Requesting country or countries:	Chile
Request title:	AI Pilot for Non-Revenue Water Reduction in Tocopilla, Chile[1]
NDE	Ximena Ruz Espejo Executive Director Agency for Sustainability and Climate Change (ASCC) ximena.ruz@ascc.cl Agustinas 853, Of. 1201 floor 12 Santiago - Chile
Request Applicant:	Jorge Rivas Chaparro Superintendent jrivas@siss.gob.cl Lillo S. Christian Head of Standards Unit clillo@siss.gob.cl Pedro Andrés Fuentes Fica Studies and Standards Engineer pfuentes@siss.gob.cl Rodrigo Farías Flores Studies and Standards Engineer Superintendency of Sanitary Services (SISS) Moneda N°673 floor 1, Santiago. Claudio Cortes Henriquez Reliability Engineer, Aguas Antofagasta ccortes@aguasantofagasta.cl Avenida Grecia Nº 1882 local 1 Antofagasta Ximena Ruz Espejo Executive Director Agency for Sustainability and Climate Change (ASCC) ximena.ruz@ascc.cl Agustinas 853, Of. 1201 floor 12 Santiago - Chile

Climate objective:

■ Adaptation to climate change[2]

☐ Mitigation of climate change

☐ Combination of adaptation and mitigation of climate change

[1] Please note that this document is a translation helped by Gemini 2.5 Pro Preview 03-25 with temperature set to 0, all other parameters at default value. Images are not translated.

[2] As a result of using the desalination plant as a water source, this project has mitigation co-benefits derived from the energy consumption for pumping and desalination of the water.

AYDR

Geographical scope:

☐ Community level

■ Sub-national

☐ National

☐ Multi-country

Problem statement related to climate change (up to one page):

The reduction in rainfall and increase in hydrological droughts determine a greater potential risk to urban water security, especially in the geographical area between the south of the Northern Macrozone and the northern part of the Southern Macrozone (regions from Coquimbo to Biobío), where most of the population is located (MMA, 2020a; Billi et al., 2021; Fragkou et al., 2022).

In this context, water utilities are focusing on strategies such as the use of desalination plants (in the Northern Macrozone, relevant to the utility that will be part of the project) or improving the storage capacity and treatment of surface water (in the Central Macrozone), actions that impact their production costs. In rural sectors, the mega-drought has caused declines in water security, affecting the development of livelihoods, given the reductions in surface supply and the drop in groundwater levels.

In certain parts of the country, the reduction in surface water availability has led to conflicts between human consumption and productive sectors such as irrigation and mining, as well as the search for alternative water provision methods to address water insecurity, such as supply via water trucks (Bauer, 2015; Budds, 2020; Prieto et al., 2019; Donoso, 2021; Barría et al., 2021).

The urgency of addressing water losses is intensified in the locality of Tocopilla. Historically designated as a "sacrifice zone" due to the high concentration of heavy industry, including multiple thermoelectric power plants (although several are in the process of closing), the commune faces legacies of environmental vulnerability and public health challenges. In this context of water stress exacerbated by climate change and critical dependence on desalinated water (with high energy and economic costs), optimizing water resource management is fundamental. Reducing the current 39% Non-Revenue Water (NRW) in Tocopilla is not only key for water security (adaptation) and energy efficiency (mitigation), but also for strengthening the overall resilience of a community facing multiple socio-environmental pressures.

The use of water trucks, while attempting to alleviate the decrease in groundwater levels and supply failures and/or cuts, has not resolved the structural problems of water insecurity for human consumption and subsistence, where in some areas, water quality is also not guaranteed (Bauer, 2015; Budds, 2020; Prieto, 2017).

The National Water Resources Strategy of the Ministry of Public Works (MOP) and the report of the National Water Roundtable 2020 mention that one of the priority challenges for the sector is the minimization of drinking water losses due to leaks, breaks, and other technical deficiencies occurring in drinking water supply networks.

Chile has decided to prioritize water for human consumption and particularly the reduction of its losses, including two related commitments in contribution A7 of its NDC:

* By 2030, 100% of the goals of the 2030 Agenda for the water sector[3] will have been completed.
* By 2030, water losses represented by the volume of non-revenue water from water systems will be reduced by at least 25%.

[3] The 2030 Water Sector Agenda is organized into projects. Within its Project 2, it establishes that a national program for water loss reduction will be carried out, in a participatory manner and with an active role for water utilities. Legal reforms that promote this objective will be studied and proposed. Innovation projects incorporating smart technologies that allow for network monitoring will be encouraged, aiming for an Industry 4.0 approach and increasing the replacement of obsolete infrastructure.

The long-term climate strategy reiterated the commitment contained in the NDC, adding a resilience goal related to losses:
* Goal 5.1: By 2030, 90% of the population will have continuity of service during disruptive events.
* Goal 5.3: By 2030, the volume of non-revenue water will be reduced by at least 25%.

This priority is also endorsed in other public policy documents, such as the 2021 drought plan and the aforementioned 2030 Agenda for the water sector.

An expert committee convened for the preparation of this technical assistance noted that there is still a gap between micro-level non-revenue water detection solutions, as some projects have developed, and a macro-level system that allows identifying areas where more focused efforts should be deployed.

Past and on-going efforts to address the problem (up to half a page):

The study "Detection and localization of leaks in drinking water distribution networks in a large city in Chile using a neural network classification algorithm" was developed for the commune of Santiago, determining 73% accuracy in leak identification by the model; however, it was considered that the quality and quantity of data were insufficient for scaling up (Gárate, 2021)[4]. In this sense, another author continued this research, expanding the study area to 4 communes to increase information sources and achieved an accuracy greater than 90%. This value is consistent with other studies conducted in other countries. For example, in Taiwan, a system with an accuracy greater than 95% was proposed, reducing traditional leak detection costs (which included breaking pavements to identify pipes with water outflow) by 26% (Tsai, 2022)[5].

In the Metropolitan Region, a hydraulic model of the drinking water network was developed using EPANET software[6]. With this model, training and validation datasets were generated, corresponding to network pressures for different operating states and leak locations, allowing the adjustment of the classifier for leak detection in the network. The results of the training and validation process show good performance for leak detection in the study network, with accuracies of 99%, 96%, and 97% observed for 3 study cases that progressively increase the problem's complexity. The author validated the neural network algorithm for leak detection in a study network and determined it to be a better option compared to other supervised algorithms like support vector machine (SVM) proposed by other authors.

During 2021, and in line with the stated climate problem, a Public Interest Innovation Challenge by ANID (National Agency for Research and Development) was awarded to SISS: "Detect, locate, measure, and quantify drinking water losses in the water sector". Its objective was to develop and implement an innovative solution to detect, locate, and measure drinking water losses from water utilities; define alerts; and make loss information available and visible. Within this project, endogenous capacities were strengthened, and a participating company, AIWATER, developed a sensor that allows the detection and quantification of water losses through a model created with machine learning algorithms, using data from one of the facilities of the water utility Aguas Santiago Poniente as a base.

Figure 1: Developed sensor

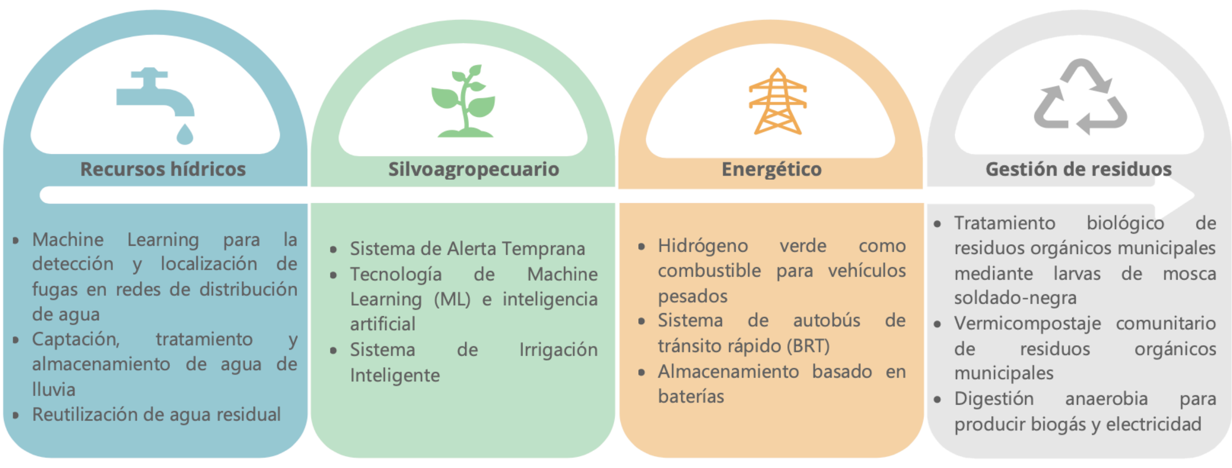
[4] Gárate B. (2021) Detection and localization of leaks in part of the Santiago water distribution network, using a support vector machine (SVM).
[5] Tsai, Y.-L. ; Chang, H.-C. ; Lin, S.-N. ; Chiou, A.-H. ; Lee, T.-L (2022). Using Convolutional Neural Networks in the Development of a Water Pipe Leakage and Location Identification System. Appl. Sci., 12, 8034. https://doi.org/10.3390/app12168034
[6] EPANET is free software developed by the United States Environmental Protection Agency (EPA). It is widely used in the field of hydraulic modeling of drinking water distribution networks due to its flexibility, ease of access, and ability to integrate with various programming languages, such as Python. This means it is possible to generate input data and develop detection algorithms within a single, consistent programming environment.

However, to continue this development and advance its TRL (Technology Readiness Level) in order to deploy the solution, the following steps are necessary:

* Pilot run (soft launch).
* Plan and execute structural changes to the hardware in the field.
* Plan and execute changes to the monitoring platform.
* Execute more leak tests and implement other variables.
* Analyze model performance.

In parallel with the execution of this project, Chile's technology needs assessment was conducted. This process began with the identification and prioritization of sectors and technologies, responding to 7 challenges for the urban drinking water subsector and 5 challenges for the rural drinking water subsector, related to drought and water availability, access to drinking water in rural areas, alternative water sources, losses in the drinking water network, wastewater reuse, disaster risk management, among others. A multi-criteria analysis methodology was used for the selection of these technologies through a participatory process. Finally, a sensitivity analysis of the results was performed, concluding with the prioritization of 3 technologies for the Water Resources sector.

Figura 2. Tecnologías priorizadas por sector para el desarrollo de las TAP



The water resources sectoral working group prioritized the following technologies: (i) machine learning for leak detection and localization in water distribution networks; (ii) rainwater harvesting, treatment, and storage; and (iii) wastewater reuse.

One of the outcomes of this project was the development of a technology action plan for the water sector, including 4 major lines of work associated with the use of machine learning in leak detection: Strengthening the regulatory framework to create economic incentives for investment in solving leaks; strengthening public-private partnerships; developing a supportive technical guide to encourage the implementation of solutions; and developing an institutional strategy to strengthen the inspection service for reducing water leaks.

The focus on innovation and digital technologies reflected in these projects and processes is a consequence of traditional methods for identifying leaks in the pipe network being expensive and imprecise, as they require excavations to identify leak zones, but these are not always performed in the correct areas, necessitating further searches in other potential areas. Therefore, new technologies for leak detection and localization are being explored, as literature supports their higher accuracy based on existing information monitored through different sensors placed in the pipes, as well as historical records (Chen et al., 2019[7], Lobos, 2022)[8].

Currently, SISS is in the final stage of modifying the guide that defines the preparation and minimum information required for the Development Plans, which are prepared every 5 years by the country's water utilities. This change specifically establishes that hydraulic models for both drinking water networks and wastewater networks for each concession area must be submitted, requiring delivery in formats compatible with WaterCAD and SewerCAD software, aiming to drive a paradigm shift in network management by concessionary companies and support review by the Companies and Inspection areas.

Although current regulations do not empower SISS to impose requirements regarding Non-Revenue Water (NRW) levels, since 2023, work has been carried out in a public-private technical roundtable with water utilities represented by the business association ANDESS. In August 2024, a medium and long-term voluntary commitment was signed. In the medium term, by 2033, the proposal is to reduce levels to 29%, and in the long term, to achieve the goal of 25% nationwide.

SISS has also instructed the water sector on modifications regarding macro-metering (bulk metering) (2023) and micro-metering (customer metering) (mid-2024) of drinking water. The objective of both instructions is to improve data quality and adequately differentiate the various components of the so-called Non-Revenue Water, composed of Unaccounted-for Water (UAW)[9] + Authorized Unbilled Consumption.

Finally, SISS recently contacted water utilities to implement a machine learning pilot, reaching an agreement with Aguas de Antofagasta to implement a pilot if support for its implementation can be obtained. Aguas Antofagasta is a pioneering company in Chile in the installation of digital metering on drinking water meters, which provides daily consumption data on an hourly basis, thus benefiting the algorithm's learning. Additionally, the company is highly committed to the circular economy, commitments reflected in the Clean Production Agreement (APL) for Transition towards the Circular Economy, an initiative promoted by Acción Empresas and the Agency for Sustainability and Climate Change.

The water supplied by Aguas Antofagasta systems in Tocopilla comes from a desalination plant with a production and distribution cost of 2.15 USD per m3. Non-Revenue Water amounts to 39% as of 2024, with 8% of the total corresponding to theft or other uses.

These technological and regulatory efforts at the national and sectoral levels are complemented, in the case of Tocopilla, by territorial environmental management instruments such as the Atmospheric Decontamination Plan in effect since 2010 (D.S. 70/2010 MINSEGPRES), which seeks to address the historical air pollution in the area. This technical assistance request for efficient water management aligns with and complements these broader efforts to improve the environmental quality and resilience of the commune.

[7] Chen, Z., Mauricio, A., Li, W., & Gryllias, K. (2019). Multi-label fault diagnosis based on Convolutional Neural Network and Cyclic Spectral Coherence. Presented at the Surveillance, Vishno and AVE conferences, INSA-Lyon, Université de Lyon, July 2019, Lyon, France.

[8] Lobos J. (2022). Detection and localization of leaks in drinking water distribution networks in a large city in Chile using a neural network classification algorithm.

[9] Unaccounted-for Water (UAW) represents the losses in a system. It can be classified into technical and commercial losses, which are determined using Water Balances by zones, a methodology implemented by the IWA (International Water Association

Specific technology barriers (up to one page):

Identified Barriers:

1. Institutional, Policy, and Regulatory

* **Lack of cost-effective water loss reduction targets in some water utilities:** According to interviews with representatives of the Superintendency of Sanitary Services (SISS), water utilities do not manage all the water leaks they identify because it is not profitable for them[10]. In this sense, some companies have calculated an optimal loss level where repair actions cost less than planned repairs (in other words, water loss reduction targets). However, according to the study "Standards for the determination of non-revenue water and water balance," only 3 out of the 10 consulted companies use this methodology, so it should be extended to help focus efforts on those companies with higher loss rates.

In this regard, SISS lacks the authority to set water loss reduction targets for water utilities, meaning it would have to generate voluntary agreements with them. This could impede the rapid adoption of technologies to reduce water leaks because mandatory incentives cannot be established.

* **No fines for water leaks in water distribution networks:** The regulatory framework applied to water utilities establishes the definition of a "model company," which is used as a reference to optimize service provision. The activities this type of company must carry out begin at the water resource abstraction stage (including regulatory infrastructure), continue with obtaining the corresponding permits for its use, and culminate when treated wastewater is returned to a natural water body or the ocean. Following this definition, the water efficiency of the "model company" is not directly subject to inspection, with only objectives related to the quality of service to the user (e.g., continuity, water quality, pressure) being relevant for that purpose.

In this context, it is not possible to establish fines based on the percentage of water lost in distribution networks because the regulations omit them and only consider them if they cause losses in the continuity of water supply. Thus, in practice, water leaks far exceed those incorporated in the "model company," meaning water utilities have fewer incentives than might be expected for introducing new leak identification technologies.

* **Limited inspection staff for water utilities:** If fines were established for water utilities due to water leaks, they might not be adequately implemented. Based on the interviews conducted, it was inferred that the number of agents available to SISS in the Technical Unit, Information Unit, and Studies Area would be insufficient to oversee the water utilities and ensure compliance with the Law, particularly the use of current legislation for fines related to drinking water supply cuts, which could incentivize increased pipe replacement, thereby reducing leaks.

2. Technical and Capacity

* **Limited data availability:** The main limitation for applying machine learning methodologies in leak detection and localization in water networks is the lack of information regarding leaks detected in the field system. This requires records of information on pipe materials, dimensions, sector demand estimates, and the location of network elements (valves, tanks, and their characteristics). The lack of information also affects data calibration processes, as some studies have determined that not having real behavioral data from hydraulic networks could generate artificial results (Lobos J., 2022).

In Chile's case, SISS maintains records of water utility infrastructure information according to information protocol PR012001, which includes a chapter on cartographic files that water utilities have been sending since 2012 in shapefile format. Likewise, non-revenue water production is collected to generate an annual record. However, these quantities might be underestimated because the information is obtained by request from distribution companies, who sometimes do not submit their reports (SISS, 2022).

In this sense, the rest of the data necessary for implementing these technologies would be collected by the water utilities but are not available for use by other interested parties because there is no responsible institutionality for their collection and provision (Fundación Chilena del Pacífico, 2021).

* **Extensive time required for input data generation:** Lobos J. (2022) concluded that generating input data for machine learning algorithms requires a long time due to the series of necessary hydraulic simulations. Specifically, it took 15 hours for a set of 100 pipes, corresponding to 2% of the pipes in the Metropolitan Region's network. Considering that the simulations were performed on the technical infrastructure of the National Laboratory for High-Performance Computing (NLHPC) at the University of Chile, whose hardware is significantly superior to a standard computer, significantly more time would be required for the complete evaluation of the studied hydraulic network.

[10] This is addressed in greater depth in subsection 2.1.2, Chile Water Resources TAP 2024

*   **Difficulty in modeling water networks:** In some cases, it can be complex to represent the water flows of a network in a hydraulic model because consumption is not constant throughout the day or the study area may not have been correctly represented in the water distribution plans. This could impact the accuracy of calibration processes (Gárate B., 2021).
*   **Lack of previous experiences:** It was identified that the country's water utilities typically use technologies such as geophones, tracer gas, or acoustic correlators to reduce water losses; however, experiences involving leak detection and localization using machine learning techniques were scarce.

3. Socio-cultural, Informational, and Awareness
*   **Limited capacity of water utilities to repair water leaks:** As part of the study "Standards for the determination of non-revenue water and water balance," a series of interviews were conducted with 10 water utilities in Chile. In these, all confirmed that more leak events are detected than are repaired, because it is not profitable. Consequently, some companies like SACYR stopped their leak detection activities to match the number of identified leaks with the number of repairs performed. In this context, promoting the adoption and implementation of new technologies for water leak detection is challenging.

Sectors:

Please indicate the main sectors related to the request:

☐ Coastal zones
☐ Early Warning and Environmental Assessment
☐ Human Health
■ Infrastructure and Urban planning
☐ Marine and Fisheries
■ Water
☐ Agriculture
☐ Carbon fixation
☐ Energy Efficiency
☐ Forestry
☐ Industry
☐ Renewable energy
☐ Transport
☐ Waste management

Please add other relevant sectors:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

■ Communication and awareness
■ Economics and financial decision-making
■ Governance and planning
☐ Community based
☐ Disaster risk reduction
☐ Ecosystems and biodiversity
■ Gender

Technical assistance requested (up to one page):

General Objective:
Advance the implementation of the technology action plan for reducing non-revenue water in urban drinking water systems by supporting an Artificial Intelligence technology pilot in the locality of Tocopilla, generating evidence and capacities to overcome key barriers identified in the Technology Action Plan, and to identify a local champion to test and showcase the a climate technology solution.

Set of activities expected to be executed by the technical assistance: ($250.000 USD)
1. Support a pilot of a system to identify non-revenue water with the company Aguas de Antofagasta, allowing prioritization of efforts according to the zone and type of non-revenue water, addressing the lack of previous experiences and generating local evidence on technical feasibility. Identify if service interruptions resulting from major failures (potentially detectable by the system) disproportionately affect women and girls, or the gaps preventing such assessment.
2. Evaluate the availability and quality of required data (flow, pressure, billing, GIS, etc.), directly addressing the barrier of limited data availability and quality for ML models.
3. Prepare a dashboard to facilitate the visualization and identification of where non-revenue water occurs, as well as the generation of water balances by sectors, facilitating visualization and analysis to overcome barriers in interpreting results and decision-making.
4. Train the company (Users, administrators, and regulator) in the management, modeling, analysis of their data, and updating the dashboard and associated systems, addressing the technical and capacity barriers identified in the utility and the regulator, and ensuring equitable participation of women and men.
5. Develop a roadmap to scale up implementation and resolve the detected non-revenue water issues, including relevant gender aspects and proposing solutions to institutional, financial, and regulatory barriers for scaling up.
6. Conduct a dissemination workshop for the roadmap and the the pilot results with representatives from the Tocopilla community, Aguas Antofagasta, SISS, ANDESS, AIDIS, CAPTA University of Chile, Global Change UC, University of Antofagasta, etc., contributing to overcoming information barriers and fostering collaboration and demonstration this climate technology through a local champion.

Each activity must be executed in synergy and consideration of the Previous and Ongoing Initiatives indicated in this form, as well as consider the participation of the actors involved in said initiatives and the technology action plan, as relevant.

Deliverables:
1. Pilot results report (technical elements) including the assessment of data availability and quality, as well as an analysis of scalability and applicability to different realities.
2. Non-revenue water dashboard to facilitate the visualization and identification of where non-revenue water occurs, and water balances by sector (DMA, Tank Zones, Booster Zones, etc.).
3. Training report for users, administrators, and the regulator on data management, modeling, analysis, and updating the dashboard and associated systems.
4. Roadmap for scaling up implementation and resolving detected non-revenue water issues.
5. Workshop dissemination report.

Expected timeframe:

The expected duration of this technical assistance is 12 months.

Anticipated gender and other co-benefits from the technical assistance:

In addition to contributing to water resource management, the implementation of elements of the technology action plan for identifying and reducing non-revenue water in Tocopilla would contribute in other aspects:

* **Water resource conservation:** Implementing technology to help reduce non-revenue uses promotes the establishment of more efficient drinking water distribution systems, contributing in turn to reducing the pressure and costs associated with desalination capacity.
* **Reduction of GHG emissions:** By decreasing losses of desalinated water, the energy consumption associated with its production and pumping is reduced, mitigating greenhouse gas emissions (mitigation co-benefit).

*   **Reduced risk of infrastructure damage:** Early detection of leaks prevents major damage to the network itself and surrounding infrastructure (pavements, buildings) caused by undermining or soil saturation.
*   **Gender:** Improved service reliability (fewer interruptions due to major breaks) can disproportionately benefit women and girls, who often bear greater responsibilities for domestic water management. Equitable participation in training will be promoted.
*   **Social:** Improves the quality and continuity of drinking water service, an essential element for well-being and public health, particularly relevant for strengthening community resilience in a locality historically exposed to environmental pressures like Tocopilla. By optimizing the use of resources by the regulator and the utility previously spent on less efficient leak detection and repair, resource allocation is improved.

Key stakeholders:

Please list the stakeholders who will be involved in the implementation of the requested CTCN technical assistance and describe their role during the implementation (for example, government agencies and ministries, academic institutions and universities, private sector, community organizations, civil society, etc.).

Stakeholders	Role to support the implementation of the technical assistance
National Designated Entity (Public)	Agency for Sustainability and Climate Change.
Request Applicant	Superintendency of Sanitary Services (SISS) (Public). Aguas Antofagasta - Counterpart for the Pilot and local champion for the technology (Private). Agency for Sustainability and Climate Change (Public).
Private	Aguas Antofagasta - Counterpart for the Pilot and local champion for the technology. National Association of Water Utilities (ANDESS), dissemination of results.
Academia	CAPTA University of Chile, Global Change UC, and University of Antofagasta, dissemination of results, potential feedback into the roadmap.
NGOs and civil society	Tocopilla Community, dissemination of results, potential feedback into the roadmap.
International Organizations	Inter-American Association of Sanitary and Environmental Engineering (AIDIS), dissemination of results internationally.

Alignment with national priorities (up to 2000 characters including spaces):

Reference document	Extract
Nationally Determined Contribution (NDC)	Chile's Nationally Determined Contribution (NDC) 2020, page 22. 5.2.2 Areas of Greatest Urgency in Climate Action Regarding Adaptation Contribution in Adaptation No. 7 (A7)

	A7) The country's information and management mechanisms regarding the impacts of climate change on water resources will be increased to enhance its resilience. f) By 2030, 100% of the goals of the 2030 Agenda for the water sector will have been completed. h) By 2030, water losses, in terms of the volume of non-revenue water from water systems, will be reduced by at least 25%.
Technology Needs Assessment	Elements of the Technology Action Plan for Water Resources in Chile 2024. https://www.ctc-n.org/technical-assistance/projects/technology-needs-assessment-tna-and-technology-action-plan-tap-chiles
National Adaptation Plans	Draft National Adaptation Plan for Water Resources, page 77[11].
Nationally Appropriate Mitigation Actions	
Add others here as relevant	Chile's First Biennial Transparency Report (BTR), Table 8 and Capacity-building Needs (CRT) pages 449 and 495. First Biennial Transparency Reports | UNFCCC. SISS Medium-Long Term Strategic Plan, known as the 2030 Agenda for the Water Sector. Plan Estratégico Agenda Sector Sanitario 2030.

Development of the request (up to 2000 characters including spaces):

This specific request was developed by the CTCN NDE [National Designated Entity] during the development and subsequent follow-up of the TNA [Technology Needs Assessment] process, which concluded in 2024, and the prioritization of elements from its technology action plan for the water resources sector. The NDE has been involved in discussions with the CTCN regarding this request since the 2023 National Designated Entities Forum held in Panama City, conducting consultations and dialogues with various public bodies during its development, including the General Water Directorate (Dirección General de Aguas), the Superintendency of Sanitary Services (Superintendencia de Servicios Sanitarios - SISS), the National Agency for Research and Development (Agencia Nacional de Investigación y Desarrollo - ANID), the Ministry of Science, Technology, Knowledge and Innovation, and the National Association of Water and Sanitation Utilities (Asociación Nacional de Empresas de Servicios Sanitarios - ANDESS). Following these discussions, two potential technical assistance options emerged, with priority given, at the request of the water authority, to the pilot project in northern Chile with the company Aguas Antofagasta. The locality of Tocopilla was selected for this pilot due to a combination of critical factors: a high level of NRW (Non-Revenue Water) (39%), reliance on desalinated water with its associated energy costs, the existence of enabling infrastructure (advanced digital metering), and its status as an area with historical socio-environmental vulnerability requiring priority interventions to strengthen resource management and community resilience.

Background documents and other information relevant for the request:

[11] As this is the draft version, the document can be shared privately with the CTCN, keeping in mind that the final version has not yet been issued by the authority and may contain changes to its content.

- This request was not developed with support from the CTCN Request Incubator Programme, but it has been supported by the regional office.
- SISS Medium-Long Term Strategic Plan, called the 2030 Water Sector Agenda (Plan Estratégico Agenda Sector Sanitario 2030).
- Tocopilla Communal Report 2024, BCN (Biblioteca del Congreso Nacional de Chile - Library of the National Congress of Chile). *Tocopilla - Reporte Comunal* .
- Sacrifice Zones in Chile: Quintero-Puchuncaví, Coronel, Mejillones, Tocopilla y Huasco: Industrial Component and Population Health (2022). *Zonas de sacrificio en Chile: Quintero-Puchuncaví, Coronel, Mejillones, Tocopilla y Huasco*.
- The "Alignment with national priorities" table contains several relevant references that have not been duplicated here.

Monitoring and impact of the assistance:

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the technical assistance provided by the CTCN. I understand that these processes will be explicitly identified in the CTCN Response Plan and that they will be used in the country to monitor the implementation of the technical assistance following standard CTCN procedures.
I understand that, after the completion of the requested assistance, I shall support CTCN efforts to measure the success and effects of the support provided, including its short, medium and long-term impacts in the country.

Signature:

NDE name:	Agency for Sustainability and Climate Change (ASCC)
Date:	On electronic Signature
Signature:	On electronic signature

THE COMPLETED FORM SHALL BE SENT TO THE CTCN@UNEP.ORG

The CTCN is available to answer all questions and provide guidance on the application process.

FIRMA ELECTRÓNICA AVANZADA • GOBIERNO DE CHILE •

Firmado por:
Ximena Carolina Ruz Espejo
Directora Ejecutiva
Fecha: 15-04-2025 16:40 CLT
Agencia de Sustentabilidad y Cambio Climático

AYDR