

A person is swinging on a rope over a large body of water. The sun is low on the horizon, creating a bright, shimmering reflection on the water's surface. The person is silhouetted against the bright light. The overall scene is peaceful and serene.

# NRW Performance Improvement Process

27<sup>th</sup> april 2023

# Content

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**Chapter 2** NRW Key-Figures

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01

**AQUAPOR**  
**Group**



# About AQUAPOR

In the market **since 1987**, the **Aquapor Group is one of the main players in the management of municipal concessions** and provision of water supply, wastewater sanitation, collection and treatment of solid urban waste and urban cleaning services

In Portugal, the AQUAPOR Group **is responsible for 12 concessions of water services and sanitation, covering 28 municipalities**, where the service is provided directly to the population. In the provision of services to municipalities and industries, the AQUAPOR Group holds **LUSÁGUA - Serviços Ambientais**, which develops activities from consulting and specialized engineering services to the management, operation and maintenance of urban water systems and treatment facilities.

Its recent acquisition by the **French Group SAUR**, considered the **third largest group** operating in the water sector in France, has reinforced the group's competencies in various segments of activity on a national and international scale.



# About SAUR

## A water pure-player



Founded in  
**1933**

Almost  
**€2 bn revenues**

**12,000**  
employees

**300**  
industrial customers

**4,100**  
production and wastewater  
treatment plants

**20 million**  
residents served worldwide

**706,000,000 m3**  
of drinking water produced in 2020

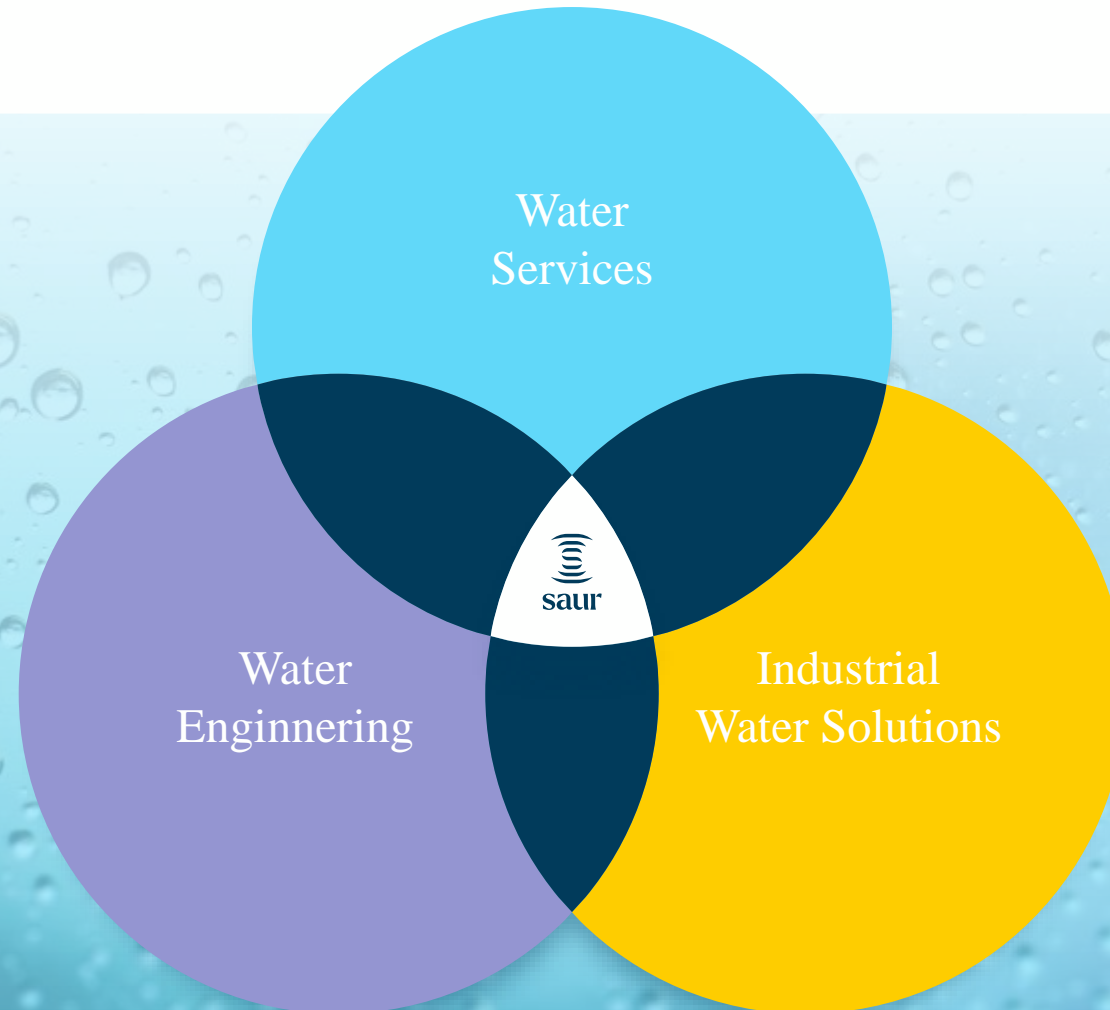
**€32 million**  
invested in digital innovation  
every year

**9,200**  
local authority customers

**250,000 km**  
of drinking water supply systems



# Three core water business divisions



- Engineering, procurement and plant construction.
- Operations support and project management.
- Network services  
Pipeline works: laying and maintenance.

- Technologies, Engineering and Procurement, Installation and Commissioning.
- Consultancy, Services, Remote monitoring, Operations and Maintenance.
- Lease, Build-On-Operate, Build-Operate-Transfer.

- Technologies, Engineering and Procurement, Installation and Commissioning.
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# A global and local company



Eau France

 saur France  cise tp  stereau

Water services International

 aquapor  gestagua

 saur Saudi Arabia  saur Qatar  saur Polska

Industrial Water Solutions

 nijhuis  econvert  unidro

## B2G

Local authorities

Public sector services

Public-private partnerships

## B2C

Customers

## B2B

Industries

# Successful geographical & business diversification



**20 key market positions**  
in Europe, the Middle-East,  
Pacific Asia and America

Commercial presence  
**In 140** countries

Apart from O&M large contracts in Europe, SAUR have Key-Projects focused in NRW Performance Improvement (-50% from status 0 in less than 10 years) in KSA:

- Saur key countries**  
large O&M contracts, Group subsidiaries HQ, permanent offices, etc.
- Saur main sales development (Water Services, Water Engineering, Industrial Water Solutions Divisions)**  
sales network, BUs achievements, industrial subcontractors or end users, etc.

<b>Northwest Cluster</b>	<b>3.2</b> MILLION	<b>11.300</b> KM	<b>269</b> THOUSAND
	Served inhabitants	Networks	Clients
<b>Easter Cluster</b>	<b>5.2</b> MILLION	<b>14.400</b> KM	<b>700</b> THOUSAND
	Served inhabitants	Networks	Clients
<b>Masa</b>	<b>2.500</b> KM	<b>46</b> THOUSAND	
	Networks	Clients	

\*Saur is aligned with international sanctions: only essential activities remain when not in breach.





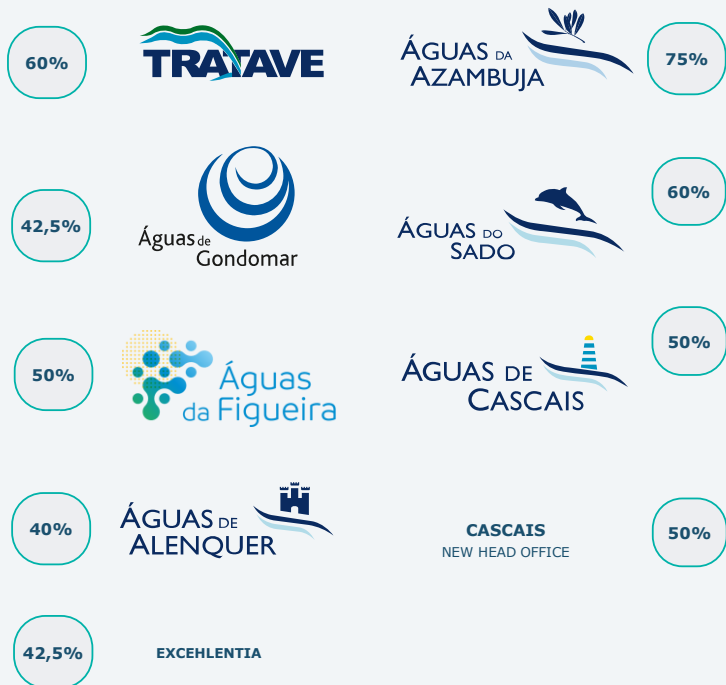
# AQUAPOR

## Group Geographical dispersion

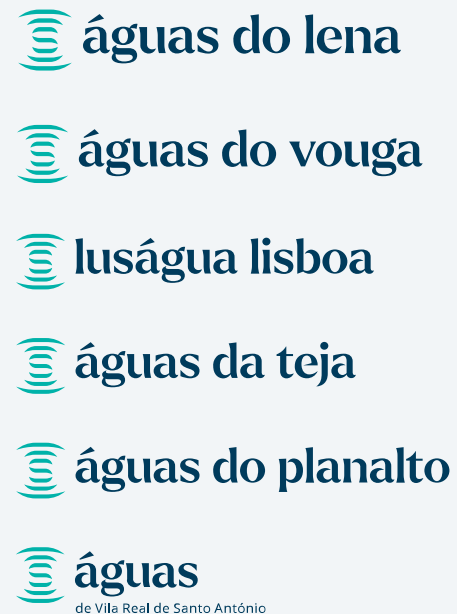


# AQUAPOR Subsidiaries

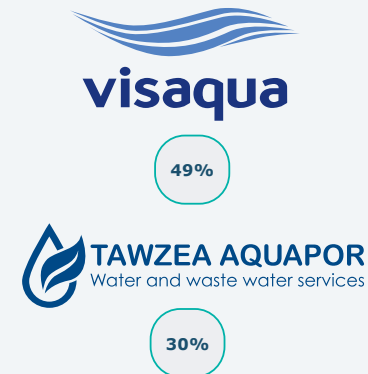
## management



## 100%



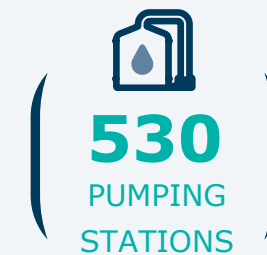
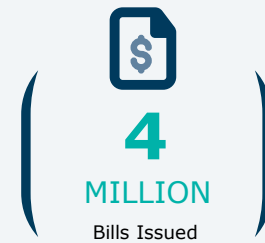
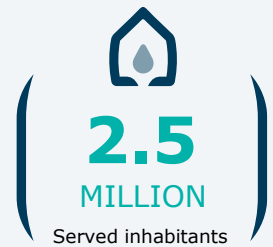
## international



## services



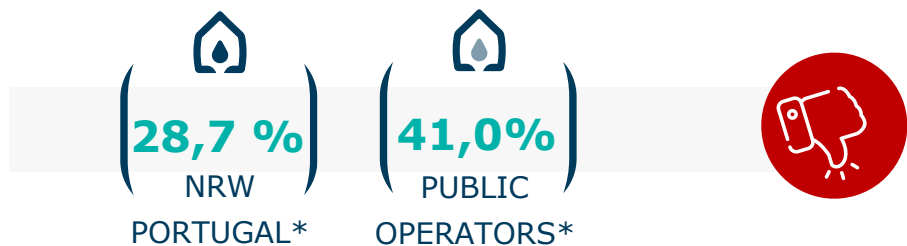
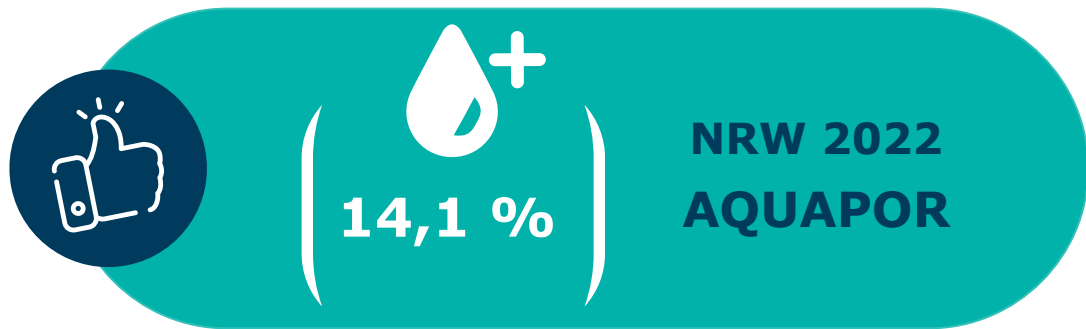
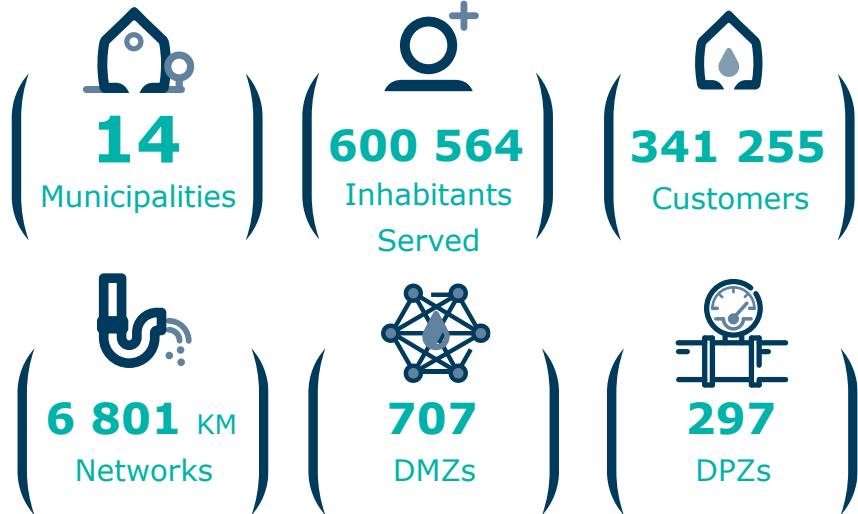
# Main Figures



02

# NRW Key-Figures





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\* ERSAR Report 2021

águas do lena

águas da teja

luságua lisboa

águas do planalto

águas  
de Vila Real de Santo António

ÁGUAS DE  
ALENQUER

ÁGUAS DA  
AZAMBUJA

ÁGUAS DE  
CASCAIS

Águas  
da Figueira

Águas de  
Gondomar



aquapor

# Aquapor's Positioning in NRW Performance (PT)



ERSAR Report 2021



03

**NRW  
Performance  
Improvement  
Process**



# NRW Reduction and Control Process: Main Pillars



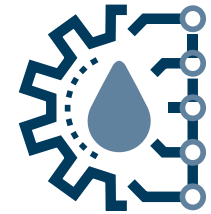
1

**DEFINITION AND  
IMPLEMENTATION OF  
PROCESSES AND PROCEDURES  
FOCUSED ON EFFICIENCY  
IMPROVEMENT**



2

**COMMITTED AND  
FOCUSED TEAM**



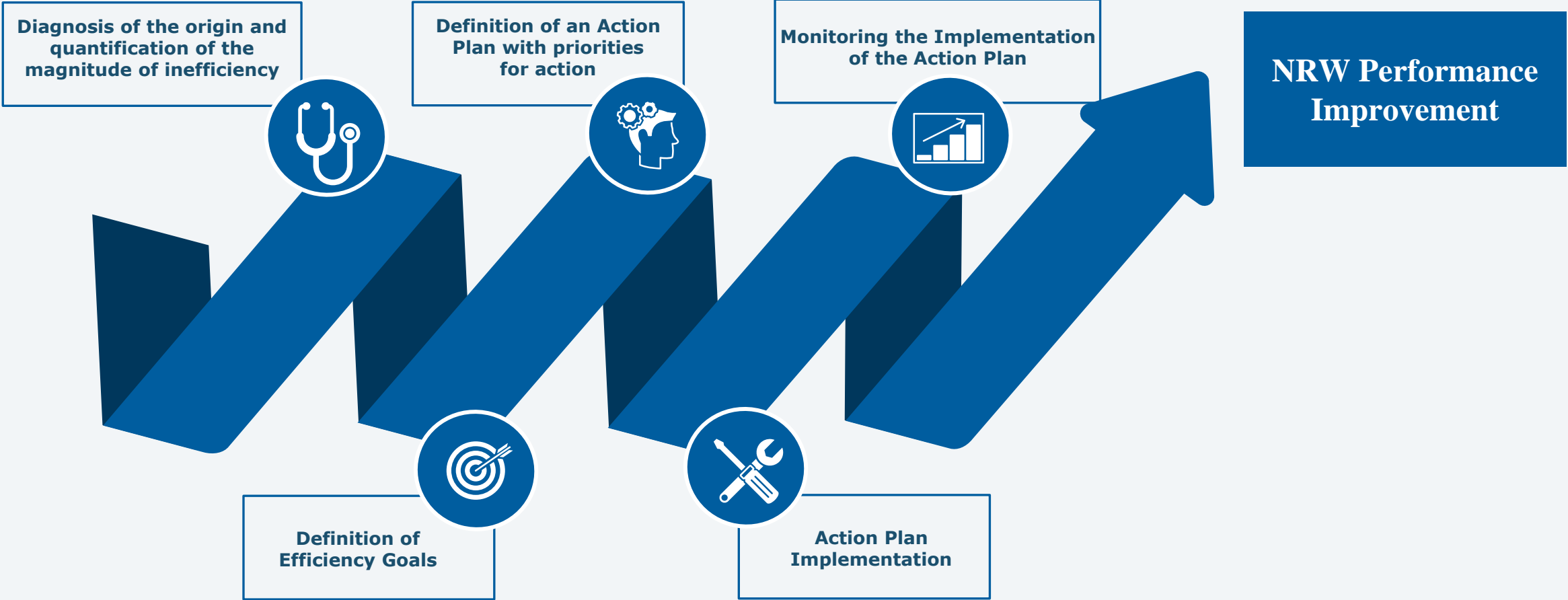
3

**DATA, INFORMATION AND  
MANAGEMENT SYSTEMS,  
TECHNOLOGICAL  
RESOURCES**



**IMPLEMENTATION OF  
PROCESSES AND  
PROCEDURES FOCUSED ON  
EFFICIENCY  
IMPROVEMENT**

# NRW Performance Improvement Process



# NRW Diagnosis based on Water Balance

For global system, for subsystems and DMZ, the main tool for Diagnosis is the Water Balance Calculation and some KPIs obtained based on estimates from each parcel of inefficiency

$$\text{Non Revenue Water (NRW)} = \text{System Input Volume} - \text{Revenue Water}$$

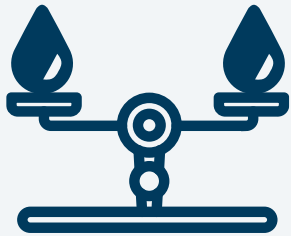
System Input Volume	Authorised consumption	Billed authorised consumption		Revenue water	
		Unbilled authorised consumption			
	Water Losses	Apparent Losses	Unauthorised consumption		Non Revenue Water (NRW)
			Customer meter inaccuracies		
		Real Losses	Leakage on Transmission, Mains and service connections		
Leakage and overflows at storage tanks					

- 1 Calculation of unbilled authorised consumption
- 2 Calculation of Real Losses  
(based on flow monitoring and minimum night-flow analysis, if applicable)
- 3 Calculation of global meter inaccuracies  
(estimated by)
- 4 Calculation of unauthorised consumption

Note: Water-energy nexus is implemented with parallel calculation of energetic balance (when data available)



# NRW Diagnosis: KPIs Calculation



Water balance assessment



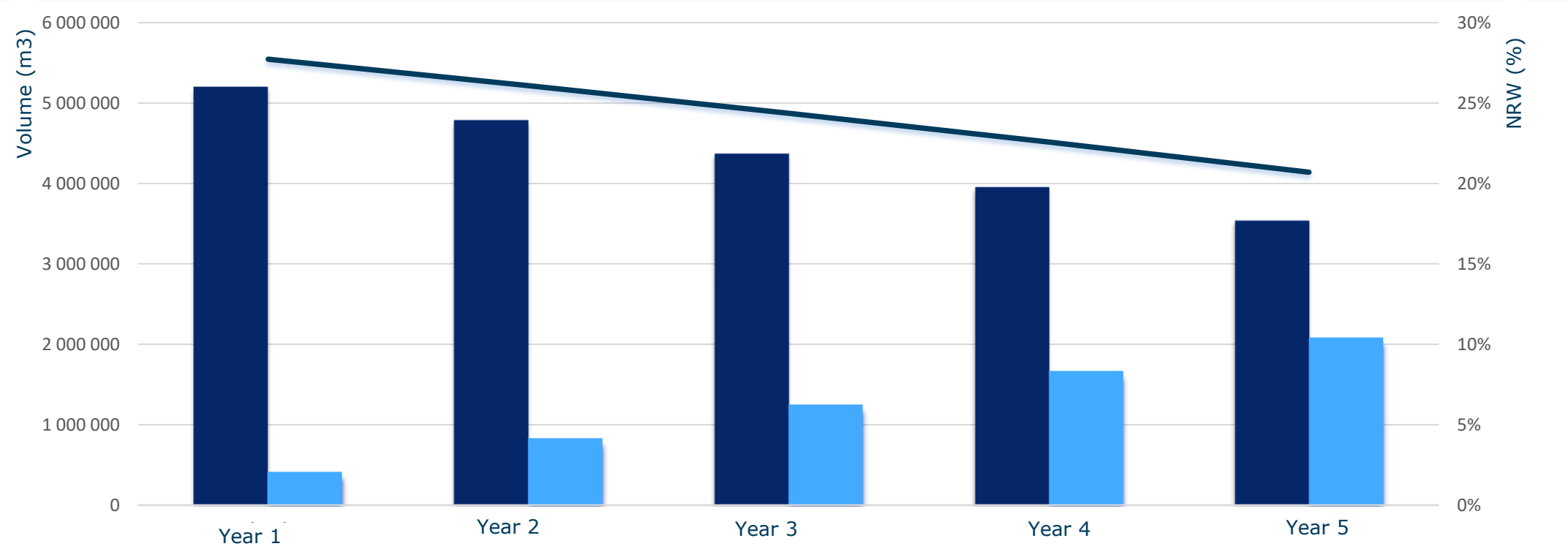
Calculation of NRW KPIs  
(**ex: source of inefficiency :**  
bursts/ 100 km+ **measure**  
**performance:** ILI, m<sup>3</sup>/km.day)



Calculation of KPIs based on the  
**weight in inefficiency to support**  
**the prioritisation of actions** to be  
defined

# Definition of NRW Performance Goals

Example: 5 Years Plan



NRW Performance Projection

Efficiency Projection



# Main Actions: Real Losses Reduction and Control

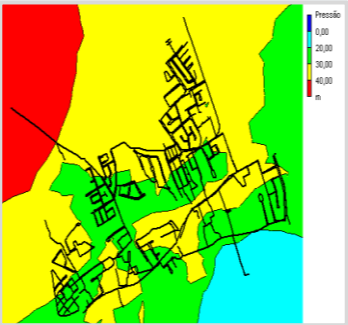
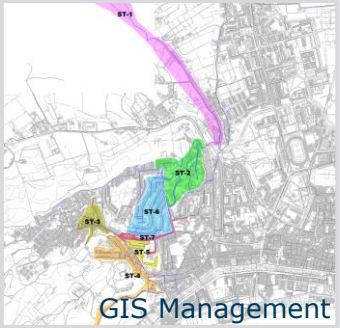
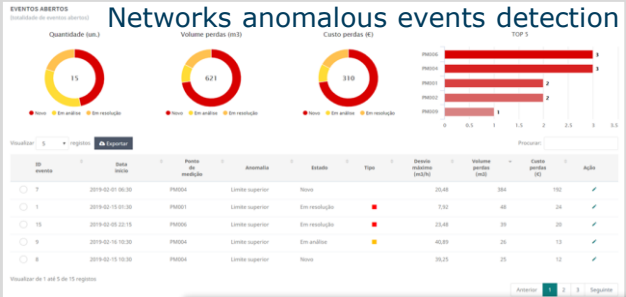
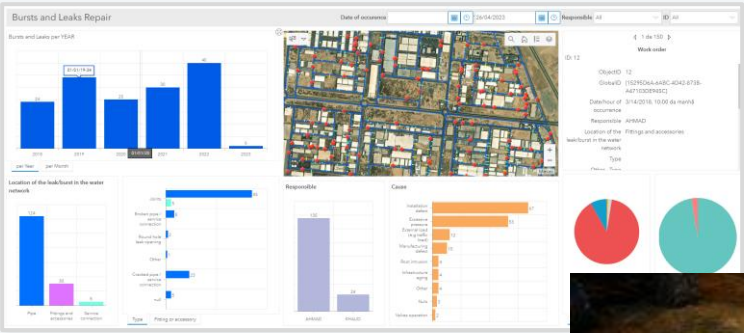
## Real Losses



- Flow monitoring and control
- Active leaks detection
- DMZs Projects and network sensing
- Pressure management (DPZ)
- Operational work orders control (time and quality of repairs)
- Network's rehabilitation

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### Repairs Monitoring and Control



Hydraulic Modelling and Pressure management



Active Leakage detection



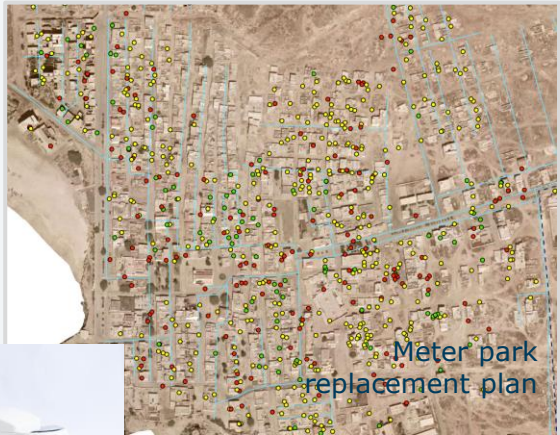
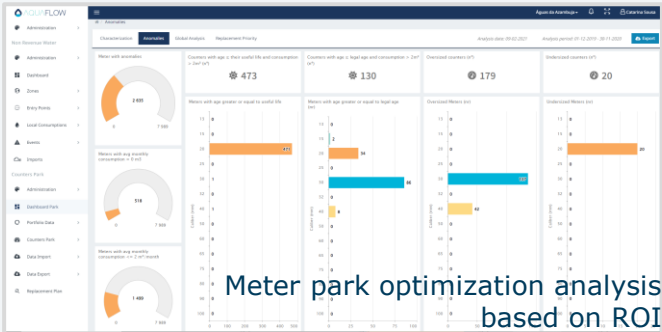


# Main Actions: Apparent Losses Reduction and Control

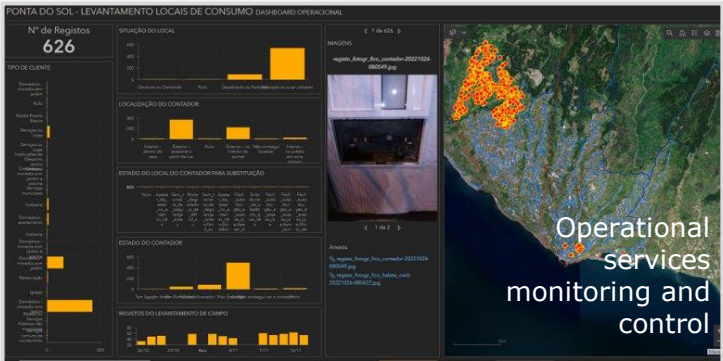
## Metering inaccuracies and customer management inefficiencies



- Meter's replacement optimization based on useful life estimate or other anomalies detected (oversize ou undersize)
- Increase smart metering
- Closely monitoring of Main Customers
- Readings, operational services and customer invoicing process control



Smart metering increase



# Main Actions: Apparent Losses Reduction and Control

## Unauthorized consumption



- Meter's replacement optimization based Consumptions 0 analysis and inspections
- Consumption points inspections
- Videoscopy



6. ESTADO DO CONTADOR

Em Bom Estado

Parado / Avariado / Mau Estado

Antigo

Não conseguiu ver o contador

Não tem contador

7. IDENTIFICAÇÃO CONTADOR @  
preenchimento das seguintes campos

7.1 Marca\*

7.2 Modelo

7.3 DN\*



Service connection **without** illegal connection



Service connection **with** illegal connection



# Action Plan Monitoring and Control

## 4. MONTHLY DETAILED AND FOCUSED KPIS (RESULT AND PROGRESS) AND CORRECTIVE ACTION PLAN

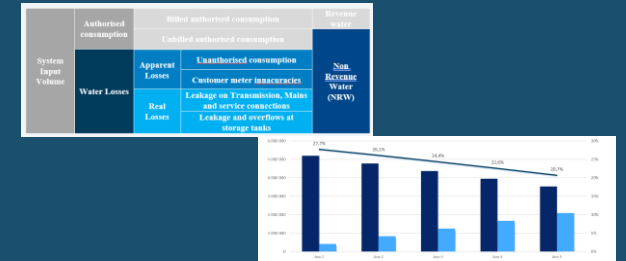
**aquapor NRW PERFORMANCE IMPROVEMENT: ACTION PLAN**

TYPE OF INTERVENTION	Type of action	Type of solution	Risk Rating	Operational	Project Start	Project End	Progress	Cost (€)	Impact (€)	Impact (m³)	Impact (%)
RECURRING INTERVENTION	Water Leakage Detection	Water leak	High	Completed	2023-01-01	2023-01-31	100%	100000	10000000	10000000	100%
RECURRING INTERVENTION	Water Leakage Detection	Water leak	High	In Progress	2023-02-01	2023-02-31	50%	100000	10000000	10000000	50%
RECURRING INTERVENTION	Water Leakage Detection	Water leak	High	Not Started	2023-03-01	2023-03-31	0%	100000	10000000	10000000	0%

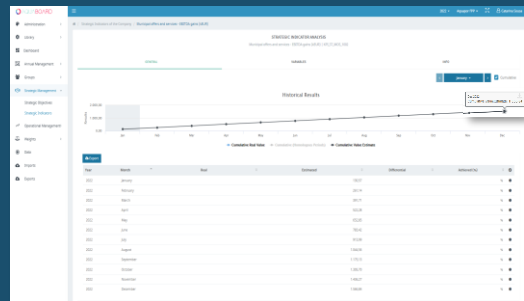
React based on results and implement **CORRECTIVE ACTIONS**

NRW ACTION PLAN structured in 2 MAIN ACTION STREAMS: **REAL AND APPARENT LOSSES**

## 1. NRW REDUCTION FULL PLAN (From Diagnosis > Actions + Procedures to Achieve Goals)



## 3. KPI REPORTING, MONITORING AND CONTROL



MONITOR and CONTROL the implementation of actions

TAKE ACTIONS to achieve the goals

## 2. ACTION PLAN IMPLEMENTATION

**aquapor NRW PERFORMANCE IMPROVEMENT: ACTION PLAN**

TYPE OF INTERVENTION	Type of action	Type of solution	Risk Rating	Operational	Project Start	Project End	Progress	Cost (€)	Impact (€)	Impact (m³)	Impact (%)
RECURRING INTERVENTION	Water Leakage Detection	Water leak	High	Completed	2023-01-01	2023-01-31	100%	100000	10000000	10000000	100%
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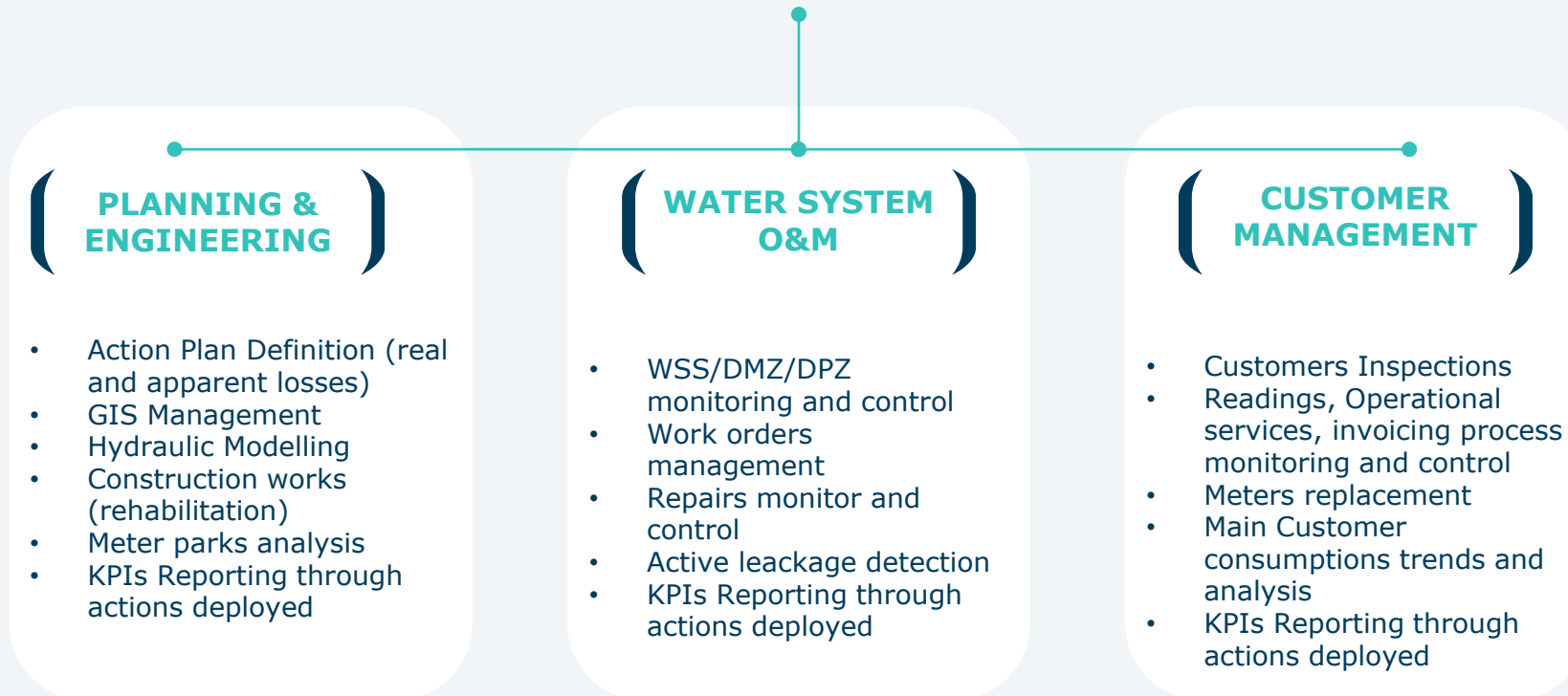


**COMMITTED AND  
FOCUSED TEAM**

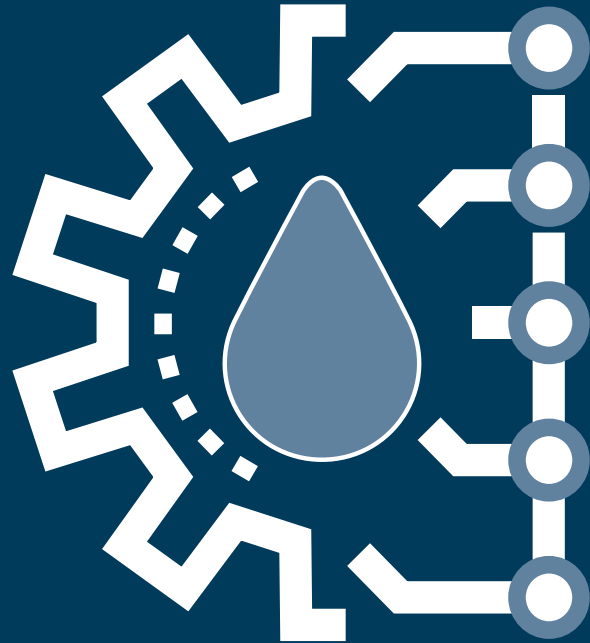
# Committed and Focused Team

## NRW PERFORMANCE IMPROVEMENT PROJECT MANAGEMENT

Full control of the action plan implementation with KPIs analysis, monitoring and control



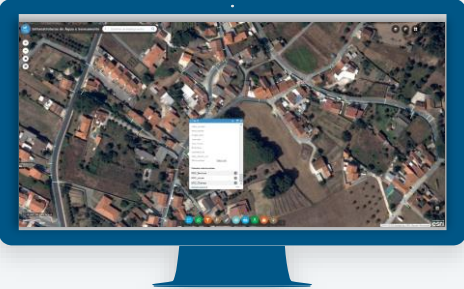




**DATA, INFORMATION AND  
MANAGEMENT SYSTEMS,  
TECHNOLOGICAL  
RESOURCES**

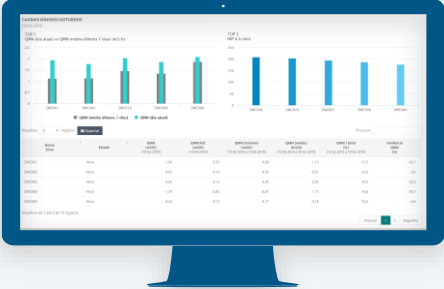
# Data, Information and Management Systems

Assets' inventory



GIS

Volume's data



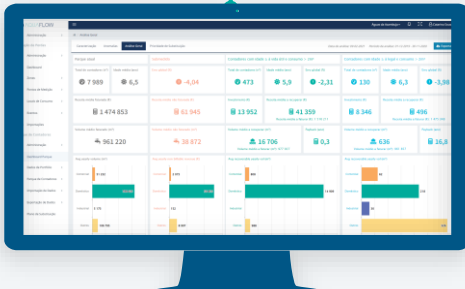
Scada, Flow Monitoring and Performance Networks Management Systems

Network's interventions data



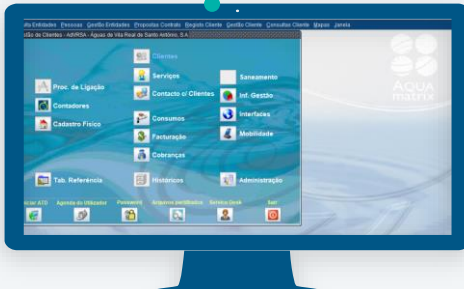
Network Work-orders management system

Water meters park optimization



Meters Park Analysis and Optimization System

Customers' data



Customer Management System

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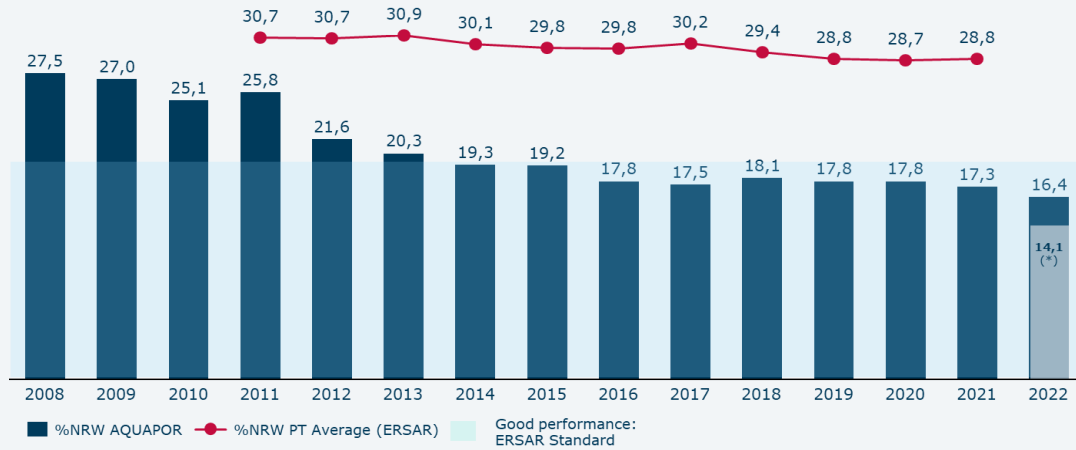


04

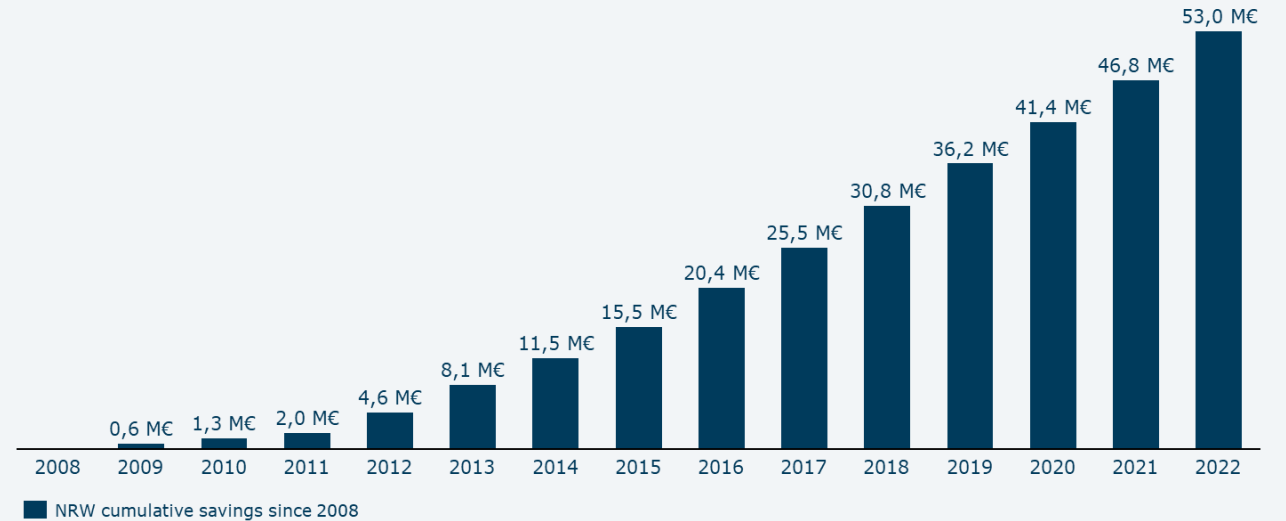
**NRW  
Performance  
Improvement  
Results**

# AQUAPOR Global Results

## NRW (%) evolution since 2008



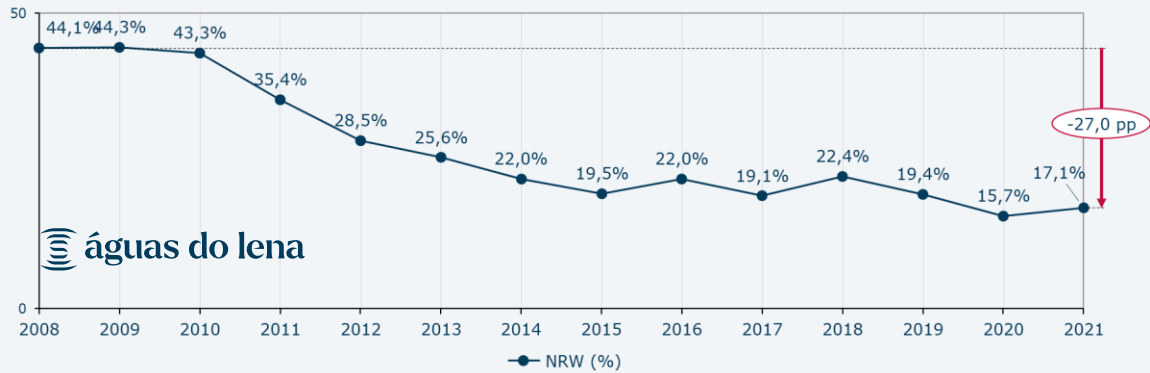
## Cumulative savings since 2008



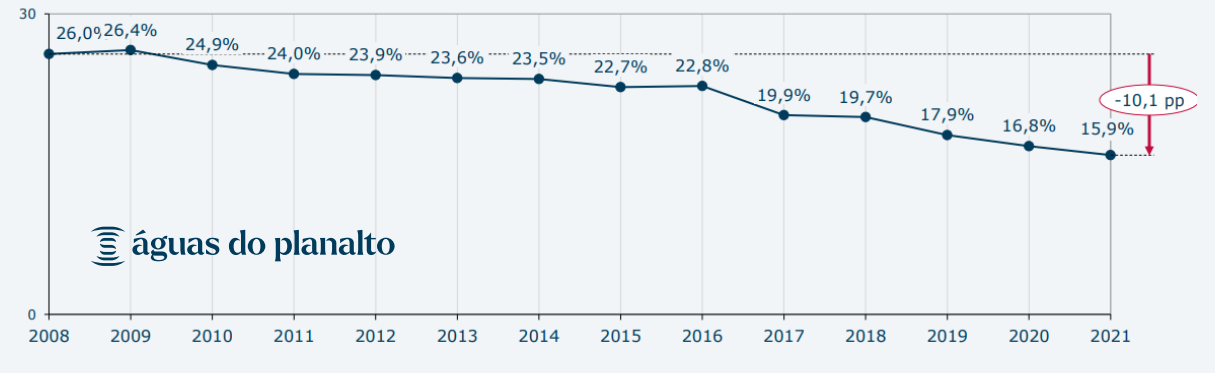
- AQUAPOR Concessionaires reduced NRW from an average of 27,5% to 14,1%
- In these 14 years the NRW reduction plan generated savings around €53 million by revenues increase and operational costs reduction
- Not each single concession has achieved equal performance. The performance is heavily dependent on several factors, such as: networks condition, contractual constrains, responsibility to carry out the investment plan
- Focus on NRW reduction was more intense in concessions that buy bulk water from 3rd parties (acquisition costs are much higher than production costs)

# Results/Concession: Relevant evolutions

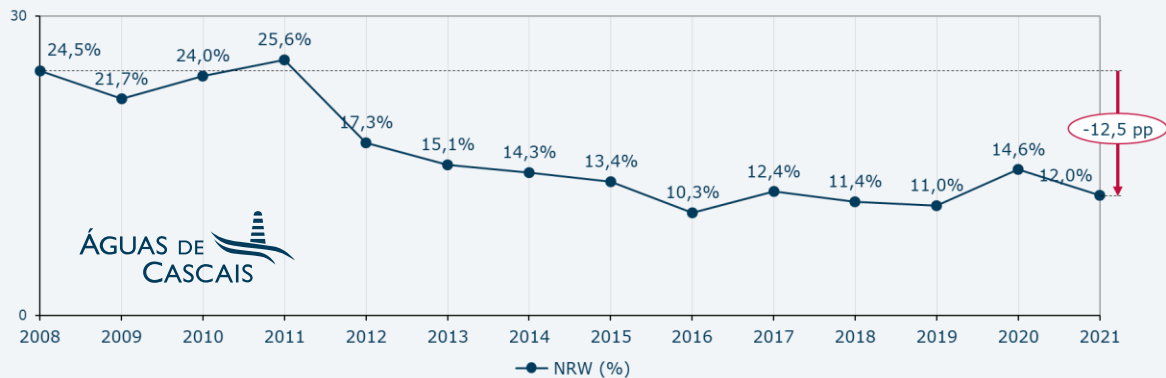
Water Customers (nr)	Water sources (nr)	WTP (nr)	Water Tanks (nr)	Water Pumping Stations (nr)	Water Network (km)	DMZ (nr)	DMZ Network length (km)	Pressure loggers - PL (nr)	PL - Network length (km)	AMR systems (nr of customers with AMR)
8185	8	0	34	11	294	12	147	0	0	0



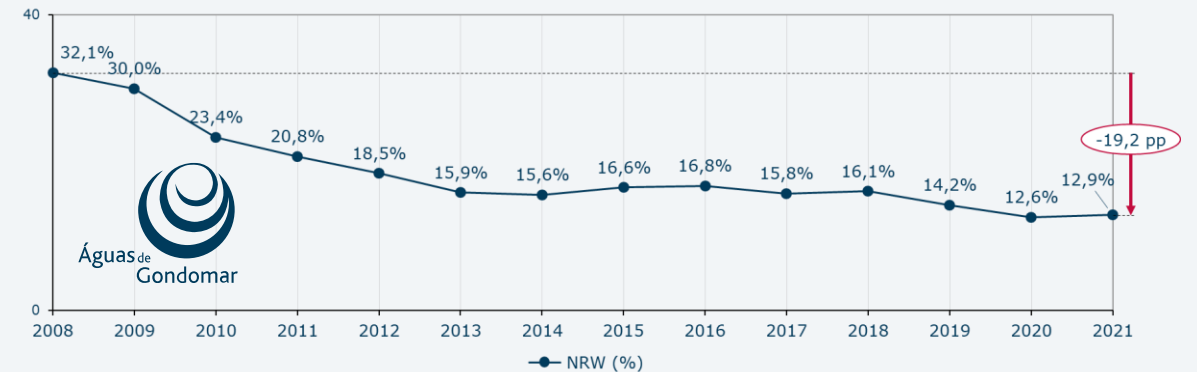
Water Customers (nr)	Water sources (nr)	WTP (nr)	Water Tanks (nr)	Water Pumping Stations (nr)	Water Network (km)	DMZ (nr)	DMZ Network length (km)	Pressure loggers - PL (nr)	PL - Network length (km)	AMR systems (nr of customers with AMR)
35432	39	1	129	22	1 753	154	1 753	91	323	210



Water Customers (nr)	Water sources (nr)	WTP (nr)	Water Tanks (nr)	Water Pumping Stations (nr)	Water Network (km)	DMZ (nr)	DMZ Network length (km)	Pressure loggers - PL (nr)	PL - Network length (km)	AMR systems (nr of customers with AMR)
116 917	16	2	25	22	1 399	59	1 358	0	0	186



Water Customers (nr)	Water sources (nr)	WTP (nr)	Water Tanks (nr)	Water Pumping Stations (nr)	Water Network (km)	DMZ (nr)	DMZ Network length (km)	Pressure loggers - PL (nr)	PL - Network length (km)	AMR systems (nr of customers with AMR)
77365	0	0	31	7	878	179	877	133	658	1 089



# Other Results



**Costs reduction and  
Revenues Increase**



**Best practices  
implementation in  
water supply  
systems  
management**



**Efficient NRW  
reduction and  
control planning**



**Information  
workflows and  
management  
systems  
improvement**



**Customer  
satisfaction  
increased**



**Human Resources  
capacitation**



**Operational and  
maintenance  
processes  
optimization**



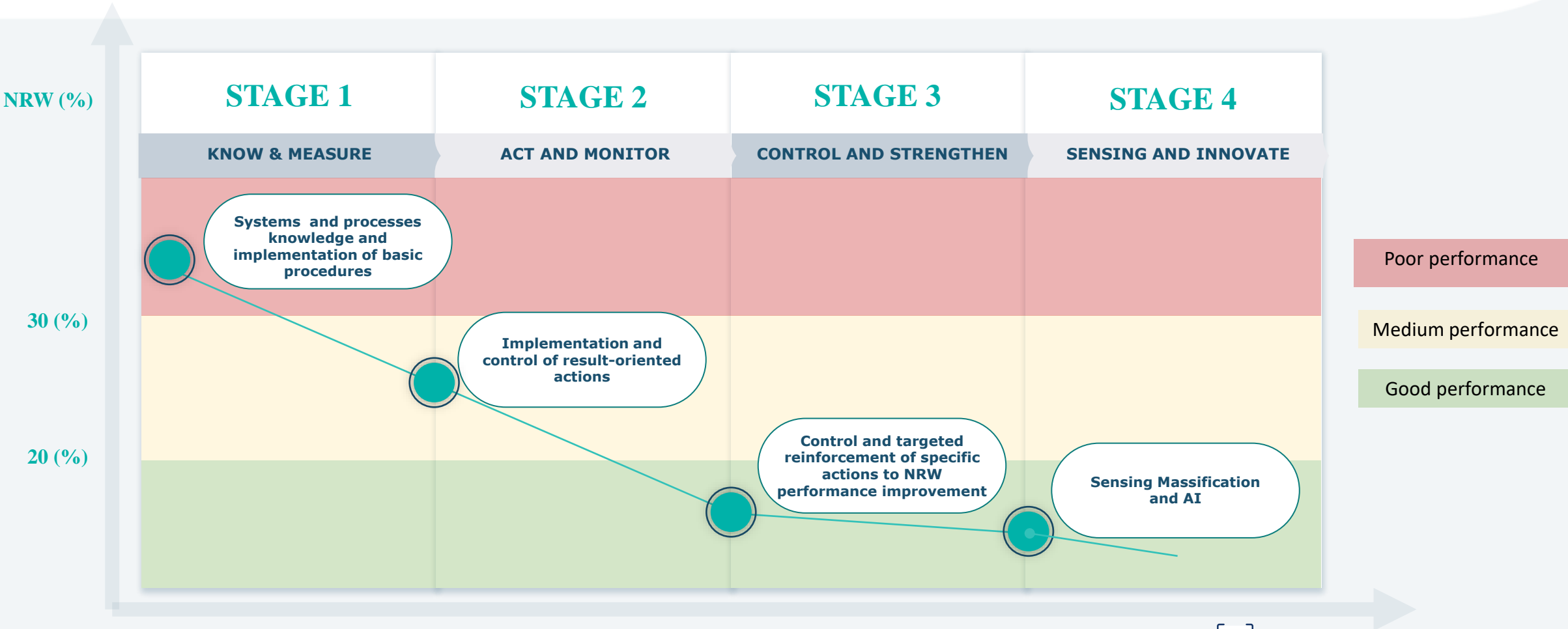
**Digital and  
innovative tools  
and methodologies  
implementation**

05)

## Final Remarks



# NRW Performance Improvement Retrospective



# Our Commitment with #mission water

## Champion the hydric transition

Saur's ambition is to become the best partner to support its customers and communities towards more sustainable and resilient models of water use.

Concession Model

Private-Public Partnerships  
(PPP)

Performance Based  
Contracts

Technical Assistance

Some examples of models of partnership to face this challenge together. If you want to know more about it, you can contact us by contacts below

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[josip.sertic@saur.com](mailto:josip.sertic@saur.com) (+385 91 30 15 283)



## The Aquapor logo, featuring a stylized 'A' icon composed of horizontal lines, followed by the word 'aquapor' in a bold, dark blue sans-serif font.

[#missionwater](#)