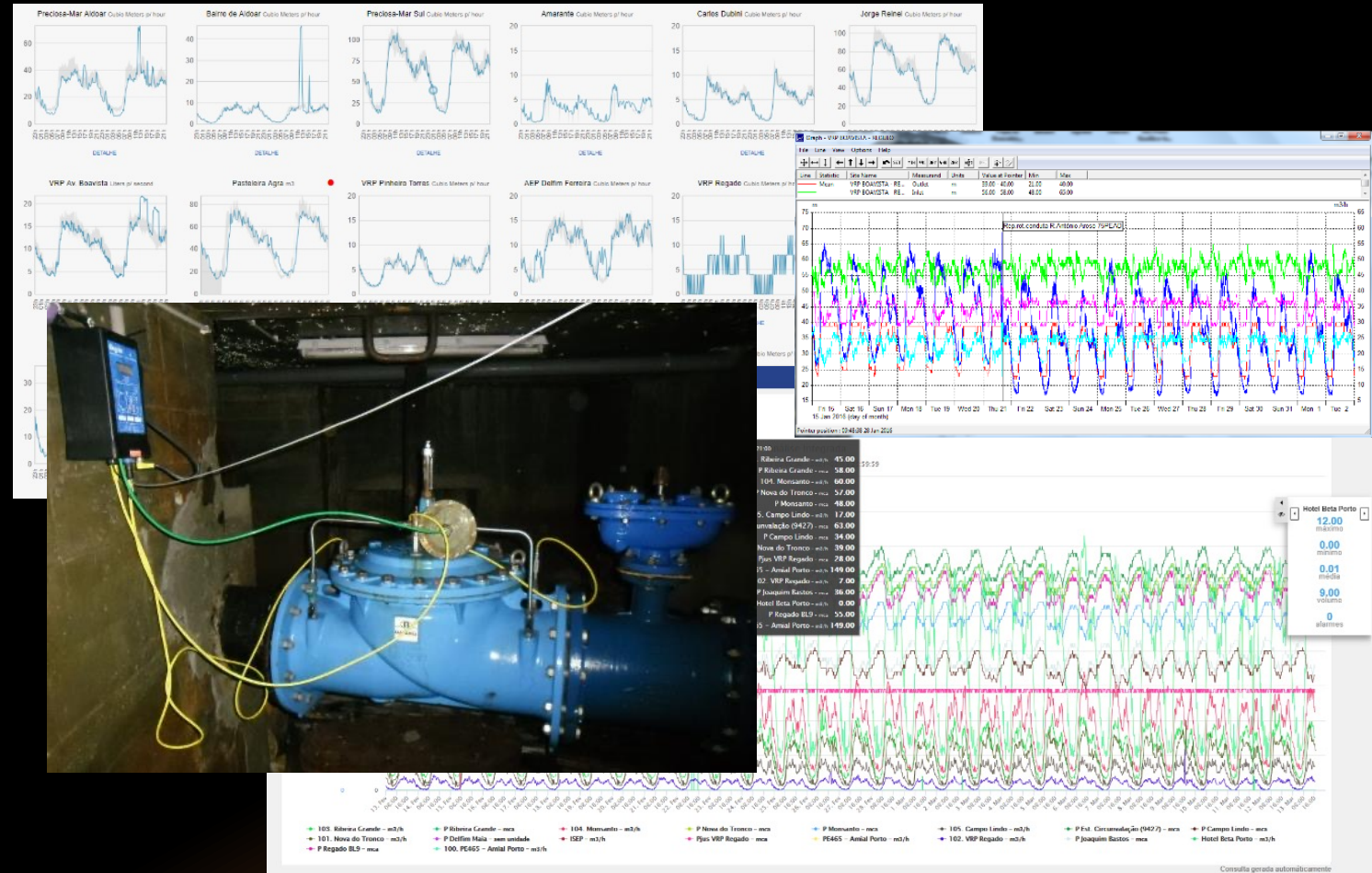


KEY INSIGHTS AND LESSONS

CIL Pressure

- .Detected poorly calibrated equipment.**
- .Became a reference for calibration.**
- .Highlighted the need for accurate data collection.**

**ACCURATE DATA COLLECTION
AND CONTINUOUS
CALIBRATION ENSURE
MONITORING RELIABILITY**



KEY INSIGHTS AND LESSONS

▲ H2Leaks

.Visually identified critical infrastructures.

.Aligned leak detection teams' know-how with model results.

.Enhanced intervention efficiency.

**TRUST AND COLLABORATION
WITH STAKEHOLDERS
STRENGTHENED THE PROJECT**



KEY INSIGHTS AND LESSONS

▲ Repair Leaks ASAP

.Increased staff awareness
of precise data entry.

.Ensured all leak repairs
are correctly logged.

PEOPLE AND DATA
RELIABILITY ARE CRITICAL
FOR SUCCESS

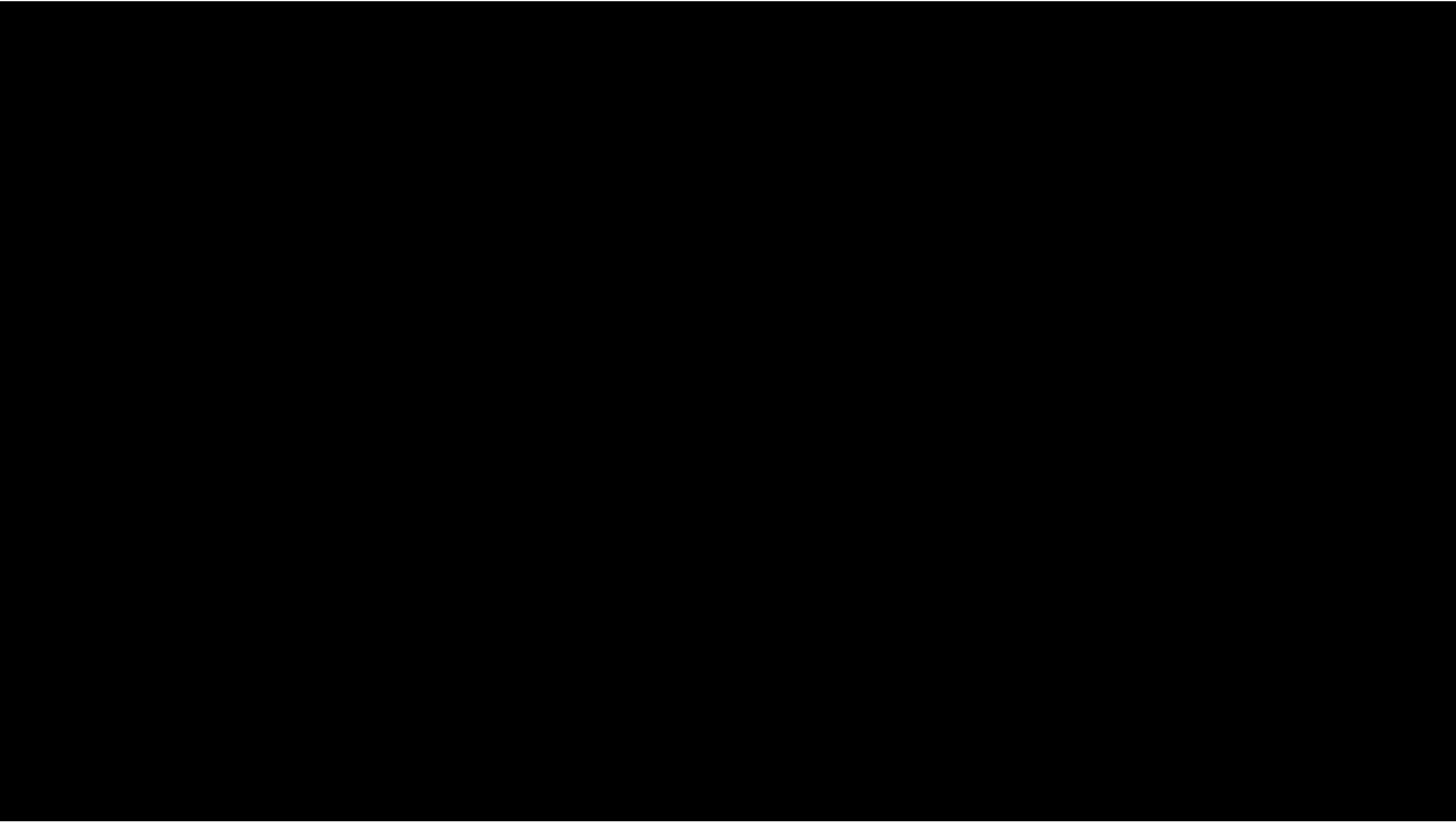




TOOLS IMPROVED EFFICIENCY,
PROCESSES, AND TEAM
MANAGEMENT

HUMAN ELEMENT IS CRUCIAL
TO BOOSTING DATA ACCURACY
AND RELIABILITY

FOSTERED A CULTURE OF
TEAMWORK AND CONTINUOUS
IMPROVEMENT





InnoWave

**WE ARE NOT JUST REDUCING WATER LOSSES, WE ARE TRIGGERING A
TECHNOLOGICAL AND INNOVATIVE WAVE OF WATER EFFICIENCY
AND SUSTAINABILITY.**

THANK YOU.

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