



# NON-REVENUE WATER REDUCTION

## AN ORGANIZATIONAL APPROACH TO IMPROVE

**Non-Revenue Water is a major and complex problem, aggravated by increasing water scarcity and climate change. Implementing a NRW Reduction Programme results in numerous benefits for the stakeholders of water companies.**

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Water use has been increasing worldwide by about 1% per year since the 1980s, driven by a combination of population growth, socio-economic development and changing consumption patterns. Global water demand is expected to continue increasing at a similar rate until 2050, accounting for an increase of 20 to 30% above the current level of water use, mainly due to rising demand in the industrial and domestic sectors (UN World Water Development Report 2019).

On the supply side, not only is the gap between water availability and water needs increasing, but when you consider all urban water distribution systems, water losses can reach the staggering number of 346 million cubic meters per day. This is equivalent to 30% of water system input volumes across the world and would be

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# PROGRAMMES

## THE EFFICIENCY OF THE WATER UTILITY



enough to provide water to an additional 2 billion people.

The total cost of such losses for utilities and therefore for the taxpayers and system users can be up to USD 39 billion per year (equivalent to EUR 32.7 billion).

The average amount of water losses differs from region to region but even in regions like Europe there are significant opportunities in terms of NRW reduction and water management efficiency improvement.

Non-Revenue Water is a problem of a colossal complexity and magnitude, aggravated by the increasing water scarcity and the impacts of climate change. If it's not managed timely and properly by governments, public utilities and private operators, it will continue to erode the basis for social and economic sustainable growth, as well as to narrow our options to avoid the depletion of natural resources. All this goes in the opposite direction of the sustainable development goals.

Inevitably, the solution for such problem requires a holistic approach, as in the case of Non-Revenue Water Reduction Programmes, ensuring that NRW levels are reduced as per best practices and then kept under control in the long term.

This is much more than reducing water infrastructure physical and apparent losses. Depending on the scope of the programme, it can reengineer the company's technical and commercial processes, introduce new IT Systems and refurbish old ones, introduce "smart" technology, provide the teams with new skills, introduce management tools focused on results, and generally foster overall utility productivity and efficiency. It can even promote institutional change.



There is an increased awareness of the need to address the problem of NRW and there are important drivers pushing for reduction programmes, mainly related to i) securing water availability, ii) managing water stress, iii) fighting climate change and iv) promoting utilities' sustainability.

The main drivers are:

- Fast growth of towns and cities
- Negative impact of climate change and increasing water scarcity
- Increasing demand for treated water and growing gap between demand and supply
- Growing awareness that water systems must be efficiently operated, and maintained
- Demand for a high-quality service
- Increased availability of funding to improve water operations efficiency
- Need to improve infrastructure resilience to climate change
- Development of contractual models where the service provider assumes part of the risk
- The fundamental need to contribute to meet the Sustainable Development Goals.

Considering the above, for the stakeholders of the water companies, the benefits of implementing a NRW Reduction Programme are more than obvious: i) economic and financial benefits that result from the reduction of the volume of water treated and/or the reduction of costs related to O&M, ii) important environmental benefits through a reduced impact on the environment and less energy consumption, iii) important social and image improvements, iv) transfer of project risks to



the service provider, v) availability of funding and vi) relatively short payback time.

As stated, these and other benefits result from the scope of work of efficiency-oriented contracts, where compensation is indexed to the certified achieved performance with assured pre-contractual economic benefits for the client. Contracts are designed to generate savings that can cover investment (CAPEX) and operational costs (OPEX) of the project and release future additional cashflow through the reduction of OPEX and CAPEX needs.

NRW reduction will allow to pay for the programme implementation and generate additional economic benefits for the utility, releasing financial availability to new investments that subsequently will maintain and reduce NRW levels until the optimum economic level of NRW is achieved.

From an organizational perspective, and by mapping the several dimensions that comprise the organizational model of a company such as a water utility, it becomes clearer why the introduction of a NRW Reduction Programme has the potential

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to transform the organization, boosting its efficiency and overall performance.

Such programmes, developed within the framework of Performance Based Contracts, will impact all the dimensions in a company's organizational model – Structure, IT Systems, Functions, Processes, People, Management Model – well beyond the initial concept related to the reduction of physical and commercial system losses.

A NRW Reduction Programme can include different components that will im-

pact on different dimensions of the utility organizational model:

- Network modernisation
- Network monitoring
- Pressure and flows management
- Active leakage control
- Network repair
- Meter management w/ revenue assurance
- Processes optimisation
- Customer management
- Training and knowledge transfer
- Integration of information systems

- Implementation of a Balanced Score Card
- Monitoring of performance indicators
- Business process digitization

**There is an increased awareness of the need to address the problem of NRW and there are drivers pushing for reduction programmes**



## Many companies have IT systems that need to be updated and integrated and NRW reduction can be the opportunity for a system overhaul



- Economic-financial model revision
- Change Management Programme.

To implement the above components, some of the dimensions that constitute the company organizational model have to be reviewed and modernised, recognising as well that the impacts will go well beyond obvious technical improvements.

To give a few examples of such impacts and in the case of “IT Systems”, it is fundamental to have, for example, Geographical Information Systems, a Billing System or Decision Support Systems that allow effective infrastructure maintenance, client management and internal company management. Many companies have old systems that need to be updated and integrated and a NRW Reduction Programme can be the opportunity for a system overhaul.

Also, the integration of management information into a single platform (Fi-

nancial, Operational, Quality of Service, Human Resources), allows operators to extract the maximum potential of available management information (GIS, CRM, ERP, Excel Operational), focusing the operator on critical management indicators converting data into value.

In the “Processes” dimension, the introduction of a NRW Reduction Programme creates the opportunity to review critical processes. The utility can reengineer processes such as network management, network maintenance, quality control, reporting, client management, etc, aiming to achieve contractual objectives and keep the same level of contracted performance after the contract ends.

This is the case, for example, of the commercial process, from reading the meters to final billing, ensuring an efficient process that will significantly reduce non-billable water. Together with robust commercial systems and motivated commercial teams, the improvements will be significant by reducing unauthorized consumption, measurement errors, reading errors and faults in the commercial cadastre.

As per the technical processes, the objective of reducing NRW will promote

the efficient use of the teams, available systems and technology, to manage system pressures, control leaks, manage the infrastructure and ensure speed in the execution of repair. Key performance indicators such as the number of leakage detections per day or the number of repairs will boost because of more efficient processes.

In the “Functional” dimension, it is not unusual to find out that water utilities need to go through a restructuring process. This is mainly the case of utilities operating in developing countries. In such cases the functions, processes and procedures need to be reviewed to incorporate best sector and organizational practices. These are more complex approaches, but they are critical if we want to ensure that the benefits achieved during the project are sustainable in the long term.

Regarding the above, institutional change may be required at the level of its organizational structure, the responsibilities and tasks, and the procedures and processes. This institutional change is reliant on factors such as readiness to change, resources both human and financial, human change in leadership and management and skills base both technical and personal. Organizational leadership and vision are a must to address all these factors.

The “People” dimension is undoubtedly one of the key-levers to improve the utility's overall performance. Within the framework of a Performance Based Contract there will be a strong focus on improving the organization of the work and to enhance people skills. Remember that Performance Based Models are based on achieving specific NRW reduction objectives in specific moments of time and this will create a very positive dynamic in the team. People will find a correlation between their work and the improvement of the water distribution system and this will motivate them to go further in their efforts.

**NRW reduction will allow to pay for programme implementation and generate additional economic benefits for the utility**





Even in difficult situations like the ones Miya faced recently in some projects, in regions hit simultaneously by natural disasters and the pandemic, the technical teams made a huge effort to maintain the system and to continue with activities such as leak detection and repairs. This happens because they recognize the effort done in the last years led to a much better management of the water system and improved the quality of life of the citizens.

As per the “Management Model” dimension, there is the opportunity to introduce or upgrade management infor-

mation tools and methodologies, such as a Balance Score Card specifically developed for the utility activity. This allows monitoring how the activities related to the infrastructure are ultimately contributing to the improvement of operational and financial indicators and results. Systematic calculation of water balances and KPIs takes place to constantly evaluate the results achieved and benchmark them against the project baseline.

Miya led the largest Non-Revenue-Water reduction performance-based contracts in Manila (Philippines), Nassau (Bahamas), Kingston (Jamaica) and

Emfuleni (South Africa) among others, reducing operational and investment costs, improving revenues and saving water resources to supply safe water in large urban areas worldwide to more population with the existing infrastructure.

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