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Support to Armenia's Second Generation Water PPPs

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REVIEW OF ARMENIA'S EXPERIENCE WITH WATER PPPs

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ABBREVIATIONS

ADB	Asian Development Bank
AFD	*Agence Française de Développement*
AMD	Armenian Drams
ASWC	Armenia State Water Company
AWSC	Armenia Water and Sewerage Company
CJSC	Closed Joint Stock Company
CMU	Contract Monitoring Unit
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
EU	European Union
EUR	Euro
GDP	Gross Domestic Product
GIS	Geographic Information System
GOA	Government of Armenia
IDA	International Development Association
IFI	International financial institution
KPI	Key Performance Indicator
KfW	*Kreditanstalt fur Wiederaufbau*
MDP	Municipal Development Project
MWWP	Municipal Water and Wastewater Project
NIF	Neighborhood Infrastructure Fund
NRW	Non-Revenue Water
O&M	Operations and Maintenance
OCC	Operation Control Center
PMU	Project Monitoring Unit
PPIAF	Public-Private Infrastructure Advisory Facility
PPP	Public-Private Partnerships
PRSC	Public Services Regulatory Commission
RA	Republic of Armenia
SCWE	State Committee for Water Economy
TMP	Total Management Plan
UNDP	United Nations Development Programme
USD	United States Dollar
VAT	Value Added Tax
WSC	Water and Sewerage Company
WWS	Water and wastewater services
WWTP	Wastewater treatment plant
YWSC	Yerevan Water and Sewerage Company
YWWP	Yerevan Water and Wastewater Project

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EXECUTIVE SUMMARY

Armenia's sixteen years of experience with public-private partnerships (PPPs) in the water sector is a rich illustration of how partnering with private operators can be done in a well-thought out manner to improve water services in a developing country. The Government took a phased and cautious approach to the PPP reform, gradually increasing the geographical scope of the PPPs as well as the level of transfer of risks to private operators. It began in 2000 with a 5-year management contract in the capital city Yerevan, and then transitioned in 2006 to a more complex 10-year lease contract in Yerevan, while initiating additional management contracts to manage water services in secondary cities and towns in the rest of the country.

Water Services Challenges before PPPs

The decade following independence from Soviet rule in 1991 saw the introduction of liberal, market-oriented policies but the needs of the water sector remained largely unaddressed. By 2000, 60 percent of the water mains and connections in Yerevan were 30 to 40 years old and in very bad shape, a situation exacerbated in Yerevan and Shirak by the impact of the devastating 1988 earthquake on the distribution network. The average hours of daily water supply in 1998 was 6 hours in most parts of the country, including Yerevan, and breakdowns were common. Tariffs covered only 30 percent of operations and maintenance costs and central budget allocations had to fill the gap. There were also administrative and managerial gaps within the water utilities, namely Yerevan Water and Sewerage Enterprise (YWSE)[1], Armenia State Water Company (ASWC)[2], and municipal utilities in the regions of Nor Akunq, Shirak and Lori. Recognizing the challenges and limitations of public service provision, the government of Armenia decided to introduce private sector participation, starting initially with Yerevan in 2000.

Creating an Enabling Environment for Water PPPs

Throughout the reform, the Government exerted significant effort with donors' support to create a conducive environment for PPPs. The National Assembly passed some twenty new legal acts regarding water metering, billing, revenue collection, taxation and other financial matters to support the PPP program and the move towards financial sustainability and operational efficiency. Another important step was the creation of the State Committee for Water Economy (SCWE) to serve as the central body for water sector management. In addition, the Government established Project Monitoring Units (PMU) to monitor the implementation of projects and particularly, to monitor the performance of PPP contracts.

Careful PPP Contract Preparation and Tendering

The Government, together with its development partners, spent considerable effort in preparing for the PPP contract and sought external support as needed. In both the Yerevan and AWSC management contracts, the preparation time took two years. Tendering for all contracts was satisfactory. There was significant similarity in the terms across all the contracts, suggesting a cross-fertilization of lessons learned with each successive contract. The contracts all included clauses for amendments and extensions, which

[1] Subsequently renamed the Yerevan Water and Sewerage Company (YWSC)
[2] Subsequently renamed as the Armenia Water and Sewerage Company (AWSC)

were applied in all cases. In addition, all contracts obliged the private partner to implement donor-funded capital expenditure (capex) programs. All the management contracts included a fixed fee for the contractor and a variable fee based on incentive payments (bonuses and penalties). While the number and type of KPIs differed (93 for the Yerevan management contract, 10 for the regional utilities), there were a few core indicators across all contracts: duration of water supply; collection of fees; and installation of water meters. Staff productivity, water losses and electricity consumption were also common indicators.

Implementation of the Capex Program under the PPPs

Under the successive management contracts and the Yerevan lease contracts, financing for capital works was carried out by the Government of Armenia, through loan programs with its development partners. **An important feature of the various PPP schemes is that the private operators were left with significant flexibility and control in the execution of the capital works**, under the supervision of SCWE - an arrangement which facilitated the prompt implementation of the investment programs. Overall, the amount of capex spent on a per capita basis was quite different between the various water PPPs: ranging from about USD 5-6 per year for the Yerevan management contract and lease, to USD 24 and USD 30 per year for the management contracts for AWSC and for the three regional utilities.

The Successive Water PPPs have Achieved Strong Improvements in Services Quality and Efficiency

The series of water PPP contracts across the country, implemented over a 16-year period, led to major improvements in operational performance, service quality and the financial situation of the water sector. The quality of water services improved considerably, with continuous 24/7 water supply achieved in most of Yerevan by 2015, and a significant increase in the average number of service hours in secondary cities and towns. These improvements were essential to get water systems across the country out of the vicious circle of intermittent supply, accelerated deterioration of networks, dubious quality of drinking water, poor customer satisfaction and low willingness to pay for water bills. In addition, improved customer service and modern commercial practices were introduced and billing based on actual metered consumption became widespread.

Operational efficiency was also significantly enhanced, especially through **remarkable improvements in energy efficiency, bills collection** and **labor productivity** – although there was little or no improvement in the reduction of water losses as measured by the Non-Revenue Water (NRW) indicator. The reasons for this lack of improvement in NRW are not due to lack of performance by the private operators, but to: (i) the direct impact of reducing intermittent supply (which increases the average pressure of the network), (ii) insufficient funds available to rehabilitate dilapidated networks, and (iii) plentiful and cheap water resources, making the need for efforts in leakage reduction less compelling than in other countries. Operational improvements were carried out in parallel with gradual tariff increases, approved by the Government in careful sequence so as to broadly match the improvement of services quality and reduce the risk of public opposition. By 2015, the Armenian population enjoyed a level of water tariff well below that of neighboring countries – ranging from USD 0.35 to 0.45 per m3 – in exchange for a much better level of services. Opinion polls have shown that the population widely approved of the water PPPs, and that a large majority (70%) would oppose a return to public management of water services.

Progress was also made towards increasing the financial viability of the water sector, especially in the capital Yerevan. Water services in Yerevan, under a lease contract from 2006 to 2016, became financially self-sufficient with tariffs covering all O&M costs and debt services for investment (financed by the Government) by 2011. However, tariffs were still below full cost recovery in the rest of the country - i.e. the areas served by the two management contracts for AWSC and the 3 regional utilities of Shirak, Lori and Nor Akunq – when these two contracts ended in 2016.

Looking forward: the new 15-year National Lease that started in 2017

Building on these achievements, the government decided to move to the next step in PPP reform, and signed in November 2016 a 15-year national lease contract with one single private operator. The new national lease contract, which began in January 2017, covers all areas previously served by the various PPPs (i.e. Yerevan, secondary cities and towns across the country and some villages), equivalent to about 2.2 million people or two-thirds of the population. The goal of this new water PPP is to consolidate the positive results achieved under the first 16 years, expanding continuous 24/7 water supply to all cities and towns across the country and allowing for more efficiency gains with scale economies. In practice, the new national lease contract is introducing a cross-subsidy between Yerevan and the rest of the country, with the establishment of a **single national water and sanitation tariff set at about USD 0.43 per m3**. The private operator is liable to pay the Government a total lease fee of about USD 190 million over the 15 years of the national lease, which has been set so as to fully cover the debt service of the water and sanitation sector (capex financed by the government) by the 10th year of the contract – when the water sector in Armenia should become fully self-financed through tariff revenues.

The year 2017 represents therefore a major turning point for water PPP reforms in Armenia, with the end of the lease contract in Yerevan and the two management contracts covering the rest of the country (AWSC and the three regional utilities), and the start of the new 15-year national lease contract covering all areas previously served under the first generation of PPPs. At this pivotal point, the World Bank's Water Global Practice, with support from PPIAF, undertook this study with the goal of documenting the many lessons learned from Armenia's rich experience with water PPPs, for the benefit of other developing countries considering PPP as an option to improve their water services.

INTRODUCTION

Overview

Armenia's sixteen years of experience with public-private partnerships (PPPs) in the water sector is a rich illustration of how partnering with private operators can be done in a strategic manner to improve water services in a developing country. **The Government took a phased and cautious approach to the PPP reform**, gradually increasing the geographical scope of the PPPs as well as the level of transfer of risks to private operators while learning lessons as it moved forward. The sequence of PPPs was as follows:

- Armenia's experience with water PPPs began in 2000 with a **5-year management contract in the capital city Yerevan, which had a service area of about 1.2 million people;**
- **In 2004, a management contract was put in place for the Armenia Water and Sewerage Company (AWSC)**, a utility that covered almost 320 cities, 37 urban centers and 283 rural communities with a total population of about 620,000 spread through most of the secondary cities, towns and villages in the rest of the country;
- **In 2006, the management contract in Yerevan was replaced by a 10-year lease contract** whereby a private operator took all commercial and operating risks and was remunerated through collection of tariff revenues;
- **In 2009, another management contract was put in place for the 3 regional utilities** that were still under public management. This contract centered around the cities of Lori, Shirak and Nor Akunq (about 330,000 people).

These four contracts represent what can be called the first generation of water PPPs – since the Yerevan lease contract and the two management contracts for AWSC and the three regional utilities all ended at the same time in 2016. Figure 1 illustrates the chronology and key data from this first generation of water PPPs undertaken in Armenia from 2000 to 2016. Figure 2 shows the geographical scope of the PPPs.

Fig 1. Overview of Water PPPs in Armenia

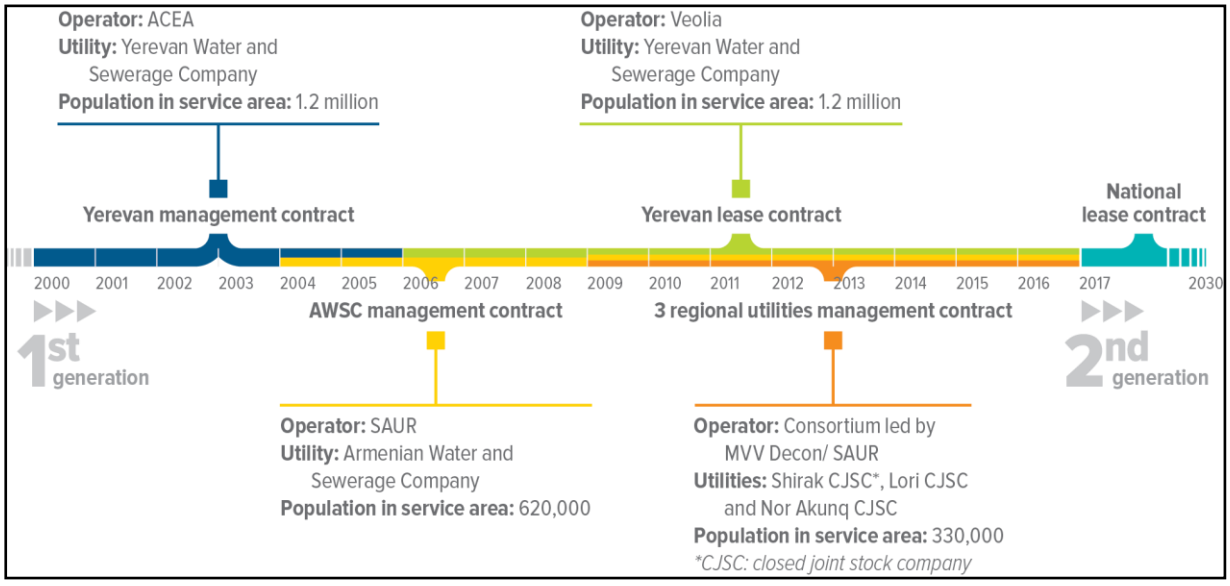
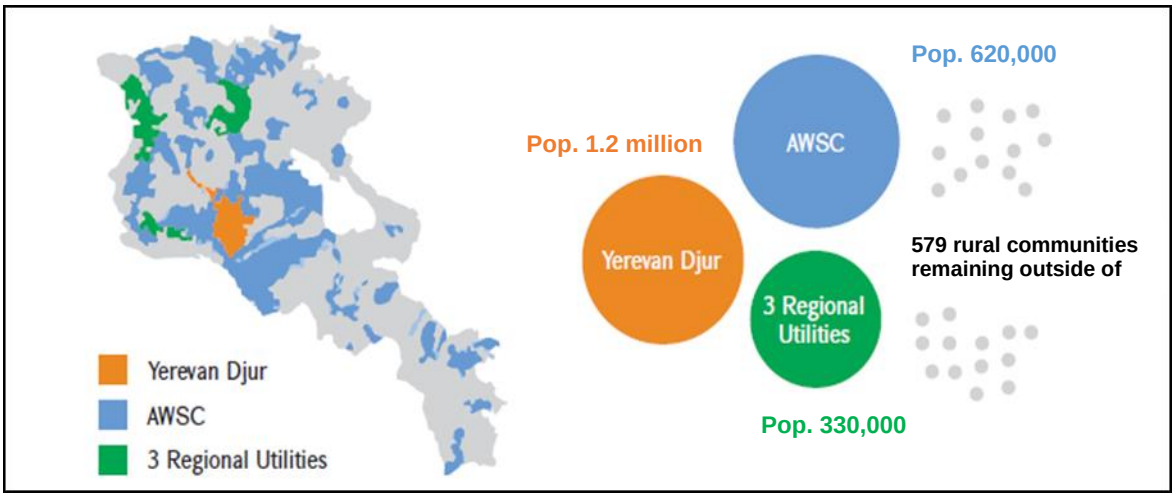


Figure 2. Water and Sanitation Service Providers in Armenia



Structure of the Report

Following this short introduction, the report is organized into 8 separate but closely related sections.

The first Section provides an overview of the context leading up to the start of water PPPs in Armenia, starting with the dire situation of water services before the introduction of private operators, and followed by a discussion of the decision process that led the Government to embark on a PPP reform. It also provides a brief outline of steps taken to create a favorable environment for water PPPs under the first management contract in Yerevan (which created an enabling environment for subsequent contracts).

The report then takes a sequential approach to analyzing each PPP contract, with **each of the four water PPP contracts that were implemented in Armenia between 2000 and 2016 analyzed in detail in a specific section**, starting with the Yerevan management contract in 2000 (Section 2), and then followed by the Yerevan lease contract in 2006 (Section 3), the AWSC management contract in 2004 (Section 4) and the three regional utilities management contract in 2009 (Section 5). To facilitate comparison, the report adopts the same analytical structure for each contract, reviewing successively: the situation at the start of each contract, the tendering process and key contract design issues, the most noteworthy elements during implementation, the main results achieved and the most relevant lessons learned.

Section 6 brings the analysis of all the contract together and summarizes the key lessons learned from the first 16 years of water PPP reform in Armenia. This section aims to capture the main messages and experiences from the four water PPP contracts. **It may be the most important section in the report**, and the reader who is mainly interested in the main lessons from the Armenia water PPP reform can focus solely on this section if so desired.

Section 7 briefly presents the new national lease contract that is underway since January 2017. This new PPP contract represents in a way the culmination of the first 16 years of PPP reforms. Its design incorporates many lessons from the previous contracts. It is an "enhanced lease" arrangement whereby the private sector is expected to finance 12.5 percent of expected investment needs through its collected

tariff revenues, and NRW was introduced for the first time in the water PPPs in Armenia as a performance indicator subject to penalties for not meeting a contractual schedule of targets.

Finally, the report concludes with **Section 8, which discuss the key policy issues that will need to be addressed in the future as Armenia pursues its water PPP reform**. These issues include the importance of carrying out the planned infrastructure investment – to be mostly financed by the Government under the terms of the lease contract - efficiently and in full, how to expand wastewater services in a viable manner, and most importantly, how to gradually incorporate into the benefits of the PPP reform the population of about 650,000 people living in remote villages and settlements currently without proper water services and that was not covered under the first generation of PPPs.

1. WATER AND SERVICES AT THE ONSET OF PPP REFORMS

Context of Water and Wastewater Services in Armenia before PPPs

In the late 1990s, the country's water infrastructure was highly dilapidated. Most of it had been constructed during the Soviet era, and typically built with excess capacity and little regard for economic or operational efficiency (especially energy efficiency). Due to inadequate maintenance, these facilities seriously deteriorated over time. The state of water infrastructure worsened after Armenia attained its independence in 1991, as the country was facing multiple pressing challenges and competing sector priorities. By 2000, 60 percent of the water mains and connections in Yerevan were more than 30 years old and in need of rehabilitation. Even though 20 wastewater treatment stations had been built before 1990, they had gradually been abandoned and the collected wastewater was disposed untreated into rivers and other receiving bodies. Figures 3 and 4 illustrate the poor state of the infrastructure.

A devastating earthquake in 1988 in Yerevan had also exacerbated an already fragile water system. In addition to taking a dramatic toll on human life (about 45,000 people died), it damaged 4,574 kilometers of water supply network and 2,094 kilometers of sewerage network. The volume of water supplied to customers felt by more than 42 percent (down to 40 million m3). It was estimated that the level of leakage in the system increased by about 25 percentage points as a direct consequence of the earthquake.

Fig. 3 Masis Pumping Station

Fig. 4 Distribution Network in Village

Credit: Patrick Lorin; photos from 2004

The average hours of daily water supply stood at only 6 hours in 1998 in Yerevan, and even less in most of the rest of the country. Variations in pressure within apartment buildings meant that upper floors sometimes did not receive water in the summer months and received only one or two hours a day in the wintertime, if at all – creating much hardship for the population and especially the poor who had no access to coping mechanisms such as water tanks and private water trucks. The problem of intermittent supply became of such magnitude that a Financial Times advisory warned business travelers that while hot water was available in Yerevan's main international hotel, the hours of supply were very few.

Water service companies throughout Armenia were on the verge of bankruptcy. Cost recovery was extremely weak during this period, as tariffs covered only about 30 percent of operations and maintenance (O&M) costs, and central budget allocations had to fill the gap. A huge unpaid debt had been accrued with the power companies. In 2002, the government's subsidies to the water sector amounted to 3.4 percent of total budget expenditure. This was due to a combination of inefficient operation, low tariffs and poor collection discipline. Moreover, most customers were billed based on estimates,[3] resulting in rampant non-payment of bills as customers found it unfair that they had to pay regardless of how much water they actually consumed. By 1999, payment discipline had largely disappeared: only 15 percent of domestic consumers - and almost no government institutions - paid their water bills.[4]

The macroeconomic situation of the country was also quite dire, making continuous subsidization of the water sector unsustainable. In the early 1990s, GDP fell by almost 50 percent, budget expenditures shrank by a factor of three and population incomes halved, reflecting the country's difficult transition to a market economy. In this context, there was not enough revenue available anymore from either the general budget or consumers to cover water operational costs, let alone rehabilitation or expansion. In addition, an energy crisis had led to a sharp increase in electricity prices, putting the water sector under additional financial strain.

Another challenge was the disastrous management and operations of public water companies. The two main water supply companies, Yerevan Water Company (under the municipality of Yerevan, about 1.2 million people served) and Armenia Water Company (AWSC, under the Ministry of Urban Development, about 620,000 people served across the country), supplied most of the urban areas in Armenia. However, they were chronically under-funded with poor operating practices and dismal customer service. Overstaffing was rampant, with poorly motivated personnel and low salaries. The best trained employees typically moved to the private sector or left to go abroad. The three other regional water utilities, partly controlled by local authorities and serving the areas around the cities of Shirak, Lori and Nor Akunq (about 330,000 people in total) were in no better situation. Many small rural settlements (about 650,000 people) were not even served by these public utilities and relied on standpipes or natural water sources.

The Government's decision to embark on water PPP reforms

By the late 1990s, there was a growing realization within government that public management of water services could not address the daunting challenges of the sector alone. While donor financing could help meet some of the infrastructure investment needs, it was not enough to address the range of challenges in the sector, namely huge infrastructure backlog, chronic operational inefficiencies, weak utility management, poor financial performance and bad service quality. Partnering with the private sector seemed like a viable option to address capacity and efficiency gaps. This was at a time when many other

[3] In Yerevan, fewer than 100 blocks out of some 4,230 covering 1.25 percent of the total population of 1.2 million were fitted with block meters, making it difficult to measure water consumption accurately. Bills were set based on normative per-capita consumption of 200 liters per registered inhabitant for non-metered customers.

[4] Collections from other customers was much better, at 90 percent of billed volumes.

developing countries across all continents were also experimenting with water PPPs as a way to turn around their failing water services.

In the context of the preparation of a new World Bank project (the Municipal Development Program, MDP), the Government considered the option of bringing on board an international private operator under a management contract for Yerevan, as well as possibly ASWC. Wanting to better understand what this option would entail, the Government requested the World Bank to undertake a study tour of private sector experience in water service provision in the region. Stakeholders interviewed during this study insisted that **the study tour proved pivotal for catalyzing the Government's decision to embark on water PPP reforms**. The tour was organized in March 1998 with a delegation from Armenia visiting Hungary (leases in Budapest), Poland (lease in Gdansk) and France (management and *affermage*/lease contracts). The country visits provided concrete examples of water PPPs where the private sector concentrated on improving service quality and operational efficiency, while the government retained responsibility for investment. Upon returning to Armenia, the head of the delegation – who became the Chairman of the SCWE – reported the delegation's positive assessment to the country's President. Discussions within the Government were then initiated on the best water PPP approach to adopt for Armenia. A management contract model was initially chosen as it would allow for a cautious stepped approach, given the considerable risks for private operators entering the Armenian water sector at that time.

A sequenced approach to water PPPs was part of the design of sector reform from the onset. From the beginning, the Government intended to expand PPPs beyond the first management contract in Yerevan – but it was also keen to move in a cautious and progressive manner. While there was recognition of the inherent value of the lease contract approach – with more responsibilities passed to the private sector and better incentives for performance - the Government felt that it would be too risky as a first PPP. Considering the dire state of the water services in Yerevan in the late 1990s (notably extremely low tariff levels and collection rates), a management contract was seen as a first, necessary step before possibly moving to a lease contract at a later stage. Discussions for a management contract in other secondary cities and towns (AWSC) also began in 2000 but this second contract started only four years later.

Putting in place a supportive PPP environment

Major structural changes were made to the water companies operating in Armenia. After a national decentralization reform in 1996, water services had been transferred to newly established local authorities. However, when it became apparent that these authorities lacked the necessary organizational and financial capacities, the Government reversed course. In 2000, water sector management was centralized again under a single body, the State Committee for Water Economy (SCWE).[5] SCWE became the asset owner and 100 percent shareholder of AWSC and Yerevan Water and Sewerage Company (YWSC). The government restructured their debts by splitting the companies into two separate entities – one part became a "shell company" and the other was reconstituted as a new water supply company with a clean balance sheet. The decentralization of water services was partly maintained for the areas around

[5] SCWE functioned initially as an adjunct body to the Government. Later, it operated under the Ministry of Territorial Administration and currently operates under the Ministry of Energy Infrastructures and Natural Resources.

the cities of Shirak, Lori and Nor Akunq, where regional water utilities were established with 51 percent held by the central government and the rest by local authorities.

The National Assembly passed some twenty new legal acts as part of the water PPP reform. The laws were related to water metering, billing, revenue collection, taxation and other financial matters. Starting in 1999, it passed Decision No. 149 requiring the installation of water meters for consumers, and allowing YWSC to cut off water supply for public enterprises who did not pay their bills, a decision that proved to be important later in enforcing payment discipline among consumers generally. In 2002, a Law on Forgiveness of Customer Debts was passed which allowed old debt to be canceled in exchange for accepting the installation of meters. In 2002, a new Water Code defined the framework of private sector participation in water services and in 2003 the national regulator was established (Box 1). In 2005, the Law on Fundamental Provisions of the National Water Policy came into effect, outlining the strategic use and protection of water resources and systems. A year later, the National Water Program in 2006 was developed, addressing water resource use and sustainability measures to meet the needs of the population and the economy.

Box 1: Regulating water PPPs: new Water Code (2002) and national regulator (2003)

The new Water Code, which was passed in 2002 i.e. two years after the start of the first management contract in Yerevan, excluded the outright privatization of water systems (i.e. private ownership of infrastructure) but explicitly allowed for various forms of PPPs, namely service contracts, management contracts, leases and concessions. The Natural Monopolies Regulatory Commission, subsequently renamed the Public Services Regulatory Commission (PRSC), was created in 2003, with responsibility for issuing permits and approving tariffs. Its other functions included developing market rules and regulations; setting service quality requirements and reviewing investment programs presented by license holders.

The Water Code defined the general principles for water sector governance in Armenia, including tariff policy, with two approaches to tariff setting. Under the standard approach, utilities had to present requests for tariff adjustments through a tariff application to the regulator according to the established procedure. This approach was to be applied for the utilities that remained under public management (initially in Shirak, Lori and Nor Akunq) and for those moving to management contracts (since the remuneration of the private operator was not linked to the tariff level). The second approach to tariff setting was to be applied in the case of lease contracts, whereby tariffs could be adopted based on the result of a tender. The second approach was applied for the first time during the tender of the Yerevan lease contract in 2005.

2. YEREVAN MANAGEMENT CONTRACT: 2000 – 2005

Water Sector Context in Yerevan before the Management Contract

As already mentioned, **water services suffered greatly during the period of transition to a market economy in the 1990s**. The water and sewerage infrastructure in Yerevan was inefficient and seriously deteriorated, the public utility YWSC was in a weak financial condition and the quality of services was poor. Most of the city's population received water only twice a day for a mere two hours, and some districts sometimes did not receive water at all for a given day. A study done in 2003 found that approximately 240,000 households were relying on communal taps and had to carry back to their homes about 15 liters per capita per day. Average revenue collection, which had been about 47 percent in 1997, had dropped to a low 20 percent by 2000.

Tendering and Contract Terms

Tendering Process: the preparation of the Yerevan management contract took two years, allowing the government to carry out in parallel the first reforms outlined above, to consult stakeholders – including soliciting donor support – and define its expectations. Following a competitive bidding process that involved three qualified bidders, the Italian utility ACEA (the private operator for water and electricity services in Rome) won the contract. A 4-year management contract was signed in February 2000, and ACEA took over the day-to-day operations and maintenance of water services in Yerevan in June 2000.

Terms of the contract: The contract was initially scheduled for completion on April 30, 2004 but was extended by another year until April 30, 2005. Most of the remuneration was based on a fixed fee, so as to reduce the operator's financial risk, but a variable fee was also included to incentivize performance. The contract was quite specific with regards to the scope of work, with a long and detailed list of activities to be carried out by the private operator. These activities included operational tasks e.g. carrying out a leak detection program, supervising meter installation and repairs, preparing a digitized mapping system for water networks, enhancing the energy efficiency of pumps and other electrical equipment, and improving chlorination of water. Commercially, the contractor had to implement a program to collect accounts receivables, identify illegal connections, and implement computerized administrative systems for billing. Other deliverables included establishing a customer service system, carrying out a public information campaign, implementing a management training program for YWSC staff, and developing standard operating procedures and various manuals to improve the utility's administrative systems.

Performance monitoring: The contract included as many as 93 key performance indicators (KPIs), a very large number that was typical of the management contracts designed in the late 1990s. However, only a few were linked to bonuses, and none were associated with penalties (Box 2). The four KPIs linked to bonuses were: i) continuity of water supply; ii) electricity usage; iii) leak detection survey[6] and iv) installation of meters[7]. While the contract was largely input based, the Government deemed the use of

[6] Only for the Years 1 to 3 of the contract

[7] In the first year of the contract, the indicator was for installing production meters; in the second to fourth years of the contract, the indicator was for installing customers' meters.

bonuses (without penalties) essential because the partnership was new and therefore entailed higher risks for the private partner, so providing some financial upside would generate more competition for the tender. The operator had to submit regular reports to YWSC including Base Year Data, a Human Resources Plan, Procurement Guidelines and an Annual Operating Investment Fund Plan.

The Yerevan management contract was mostly funded by the World Bank. The World Bank provided USD 28 million under the new Municipal Development Project (MDP) (1998 to 2006), a complete financing package for both the preparation and the implementation of the management contract. This loan provided funding for the investment program and paid for the operator's fees and bonuses as well as technical assistance and auditing of the operator's performance. The investment portion included both funding for capital investments for the rehabilitation of water systems (as determined jointly by YWSC and the contractor), and an Operating Investment Fund to support essential short-term expenditures (with the private operator in charge of managing the fund).

Box 2. Incentive Compensation in the Yerevan Management Contract

The government paid the private operator a fixed fee of USD 5 million for a four-year period, which formed the basis of the bidding process. It capped the maximum performance payment at USD1.5 million over the term of the contract and set a ceiling of USD 375.000 in any given year. The terms for this "maximum annual incentive compensation" were quite strict. An Incentive Compensation Chart provided performance ratings from "excellent" to "poor", with weights for the different performance indicators. For example, continuity of water supply had a 0.08 weight, whereas electricity use had a 0.05 weight. If the operator failed to achieve an excellent rating, they were obliged to make up the shortfall in the following contract year. If they achieved a poor rating, they were not eligible to receive an incentive compensation in the following year. The operator received USD 1.41 million in incentive payments, 94 percent of the maximum possible.

There was no retrenchment of staff under the Yerevan management contract. As part of the contract deal, YWSC transferred close to 1,800 staff to the management company. However, YWSC continued to pay the salaries of the transferred staff. At the end of the ACEA contract, the staff were transferred to Veolia, the operator for the new Yerevan lease contract, which began in 2006.

Implementation of the Yerevan Management Contract

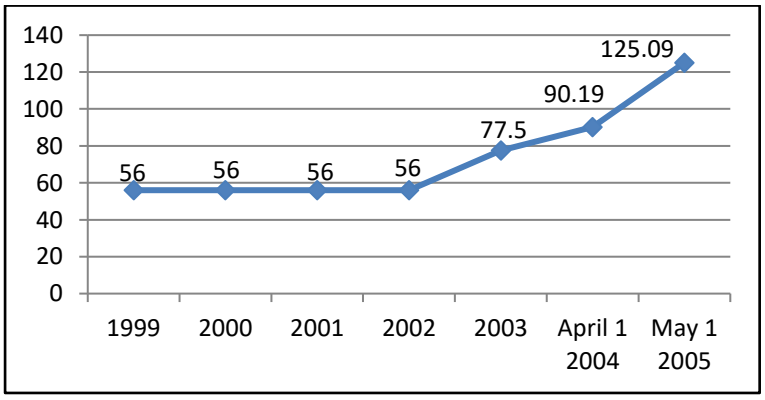
The private operator started rehabilitating the Yerevan water distribution network through sectorization. This approach involved dividing water distribution and pressure zones into sectors for which bulk water meters and, as required, pressure-regulating valves were installed to control incoming water flows, manage water pressure and reduce leakage in the distribution system. Sectorization also enabled better long term planning for rehabilitation/replacement of water mains. The contractor spent about 61 percent of the capital investment fund on sectorization. Under the project, about 50 percent of the YWSC service area was sectorized.[8] Another priority of the contractor was to install block water meters in apartment buildings. In addition, it retrofitted internal plumbing systems in many buildings and did partial

[8] The rest of the network sectorization was completed under the Yerevan lease contract, with a different operator.

repairs. The Japanese Social Development Fund provided subsidies to defray the cost of installing retail water meters for poor families.

As for commercial aspects, stagnant tariffs and weak revenue collection undermined YWSC's financial position. In 1999, before the beginning of the management contract, tariffs were very low, at 56 AMD (USD 0.10) per cubic meter. Tariffs stayed flat until 2002 because the government preferred to see improvement in bill collections and service quality first before increasing tariffs. At the same time, revenue collection stayed well below the 35 percent target set in the contract, mainly because it took some time for the metering program to reach a critical mass. Moreover, even though the operator launched a communication strategy to familiarize customers with the concept of payment for actual use, such an endeavor required behavioral change that took time to materialize. Operating expenses did not decrease as much as expected, leading to quite disappointing financial results on the whole. As a result, YWSC continued to face a cash shortfall, leading to some late payments to staff and delays in implementing maintenance and rehabilitation of the water system. The situation was only redressed at the end of the management contract, when tariffs steadily increased to reach USD 0.27 per cubic meter (an increase of 123 per cent) by 2005, thus allowing a marginal improvement in YWSC's financial situation (Figure 5).

Figure 5. Yerevan Water Supply Company Tariff, 1999 to 2005, AMD/m3



Another implementation challenge was that initially counterpart funding from the government of Armenia did not materialize as planned. In 2001, the second year of the contract, the Government budgeted USD158,000 instead of USD470,000 for capital investment, as counterpart funding for the World Bank financed MDP's Operating Investment Fund. As this funding was essential for covering the cost of procurement, investment and system improvements, the delay put the capex program at risk. The private operator and the Government eventually agreed on a financing plan to secure government funding at the beginning of each year for both the Operating Investment Fund and the Capital Investment Program. With the many difficulties encountered during the first years, the relationship between the Government and the private operator was always somewhat strained.

The private operator undertook capacity building of YWSC staff. In early 2002, ACEA launched a major reorganization of YWSC, hired new Armenian directors and branch managers and increased salaries. It also conducted multiple trainings for utility managers on topics such as management of personnel,

financial systems, budgeting and planning. The contractor provided hardware, software and licenses at no cost. All these measures were meant to build the administrative and technical capacity of the utility.

Although customer service improvement was not a priority under the Yerevan management contract, given the more urgent priority on infrastructure improvements, the private operator launched a customer service program, which entailed installing new software for billing and collections and delegating some of its operation to YWSC branch offices. The contractor also initiated a public information campaign to explain the nature of private management of the utility.

Results and Key Factors

YWSC registered tangible improvements in its operational and financial performance under the management contract (Table 1). The most concrete benefit for the population was a major reduction in intermittent supply and a quadrupling of the average number of hours of water services. Customers were able to save on coping costs such as private water trucks, individual pumping and storage, and time spent in fetching water. Also, most customers became billed based on actual metered consumption, as opposed to being billed on estimates as before.

Table 1. Main technical and economic indicators of Yerevan Water and Sewerage CJSC during the management contract

Indicator	Base year (2000)	Management contract expiration Year (2005)	Notes
Water Supply duration, hour/ day	4-6	18.4	The contract intended 18 hours / day.
Energy consumption, mln. kW h	240.3	124.2	Decreased by 48.3 per cent, against 25 per cent target.
Number of meters installed	3 856	379 580	Water meters installed for 90 percent of customers.
Metered water consumption volume, mln. cubic meters	8.5	48.6	
Share of metered water in water consumption volume, percent	7%	63.4%	The contract target was 25%
Total water intake from water sources, mln. cubic meters	436.2	358.2	Decreased by 78 million cubic meters, or 18%
Gravity water intake, mln. cubic meters	158.5	202.6	Increased by 44.1 million cubic meters, or 28%
Collected fees, million AMD	1 349.9 (USD 2.5M)	4 434.9 (USD 9.7M)	
Fee collection rate	20.9%	79.2%	The collected fees up four-fold from 20.9% to 79.2%.

One of the strongest improvements was the major reduction in electricity consumption and electricity costs. In the first year of the contract alone, there was a 14 per cent decrease in electricity consumption,

equivalent to USD60,000 in monthly savings. The hydraulic structure of the network was gradually rationalized to favor cheaper gravity-based intakes and three pumping stations were shut down to enhance operational efficiency. As a result, energy consumption decreased by almost half, from 240.3 million kWh in 2000 to 124.2 million kWh in 2005.

Despite the technical improvements achieved under the contract, YWSC's financial results remained unsatisfactory. The company continued to operate at a significant loss, accumulating nearly AMD 20.9 billion (USD37.6 million) in losses during the management contract period (Table 2). The main reason is that costs more than doubled while revenue increased but not as much.

The Yerevan management contract also failed to make a dent in the high levels of non-revenue water (NRW). The contract included an activity on enhancing leak detection and repair, with a target of 4,000 kilometers by the fourth year. While NRW decreased in terms of volume of water lost by 17 percent, it did not decrease as a percentage of water production. The main reason for the lack of progress was twofold: insufficient funding for the rehabilitation of the dilapidated distribution system in Yerevan, and the fact that the improvement in service continuity had a negative concomitant impact on water losses as the network was under pressure (and therefore leaking) for many more hours than before. Moreover, from a monitoring point of view, the base year estimate for "unaccounted for water" was calculated using unmetered consumption and was therefore misleading. The performance targets for NRW that were introduced in the contract were clearly not realistic given these circumstances.

Table 2. Financial results of Yerevan Water and Sewerage during the management contract

	2001	2002	2003	2004***	2005
Total current revenue, mln. AMD	**6,059.4**	**5,976.0**	**4,003.6**	**5,026.1**	**5,350.9**
Revenues from providing of services (including VAT), mln AMD*	6,059.4	5,976.0	4,003.6	5,026.1	5,350.9
Collection rate, %**	26.7%	45.1%	75.0%	83.3%	85.3%
Collection, mln AMD	1,617.9	2,695.2	3,002.7	4,186.8	4,564.3
Total current expenses, mln AMD	**6,780.1**	**7,651.1**	**8,565.6**	**7,628.0**	**9,251.7**
Salary and social security payments, mln AMD**	456.1	975.6	1,905.8	1,867.7	2,418.0
Electricity, mln AMD**	3,729.0	3,877.5	3,334.2	2,444.8	1,800.0
Materials, mln AMD**	1,172.0	352.0	439.6	432.5	845.0
Other current expenses, mln AMD**	1,423.0	2,446.0	2,886.0	2,882.9	4,188.7
Financial gap, mln AMD	**-720.7**	**-1,675.1**	**-4,562.0**	**-2,601.9**	**-3,900.8**
Financial gap (collection), mln AMD	**-5,162.2**	**-4,955.9**	**-5,562.9**	**-3,441.2**	**-4,687.4**
Subsidy for current activity, mln AMD**	**277.0**	**270.0**	**2,063.0**	**1,008.0**	**1,202.3**
Financial gap (collection) after subsidy, mln AMD	**-4,885.2**	**-4,685.9**	**-3,499.9**	**-2,433.2**	**-3,485.1**

*) Data source: the financial statements of Yerevan Water and Sewerage CJSC

**) Data is based on the calculations of financial flows of Yerevan Water and Sewerage CJSC

***) Expenses for 2004 have been assessed based on I-III quarters actual data

Overall, the private operator earned USD1.41 million in incentive payments (bonuses) over the 5-year management contract, in addition to the fixed management fee of USD4.8 million. When the contract ended in April 30, 2005, the operator continued in an advisory capacity for two months until June 2005. The aim was to ensure continuity until the new lease operator for Yerevan took over. Key staff of the management contract, including the former Managing Director, were hired as individual consultants to serve in operational positions.

Main Messages and Lessons Learned

As PPP was a new modality for the country, the government had decided to focus on a few key priority areas. The first was reducing intermittent supply while implementing demand-side management, particularly metering, debt forgiveness and bill enforcement. Managing demand was a prerequisite for further capital investment because without a good basis for monitoring and collecting revenues, there would not be enough financing for investment. Secondly, the government decided to prioritize water supply and to address sanitation later. The lesson learned is that for a management contract of limited scale and size, it is better to define a few essential activities that the private contractor can deliver quickly and efficiently. The gains from this experience laid the ground for further technical and operational improvements in future PPP contracts.

The introduction of a private operator proved an important driver of public sector reforms. A major contribution of the private sector was not only the improvements it made on technical and financial performance, but also the impetus it brought for making difficult political decisions that could otherwise be easy to defer under public service provision. The decision to turn to private sector operation brought issues to the fore, such as customer debts, that would otherwise have festered unattended. Public management also increased expectations and scrutiny for water services, at a time when many citizens had resigned themselves to sub-optimal results under public management.

The government made efforts to act as an equal partner (despite a sometime shaky relationship) and took concrete actions to create an enabling environment for the PPP – instead of trying to push all responsibilities to the private operator. This attitude stands in sharp contrast to the many management contracts that were being implemented during the same period in other developing countries around the world, where accumulated frustrations with the many implementation challenges led to a return to public management. The continuous and welcomed support of donors as “honest brokers” was also important for supporting the partnership between the private and public partners.

Another clear lesson is that performance indicators should be limited and based on good asset inventory. The initial poor state of the infrastructure system made it difficult to set appropriate targets, such as for reducing NRW, which resulted in contractual targets not being achieved. In hindsight, 93 KPIs was too many and set unreasonable expectations about what the private contractor could deliver in a limited amount of time and with limited transfer of responsibilities. The spirit of the Yerevan management contract was very much “input-based”, as most of the KPIs were to develop standard operating procedures, O&M plans and other management plans. It might have been better to focus more the private operator on key performance issues, rather than preparing reports.

3. YEREVAN LEASE CONTRACT: 2006 - 2016

Water Sector Context in Yerevan Leading up to the Lease Contract

The relative success of the Yerevan management contract emboldened the government to expand private sector involvement in Yerevan and switch to a lease contract. This was, in many respects, a remarkable move. On face value, while the Yerevan management contract did achieve several notable improvements in performance, it did not achieve all the target KPIs in the contract, and failed to deliver the hoped-for improvement in the financial situation of the Yerevan water utility. Furthermore, SWCE acknowledged that the daily relationship with the private operator was not always an easy one, and that ensuring a proper interaction and interface required considerable attention.

Overall, the Yerevan experience in the early 2000s was not radically different from the outcome of other management contracts that were piloted during this period in developing countries around the world. **All of these other contracts ended with a return to public management**, as the respective governments abandoned the PPP route.[9] Yet in Armenia, the government took a radically different view. Instead of considering that with the Yerevan management contract the "glass was half empty" and PPP had failed to meet expectations, it took the view that the "glass was half full" and felt encouraged to keep on the PPP road. Recognizing the inherent limitations of a management contract – with only limited transfer of risks and responsibilities to the private operator under a relatively short duration – the Government did not choose to end the PPP experiment but instead decided to take it to a new level, shifting in 2006 to a 10-year lease contract in Yerevan.

The main goal of the Yerevan lease was to deepen the achievements under the YWSC management contract and make them sustainable, with the operator assuming more operational and commercial risks. The Government remained responsible for providing the financing of the rehabilitation program – and undertaking overall contract supervision - with continued donor support to finance capital works. The service area of the new lease contract covered the city of Yerevan and 30 surrounding villages.

Tendering and Contract Terms

A competitive tendering process began in 2005 and resulted in the award of the contract to French operator *Compagnie Générale des Eaux* (CGE, now Véolia). Under the lease contract model, the remuneration of the private operator came entirely from the collection of tariff revenues from customers. Veolia offered the lowest average tariff, calculated based on a "base tariff" and "tariff adjustment factors" (billed water, inflation, exchange rate and energy) for the whole ten years of the lease contract as explained below. Following the contract award, Yerevan Djur, a closed joint stock company, was formed to execute the lease contract in Yerevan with CGE as its sole owner and shareholder. The lease contract was signed on December 14, 2005 for a 10-year period and officially began on June 1, 2006. The newly established company became the water utility providing services and directly billing customers.

[9] This key matter is discussed in more detail in Section 8, which captures the key lessons from the four PPPs.

The contract was designed as an "enhanced lease" with the private sector in charge of financing some minor investments, and subject to penalties for some KPIs. The private operator had to repair properties, plants and equipment with short depreciation periods by setting aside a portion of its tariffs revenues - meaning that it had to finance a portion of the capex by itself, instead of through government transfers. There was four KPIs subject to penalties: continuity of supply (average number of hours per day), quality of water (potability), time to respond to customers' complaints, and timeliness in execution of the investment plan (portion financed by the operator). Sales revenues had to cover the lessee's expenses and profits, at the operator's own risk and based on the tariff level that was the basis of the bid.

The private operator had to pay a leasing fee to SCWE, with the yearly amount defined under the contract, to service the debt attached to donor-financed programs as well as cover the rental of operating equipment.[10] This meant that apart from retaining an obligation to fund most of capex, the Government did not have to subsidize anymore a portion of the operational costs or the debt service of water services in Yerevan – effectively setting the water services in the capital city on a course to become self-financed.[11]

Performance monitoring: The lease contract had clear annual objectives and the private operator had to submit semi-annual performance reports. The PMU retained an Independent Technical Auditor and also two different financial auditors. SCWE and the private operator renegotiated the KPIs in 2009 to make the evolution of some targets more realistic based on the experience gained during the initial five years of operation. For example, the negotiations reduced the target hours of water supply for the 3rd to 7th contract years, increased them for the 8th and 9th years and left them unchanged for the final year.

Tariff setting: A ten-year program of tariff levels was established, with criteria for tariff adjustments. The base tariffs for the lease period were set during the tender process and were fixed in the license issued by the regulator in parallel with the signing of the lease (Table 3). The customer tariff for the first year of the contract was AMD 173/m3 (USD0.39), compared to a pre-lease tariff of AMD 125/m3 (USD0.28). It must be noted that although this represented an increase of 38 percent, the water tariff in Yerevan still remained well beyond the average tariff level in other countries of the region. The license issued by PRSC in parallel with the signing of the contract outlined the factors and formulas on which the base tariffs were to be reviewed, based on volume of retail water sold to consumers, inflation, euro / AMD exchange rate and energy costs (in accordance with tender documents).

[10] It is important to underline that the yearly lease fee was pre-set in a specific schedule of the contract. This represents the fundamental difference between a lease contract and an *affermage* contract, whereby the lease fee is replaced by a tariff structure whereby a portion goes to the private operator (operator's fee) and another portion goes to the Government to cover the debt service of capex.

[11] The total amount of the lease fee was almost AMD 4 billion (USD8.7 million). The lease fee paid by Yerevan Djur to the Government over the 10 years of the lease contract had been set up in the contract so as to cover the repayment (principal and interest) of the two World Bank loans provided for Yerevan PPPs (the previous one under the management contract, and the new one for the lease).

Table 3. Tariffs for the 10-year Yerevan Lease Contract, Base and Actual

	LC Y1 2006-2007	LC Y2 2007-2008	LC Y3 2008-2009	LC Y4 2009-2010	LC Y5 2010-2011	LC Y6 2011-2012	LC Y7 2012-2013	LC Y8 2013-2014	LC Y9 2014-2015	LC Y10 2015-2016
Retail services, AMD / m3 (including VAT)										
Retail tariff /base/	172.8	172.8	172.8	154.8	154.8	118.8	118.8	106.8	106.8	90.0
Retail tariff /actual/	172.8	172.8	172.8	181.0	181.0	174.1	174.1	170.3	170.3	170.3
Actual Adjustment	0.0	0.0	0.0	26.2	26.2	55.3	55.3	63.5	63.5	80.3
Adjustment amount based on formula by factors, AMD /m3 (including VAT)										
Water sales	0.0	5.1	15.1	13.8	21.6	36.9	34.2	38.3	38.9	38.5
Inflation (CPI)	0.0	2.3	3.4	13.2	14.7	16.6	22.0	21.5	25.5	25.9
Exchange rate (AMD/EURO)	0.0	-3.8	-10.2	-10.8	-6.0	-6.3	-4.1	-3.9	-1.5	-0.8
Electricity price	0.0	0.0	0.0	6.4	6.4	3.3	3.3	7.6	9.9	9.2
Total adjustment required by formula	0.0	3.6	8.4	22.6	36.6	50.5	55.3	63.5	72.8	72.9

Source: Calculations based on Yerevan Djur CJSC's annual reports and technical auditor's reports

Implementation of the Contract

The staff of the former YWMC public utility was transferred to the private operator at the onset of the lease contract. This was done on a voluntary basis. Although this meant a change in the benefits structure, switching to a private employment statute, a large portion of YWMC choose to join the private operator, as it provided for more perspectives of salary increases and professional advancement.

The private operator was left with significant flexibility for implementation of investments. In the first year, the operator had to define an investment program jointly with SCWE and execute it under the umbrella of the USD 20 million World Bank- and government- funded loan for the Yerevan Water and Wastewater Project (YWWP).[12] In practice, the operator enjoyed significant flexibility in identifying investments, preparing tenders and supervising civil works – an arrangement that was considered essential to ensure that the capex program would be implemented efficiently. In addition, GOA borrowed from other donors to carry out investment in Yerevan for a total amount of capex of about USD 68 million (Table 4). The donors adopted the approach followed by the World Bank for the identification and execution of civil works, leaving significant flexibility to the private operator under the control of SCWE.

[12] The first component of YWWP was the USD18.75 million YWWP Fund, which covered investment in systems rehabilitation and upgrading. In addition, a Project Preparation Facility financed consultants to draft the lease.

Overall, the total amount of capex invested over the 10-year duration of the lease was fairly modest, considering that it represented a per capita cost of less than USD 6 per year.

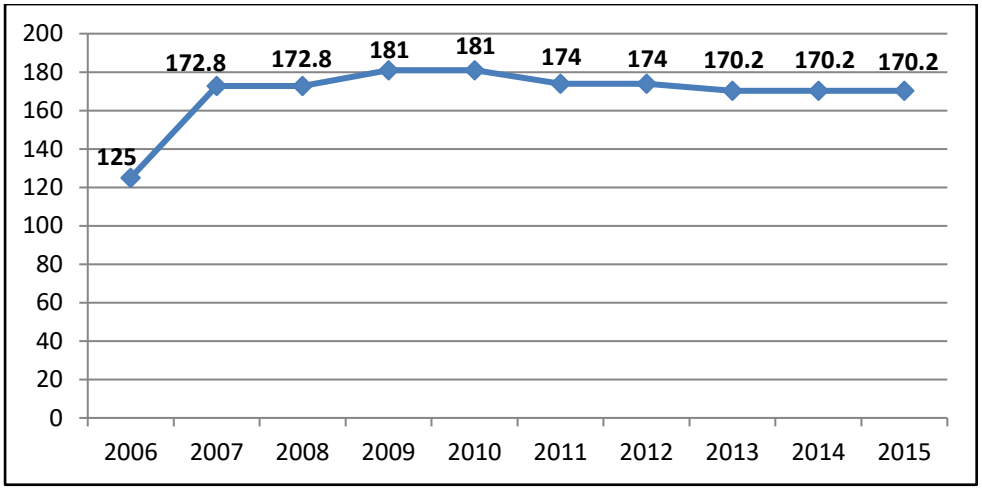
Table 4. External Loans and Credits in the Yerevan Djur Service Area as of December 31, 2015

Creditor	Loan / Credit	Loan currency	Loan amount in contracted currency (millions)	Loan amount in USD equivalent (approx.), millions
IDA	Yerevan Water & Wastewater Project	SDR	13	20
EBRD – EIB -EU	Yerevan Water Supply Improvement	USD	21	21
France	Yerevan Water Sector and Wastewater Improvement	EUR	24.4	27
Total amount: USD 68 million				

The actual evolution of tariffs broadly followed what had been agreed initially. For the first 5 years, the actual tariff adjustment was lower than the one allowed under the contract, as a result of negotiation between the Government and the private operator in exchange for some limited tariff subsidies.[13] The volume of water sales as well as inflation were the factors that contributed most to tariff increases compared to the base tariff, while exchange rate had a small negative impact. The low base tariffs at the start of the contract caused challenges for Yerevan Djur and made it difficult to carry out initially the necessary volume of maintenance and repair works. Moreover, customers had at first a mixed perception of the level of water tariffs in Yerevan. A survey found that 46 percent of households considered the level of the water bill to be “adequate”, 39 percent considered it “rather high” and 16 percent “very high” even though the water bill represented only a small fraction of household budgets. Figure 6 shows how tariffs evolved during the lease contract (in nominal terms, as there was a significant reduction in real terms when accounting for inflation).

Figure 6. Evolution of Lease Tariffs in Yerevan: Retail Services, AMD/m3

[13] The larger difference was in year 5, when the actual tariff adjustment was 28 percent lower than the amount allowed per the contract, with the municipality of Yerevan providing in exchange a one-off subsidy of USD1 million.



NB: Retail services refers to tariffs for households with a metered connection.

Monitoring of intermittent supply was carefully designed. Pressure loggers were installed in 60 zones of Yerevan city to register the duration of water supply to customers as required by contract. The performance standards on continuous water supply applied only to Yerevan but the villages supplied directly from the same transmission mains as Yerevan benefitted from 24-hour water supply as well. For the other villages – 10 in all - that did not have a connection to the main intakes, the minimum supply requirement was four hours. By law, the operator had to publish the hours of intended water supply service for each area of Yerevan twice a year in the press, and to enhance accountability, water supply hours were included in customers' bills as of February 2010.

The Yerevan lease contract placed greater emphasis on customer service than the Yerevan management contract (Box 3). The contract included a provision setting the permissible average response and repair time to major breakdowns during a given contract year at 24 hours. For written enquiries, the response time could not exceed 15 business days. Moreover, the operator was obliged to develop and maintain a computerized register of all customer complaints. The operator had to report on customer complaints and response times every year and the Independent Technical Auditor verified the report.

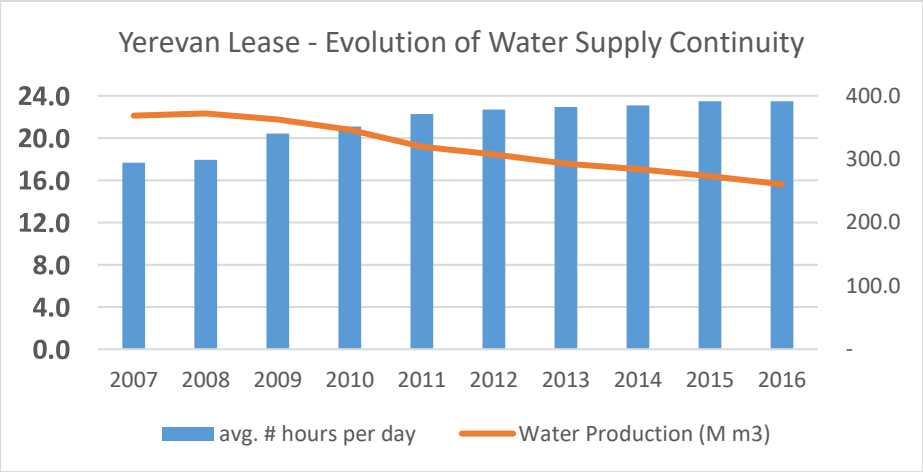
Box 3. Customer Service under the Yerevan Lease Contract

The operator set up a Customer Service Department, which dealt with subscribers' calls, e-mails and written complaints/inquiries. In the first year of the contract, it set up a "1-85" Call Center and a generic "1-85" number that all Yerevan Djur clients could access by landline and cellphone. After March 2014, it added three additional telephone lines to the existing ten lines. Subsequently, in 2015, the operator introduced new software to the 1-85 Call Center to localize calling subscribers on a map in order to understand better their issues. Following these improvements, the average number of calls received by the Call Center increased and the number of messages left decreased. The number of callbacks consequently went up by about 4,000 per month, which resulted in approximately 340,000 calls in 2014. About 30 percent of the calls were on commercial issues and the rest on operational and technical matters. Yerevan Municipality and independent audits verified that there were improvements in subscribers' complaints and that the number of "persistent" cases dropped.

Results and Key Factors

As Table 5 shows, **the lease contract was successful in building on the early progress made under the Yerevan management contract, with significant additional improvements in service quality and operational performance**. By the end of the 10-year lease, most of the population of Yerevan enjoyed continuous 24/7 water supply (Figure 7) and water fully complied with potability parameters.[14] The improvement in water supply continuity was not due to more water being inputted into the network – as the actual volume of water reduction went down – but to improvements in the hydraulics of the network. Almost all customers became metered and billed based on actual consumption.

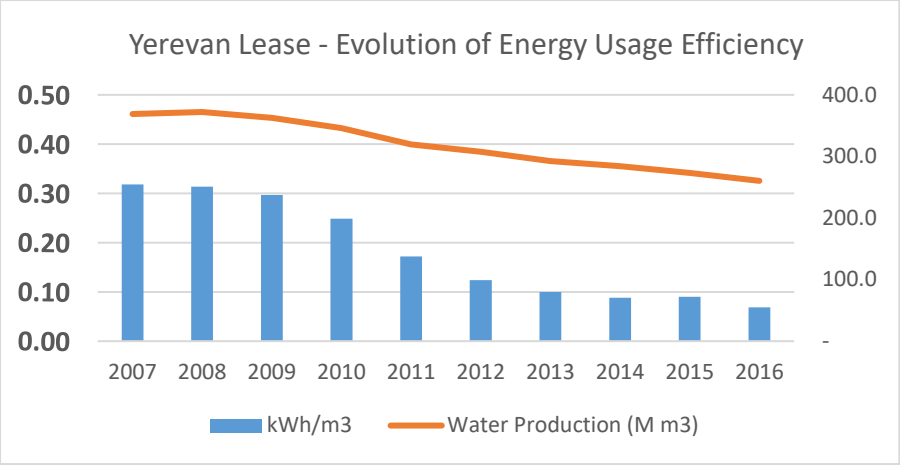
Figure 7: Evolution of the continuity of water supply under the Yerevan lease



Major improvements were also recorded in operational efficiency, with the most impressive result being the reduction in the consumption of energy by a factor of five compared to the level ten years before, and a concomitant dramatic increase in energy efficiency (from 0.8 kWh/m3 to 0.38 kWh/m3) (Figure 8). This was achieved through further investing in the modernization of network hydraulics (change in the intake structure to increase the proportion of gravity fed supply), as well as in new energy savings pumps. The bill collection rate was also significantly increased (up to 97.2 percent) and the labor productivity ratio was improved to 3.2 staff per thousand connections – figures that are comparable to well performing utilities in more developed countries.

Figure 8: Evolution of the energy efficiency (kWh usage per m3 produced) under the Yerevan lease

[14] The 23.4 hours per day figure as reported in the table is an average across all service areas of Yerevan Djur, including a few small towns outside of Yerevan not connected to the main water supply system and where there was still some intermittent supply, and some areas in Yerevan that still suffer moderate shortages in the summer.



One area where no improvement in performance was recorded is the level of water losses. While the level of losses did go down by 8 percentage points, it still remained stubbornly high at about 75 percent. This aspect deserves further discussion. The switch to continuous 24/7 supply in Yerevan was not achieved by increasing the volume of water injected into the distribution network – as is typically the case when a water utility attempts to move from intermittent to continuous supply. On the contrary, the actual volume of water production went down by about 25 percent over a decade (from 359 million m3 in 2005 to 270 million m3 in 2015). In practice, there is little question that the overall functioning of the distribution network did improve, with the generalization of pressure-reducing valves and the introduction of zoning to help identify leakages. But as the distribution network was also put under pressure for a longer duration (from an average of 18.4 to 23.4 hours per day, a 27 percent increase), the total volume of water lost through leakages was bound to increase given the absence of a major network rehabilitation program to replace highly deteriorated pipes on a large scale.

Table 5. Main technical and economic indicators for Yerevan during the lease contract period

Indicator	Base Year 2005	Lease Contract Year 10
Hours of supply, hours/day	18.4	23.4
Water quality compliance, %	97.2%	100.0%
Response Times for Major Breakages, hours	ND	6.43
Response Times for Written Enquiries, days	ND	7.37
Electricity consumption, mln. kWh.	124.2	23.6
Share of subscribers with water meter, %	87.0%	98.4%
Water supplied to network, mln. m3	359	270

By Gravity, %	56.6%	78.5%
By Pumps, %	43.4%	21.5%
Water Loses, %	83.0%	74.6%
Collected revenue, mln. AMD	4,435	11,298
Collection rate (%)	79.2%	97.2%
Number of staff per 1000 subscribers	4.9	3.2

Under the lease contract, financing for such network rehabilitation investment would have been the responsibility of the government, but **the total amount of donor financing that was ultimately available during the 10 years of the lease contract (about USD 60 million) was largely insufficient to allow the private operator to deal with the magnitude of the water network rehabilitation needs**. In reality, carrying out a massive rehabilitation of the water distribution network in Yerevan was also not a priority for the country, considering that overall donor funding had to be allocated across multiple priorities and sectors. Given the availability of plentiful and cheap water resources for the Yerevan distribution system, it is likely that the actual "economical level of water losses" (i.e. the level of leakages at which the cost of repairs exceeds the benefits from water saved) is quite high. The new lease contract, which includes a specific financial incentive for the operator to reduce water losses (see Section 8) will hopefully be able to reduce NRW in a significant manner – provided of course that there is enough capex funding.

One of the reasons for the good performance of the lease contract was that the operator was responsible for the implementation of the investment program, and did so efficiently. It was made possible by the flexibility left by SCWE to the private operator for identifying, designing and supervising civil works. While this project was still subject to SCWE scrutiny, allocating significant responsibility to the operator allowed to focus the limited capex funding available to those investments with the highest impact on improving service quality and operational performance, and also reduced the delays in execution as the private operator had clear incentives to complete each work as soon as possible.

Importantly, Yerevan Djur gradually transformed from a foreign operated company to a nationally managed one. During the contract, Veolia increased the salary levels of staff several times to incentivize good performance, in parallel with gradually reducing the total number of staff through retirement attrition. It also invested in staff development by sending many staff members for training to France. By 2012, an entirely Armenian team was managing Yerevan Djur until the end of lease, with no expatriates and only limited support from headquarters in France. There is wide consensus among stakeholders that significant knowledge transfer took place from the operator to local staff under the lease.

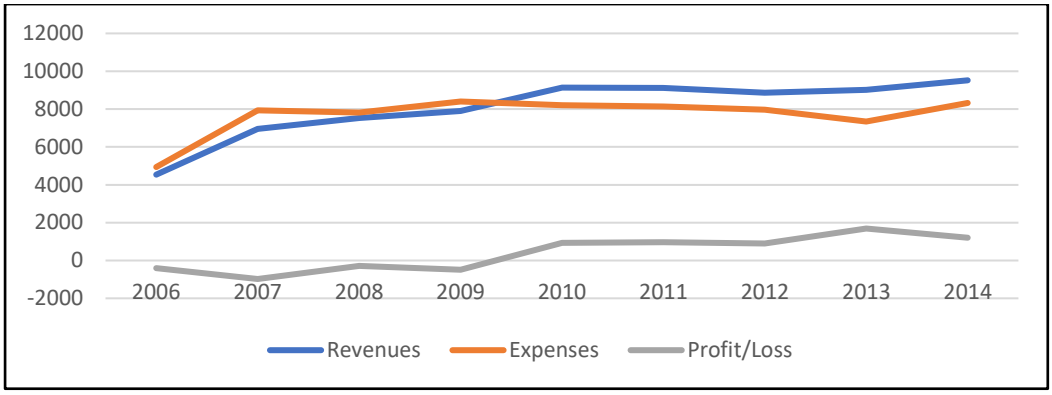
In the early stage of the lease contract, Yerevan Djur did not generate enough operating cash surplus for the private operator to be able to contribute to capex. This was a direct consequence of CGE having a rather aggressive financial proposal in the tender in order to win the lease contract – effectively taking a risk that it could still made the company profitable in the end. Over the first two years, operational costs increased by 60 percent, as the private operator made efforts to raise the level of service and operational practices. As a result, Yerevan Djur ran an operating loss during the first four years of the contract (Annex 1, Tables (i) and (ii)). To make up for the early financial shortfall, Veolia (the operator's sole owner) had to provide bridge financing of EUR 4 million in 2006-2007.[15]

Water services in Yerevan became fully self-financed by 2011. By year 3 of the lease, operational costs were contained and the company started to reach financial equilibrium, as revenues gradually increased with the collection rate - indicating that it was on a course towards becoming financially viable based on tariff revenues alone with full cost recovery of O&M costs. Yerevan Djur turned a first year of profit in 2010 (due partly to an operational subsidy from the municipality of Yerevan), and became financially self-sustainable by 2011. During 2006 to 2015, the private operator made a cumulative operational profit of about USD4.1 million or about USD 0.45 million per year on average (before taxes).

A **beneficiary survey conducted in December 2011** found that the majority of respondents (65 percent) thought that water system management in Yerevan had significantly improved since the beginning of the lease contract. Only 6 percent thought the trend was negative. The survey also found that 16 percent of respondents found the tariff at the time to be very high and 46 percent thought it was adequate, although in reality the average water bill did not exceed 2 percent of households' overall monthly per capita spending. Only 30 percent of respondents wanted to revert to state-managed services rather than PPP.

Figure 9. Evolution of Revenues and Expenses for Yerevan Djur Lease Contract (million AMD)

[15]Of which EUR 1 million was equity and EUR 3 million was debt. The debt was fully paid as of January 1, 2015. The municipality of Yerevan also provided a one-off operational subsidy in 2010.



Main Messages and Lessons Learned

The clear success of the Yerevan lease contract shows the overall benefits of a lease model over a management contract. The lease contract generated a "cultural shift" towards improving the quality and efficiency of water services, with a wider transfer of risks and responsibilities and much sharper incentives. The private operator was henceforth taking all operational and commercial risks, but in exchange had much more flexibility to make operational decisions, with all employees being under private contract. The operator was also involved for a much longer duration, giving enough time to make in-depth cultural changes in the way the utility functioned. The lease contract introduced a simpler and sharper "built-in" incentive framework, pushing the private operator to reduce its operating costs and increase billing and collection. The **adoption of an "enhanced lease" structure with some capex funded by the private operator and a few key KPIs subject to penalties made the incentives framework even sharper**.

The positive experience of the Yerevan lease also shows the benefits of a sequenced approach to PPPs. Despite its obvious benefit, the implementation of the *lease/affermage* model (which was originally developed in France and Spain) in a developing country has had a rather mixed record over the last two decades. While it was successfully replicated in the Czech Republic (where about 70 percent of the urban population is now served by private water operators under municipal leases), as well as a few cities in Slovakia and Poland, the track record in developing countries has been more uneven. *Affermage* contracts have proved very successful in Senegal and Niger for improving services, and gradually achieving financial sustainability of the water sector (just like in Yerevan), but attempts at implementing lease contracts in other African countries have been disappointing. For instance, the lease contract that started in 1999 in Maputo (Mozambique) had brought rather mixed results, and the lease contract in Dar El Salam, Tanzania (2003-04) was canceled in its second year amidst acrimonious disagreement among the public and private partners. The mixed results across these countries suggest that **the complexity of the lease/*affermage* approach requires careful preparation and entails significant risks** in developing countries with limited capacities and widespread governance issues - and that their implementation may be enhanced by adopting a gradual approach like in Armenia.

In the case of Armenia, there are indications that the earlier implementation of the management contract in Yerevan did facilitate the implementation of the lease contract later on, as confirmed by interviews with SCWE staff in charge at the time. If the Government had gone for tendering a lease directly in 2000, the uncertainties with baseline data and overall country risks – not to mention the lack of previous

experience with water PPPs - would have made it unlikely that the winning bidder would have accepted to take the kind of financial risks that Veolia did. The foundation set by the Yerevan management contract made the future lessee more willing to plan on a major turnaround in revenues and collections and more accepting of financial losses in early years. Had the Government gone immediately for tendering a lease contract – without going first through the management contract - there likely would have been a higher tariff hike for customers as a result of the tender, and the end tariff would probably have been higher – which would have probably endangered the entire PPP reform. It would also have been difficult to implement an "enhanced lease" structure with targets for key KPIs without a reliable baseline.

Finally, **one key element of the success of the Yerevan lease is the flexibility that was left to the private operator for designing and implementing the capital investment program**. This was based on an arrangement that gradually evolved as SCWE and donors became comfortable that the private operator could be trusted to implement capex in an efficient manner. This assessment was confirmed through all interviews carried out with donors who supported the Yerevan lease contract, as part of the preparation of this study. Given the fairly limited amount of funds that were available from donors during the 10 years of the lease, this arrangement was key in ensuring that investment would be targeted at actions that generated the maximum impact in improving service quality and operational efficiency.

4. ARMENIA WATER AND SEWERAGE COMPANY (AWSC) MANAGEMENT CONTRACT: 2004-2016

Water Sector Context in Secondary Towns and Cities before the Management Contract

The Armenia Water and Sewerage Company (AWSC)'s service area included almost 320 cities, 37 urban centers and 283 rural communities covering a **total population of about 620,000 people outside Yerevan**. AWSC had been operating as a national public water company since the recentralization of water services in the late 1990s, and was fully owned by SCWE. At the start of the management contract, about 15 percent of the population received water from public standpipes. AWSC had about 250,000 connected customers spread throughout the country, with infrastructure consisting of 441 abstraction points, over 8,000 km of water supply networks, 12 water treatment plants and a multitude of reservoirs, pumping stations and chlorination points. The sewerage system consisted of 2,000 km of pipes and served about 53 percent of water customers. Many of the water systems were gravity fed due to the local topography.

Prior to the management contract, AWSC faced many serious challenges in delivering services. The structures and pipelines of the water and wastewater system were dilapidated and there was insufficient maintenance and rehabilitation of assets for years. Because of widespread water leakages, deteriorated electrical and mechanical installations and poor operational management, the average daily supply of water was only about six hours. Operating costs were high, due in part to heavy power consumption needed to keep the few operable but inefficient pumps in service. There were frequent leaks and overflows in the sewage system. Figure 8 illustrates the poor state of the infrastructure.

Figure 10. State of Water Infrastructure before AWSC Management Contract

Burst pipes leading to spectacular leaks

Distribution chamber

Pumping station

Credit: Patrick Lorin

AWSC was in poor financial shape before the start of the management contract. Even though the customer tariff had almost doubled since 2002, it still stood at only 100 AMD per m3 (about USD0.21 per m3). Collected revenues were not enough to cover operating and maintenance costs. The population in the small towns and rural areas that were part of AWSC's service area had relatively low incomes (about half that of Yerevan), so capacity to pay was small. At the same time, the unreliable service provided and poor billing system (60 percent of customers were billed on estimates) resulted in low willingness to pay. Illegal connections were widespread, involving many businesses such as hotels, workshops and industrial bakeries close to pumping stations. As a result, the bill collection rate was a mere 47.9 percent, with four out of five customers having more than 4 months' debt with AWSC.

There were considerable water leakages, but the actual volume could not be properly calculated due to a total lack of customer and bulk metering. Operating costs, which had increased from USD5.45 million in 2001 to USD7.1 million in 2003, exacerbated the poor financial situation due to weak revenues. A bloated workforce, at 9.45 employees per thousand connections, added to the problem. To cover its growing cash deficit, AWSC had to rely on subsidies from the Government, including exemption from paying VAT. The Government also had to directly pay the company's bills to the electric power company and the bulk water supplier. The situation was clearly becoming unsustainable by the early 2000s.

Tendering and Contract Terms

While **the idea of undertaking a management contract with AWSC had germinated at the same time as that for the Yerevan management contract**, the Government decided to wait until initial improvements were made, and early lessons learned from the Yerevan experience. In 2002, the Government took the decision to go ahead, but after having restructured AWSC's balance sheet in order to prepare it properly for private management. The Law on Debt Forgiveness in 2002 led to the write-off of AWSC's debts and reduced its deferred liabilities and other arrears significantly. The goal of the restructuring was to shield AWSC from debt accumulated prior to the management contract.

Contract preparation was just as meticulous as for the Yerevan management contract and also began two years before tendering**.** In addition to hiring a consultant firm to do an options review, prepare bidding documents and draft the management contract, the Government prepared an outline of the priority works program that AWSC would implement under the private contractor. Although this capex

program was indicative and the contractor was given flexibility to refine it, defining the program early minimized the risk of implementation delays.

In 2003, the Government issued a call for tenders for a four-year performance-based management contract. Ten firms submitted Expressions of Interest and four international operators from France, Germany and Italy ultimately submitted bids. The Government evaluated the bids from January to April 2004, reviewing both technical and financial proposals, and finally selected the French water operator SAUR as the winner. The management contract was signed on August 19, 2004 and transferred the powers of the Executive Body of AWSC to the new private operator, who in turn established a dedicated local subsidiary company (Saur Sevan Services) to implement the contract. Annex 2 has more details on the tendering process which was carried out with the technical assistance of the World Bank.

The contract duration was set originally for four years, with the possibility of a two-year extension, but finally lasted for 11 years. The contractor had two sets of responsibilities under the management contract. The first was to administer AWSC's daily operations, including technical, commercial, financial and personnel issues. The second was to define, prepare, implement and manage the capital expenditure program. The private operator would formally apply for tariff revisions on behalf of AWSC, with PRSC responsible for reviewing the request and making a decision on the proposed tariff – but this could not impact the remuneration of the private operator which came (partly) from its performance-based management fee and not from tariff revenues. At the beginning of the management contract, the average share of the water bill in household expenditure was about 1 percent in the area served by AWSC.

As with the other PPP contracts in Armenia, donors financed the investment program and supported the overall partnership. **The World Bank's Municipal Water and Wastewater Project (MWWP)** provided a USD 43million loan package to finance the implementation of the investment program. In addition to supporting the preparation and tender of the AWSC management contract, the project components financed (i) the fixed fee and performance bonus of the private contractor for the first four years of the management contract; (ii) various costs associated with improving operations, including a redundancy program to reduce AWSC's staff, the purchase of communication equipment, training facilities, staff training activities and laboratories to test water quality; (iii) a revolving fund for the installation of block meters in condominiums, and for financing some of AWSC's operating expenses, such as spare parts and chemicals; and (iv) the rehabilitation of water supply and sewerage networks and other branch investments such as offices and operating equipment. Other donors – EBRD, EIB, NIF and ADB - also provided financing for capex, bringing the total amount to USD 180 million (Table 6).

Table 6. Summary of Loans that AWSC Received During the Management Contract

Source	Description	Dates	Amount (USD)
World Bank (IDA)	Municipal Water and Wastewater Project (MWWP). 2 credits provided by IDA	2004-2011 2012-2015	$43 million
EBRD – EU - EIB	Armenia Small Municipalities Water Project	2011-2015	€20 million ($26 million)

EBRD	Armenia Lake Sevan Basin Environmental Project	2006 - 2012	€7.0 million ($9.5 million)
European Union	Armenia Lake Sevan Basin Environmental Project	2006 - 2012	€5.0 million ($6.5 million)
ADB	Water Supply and Sanitation Sector Project. The project had 2 components: i) upgrade and rehabilitation of WWS systems in 16 towns and 125 villages and ii) improvements in management and operational efficiency.	2008 - 2013	$50 million
ADB	Additional financing of the WWS Sector Project	2012-2017	$45 million
Total			**$180 million**

The contractors' fees comprised a fixed fee and a Performance Incentive Compensation. This performance-based remuneration comprised a schedule of bonuses and penalties. The fixed fee was a monthly lump sum paid to cover the expenses of implementing the management contract. When the contract was amended in 2011, the Performance Incentive Compensation was set not to exceed the equivalent of 25 percent of annual base management fixed fee. The penalties could not exceed the equivalent of 20 percent of the annual base fixed fee for the same period. In addition, the management contractor had to provide a performance guarantee of 10 percent of the total amount of the management fixed fee for the duration of the contract.

The AWSC management contract included 25 performance indicators – much less than the 93 indicators in the Yerevan management contract. The rationalization of indicators reflects a significant lesson learned, as having too many KPIs had been cumbersome to manage and proved un-necessary. Similarly, NRW was not included as a contractual indicator in the AWSC management contract, in recognition that the contract was not designed to make an impact on the NRW level. Of the 25 contractual indicators, only four were linked to incentive compensation and were the actual focus of the management contract: (i) continuity of water supply, (ii) effectiveness of meter installation program, (iii) water safety compliance, and (iv) company operating efficiency (collection ratio) – with different weights for calculating the bonuses and penalties. In the case of service duration, the bonuses/ penalties could not be more than 10 percent of base management fixed fee for a given year. The contract defined three groups of cities and set differentiated targets for each of the groups, as well as separate targets for rural communities.

Implementation of the Contract

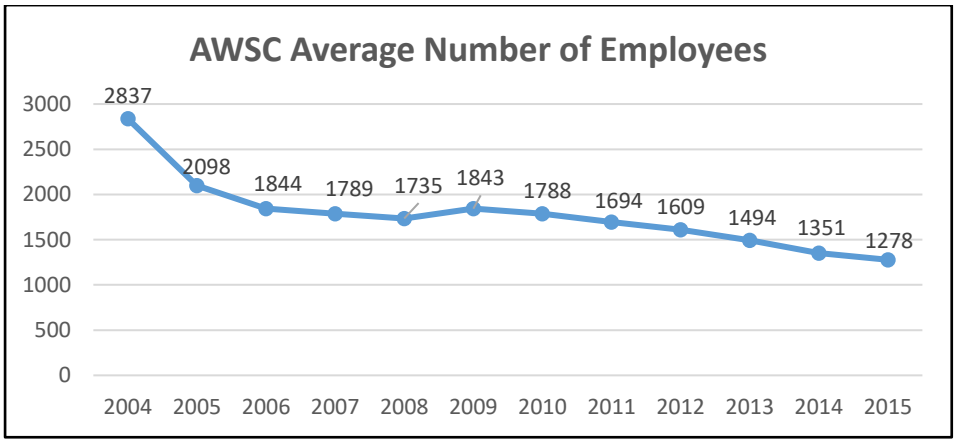
One of the main challenges of improving AWSC performance was to deal with the geographical fragmentation of the services, spread over all the territory of the country. Initially, the team consisted of 21 experts, including seven SAUR Group staff (reducing its expatriate staff to three by the fourth year). During the first year, the contractor rationalized 36 former AWSC branches into four well organized and operationally autonomous regional branches, with procurement and revenue centralized at head office.

While this rationalization process generated resistance from local authorities, the contractor was able to go ahead through the backing of SCWE and the powers granted to it in the contract.

The contractor also worked on optimizing staffing arrangements. In 2004, AWSC employed 2,837 people, of which 2,250 were based in more than 37 territorial branches and the rest at headquarters in Yerevan. The staffing ratio - at 9.45 staff per thousand water connections- was clearly excessive, even when allowing for the wide dispersion of infrastructure systems across the AWSC service area. Moreover, staff members were poorly motivated and had limited opportunities for professional development. Through natural attrition as well as a voluntary redundancy program financed by the MWWP, the private operator managed to rationalize the workforce and gradually reduce the size of AWSC's employees down to a more reasonable staffing ratio of 6 employees per 1,000 subscribers (Figure 9). Staff members reportedly welcomed the retrenchment and many volunteered to leave because of the attractive terms offered.[16] In the meantime, the average salary for remaining staff was raised significantly, from 32,000 AMD (USD 70) to 56,000 AMD (USD 120) per month over the duration of the management contract.

Some early challenges to implementing the management contract are worth noting. The Electrical Network Company unilaterally decided to cut off electricity supply to all AWSC facilities within hours of the management contract signature, due to large unpaid bills – an issue which had to be dealt with the help of SCWE as a matter of priority. While MWWP subsidized the cost of installing residential meters for low-income households, benefiting about 2,000 households, there was some resistance from rural areas when the contractor wanted to regulate the flow of water to villages, as many considered water to be an ancestral possession and refused to come under the remit of the contractor.[17]

Figure 11. Average Number of AWSC Employees, 2004-2015



[16] The severance packages covered all debts to employees, including late salaries, up to 10 years of unused vacation and indemnities due to the termination of the contract.

[17] In Odzun, for instance, the village consumed a significant volume of water that was needed downstream by several other towns. Through sustained discussion, the village eventually acquiesced to having water meters installed and allowing increased water flow to be made available downstream for other villages.

In the context of the MWWP, **the AWSC investment program prioritized water production, water distribution and wastewater collection in small and medium towns** so as to reach the maximum number of people given the limited available funding for investment. In villages and smaller settlements, activities focused first on providing sufficient bulk water supplies and renovating pumping stations. Faced by a rather daunting task given the state of disrepair of most water infrastructure across the country, the private operator worked on establishing priorities. It focused on "quick win" solutions, including improving valve operations, modernizing chlorination points, urgent repairs and replacement of equipment, as well as simple network rationalization to reduce losses.

There was a notable effort to improve commercial practices – much more than under the first management contract in Yerevan. A dedicated customer call center was opened. To deal with illegal connections, the operator installed water chamber meters at the borders of each property as a way to prevent illegal connections upstream of the water meter. Some creative measures were taken to promote payment discipline among customers, such as creation of a national lottery for customers who regularly paid their bills each month and had a water meter installed.[18]

The contract was extended several times until 2016 – finally lasting for 11 years in total, a reflection that the Government was both satisfied with the gradual improvements and cognizant that the private operator needed time to make an impact on AWSC given *inter alia* the fragmentation of services across the service area. In October 2008, the contract was first extended by two years and then for an additional year until October 2011. In 2011, an amendment introduced penalties to the contract (bonuses were already included from the beginning). Another extension was granted until 2014 as part of a negotiation whereby SAUR joined the consortium of the management contract for Lori, Shirak and Nor Akunq. Finally, when the government made the policy decision in 2014 to adopt one single operator for the whole country under a lease contract, the end date of the AWSC contract was extended further until 31 May 2016 to align with the end date of the Yerevan lease contract. There was a final contract extension, from June 2016 to 21 December 2016, to accommodate the late tender process for the national lease contract (See Section 7).

When the parties extended the contract in October 2011, they reformulated it as an "enhanced management contract". The change was to allow the operator to maintain a certain level of performance once it had achieved the target set in the KPIs. The operator had to both manage AWSC and prepare a "Total Management Plan" (TMP) as part of the enhanced management contract approach. According to the contract amendment, the TMP included a Business Plan and an open format financial forecasting to advise the government on developing a long-term funding strategy. The TMP's aim was to help SCWE make better decisions on when it was most appropriate to repair, replace or rehabilitate particular assets. The contractor had to develop an asset inventory, undertake sectorization of the water distribution system and set a timeline for rehabilitating critical assets.

[18] Every four months, the AWSC lottery draw took place on live television for a gain of USD1,000, equivalent to about 6 months' salary on average in Armenia at the time. The lottery – which had began with three winners every four months and reached up to 10 winners at its peak – was a notable success with the public.

The first tariff increase under the management contract took place at the end of 2005. Tariffs went up from 100 AMD/m3 (USD0.21/m3) in 2004 to 140 AMD/m3 (USD0.30/m3), a 40 percent increase. There was a second tariff increase in 2008, this time raising the tariff by 25 percent. By 2016, the combined water supply and sewerage tariff had reached 180 AMD/m3 (USD 0.38/m3) (Table 7 and Figure 10). The increase led to a significant income boost for AWSC, which allowed *inter alia* to pay for increases in staff salaries, but proved insufficient to allow AWSC to become financially self-sustaining. **AWSC continued to receive subsidies from the government every year**. The subsidies increased from 8 percent of operating revenues in 2004 to 35 percent by 2010 (Table 8). These subsidies covered debt service as well as a portion of O&M costs, and were provided in a manner that was neither transparent, targeted nor time-bound.

Table 7. Average Water and Wastewater Tariff, AWSC Management Contract

Service	Measure Unit	2004	2005-2009 March	2009 April-2016
Water Supply	AMD/m3	90.36	115.65	154.47
Sewerage	AMD/m3	10.05	24.35	25.31
Water Supply and Sewerage	AMD/m3	100.41	140.00	179.78

Figure 12. Average Water and Wastewater Tariff, AWSC Management Contract, AMD

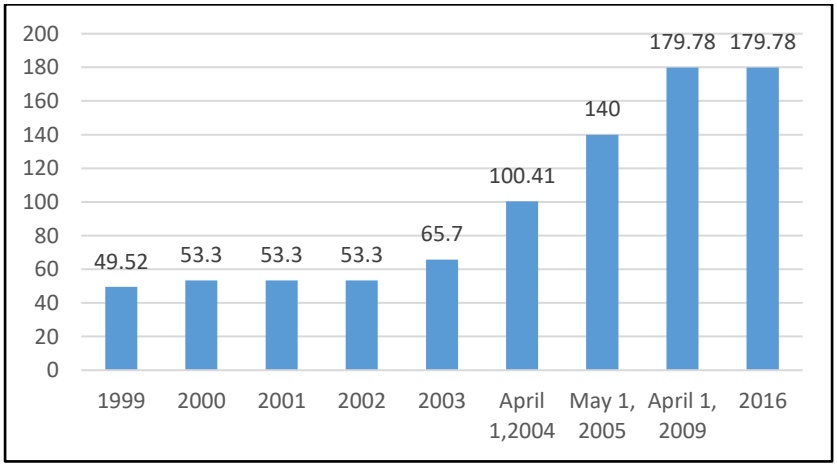


Table 8. Subsidies to AWSC during the Management Contract

mln. AMD	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Subsidy	1366.5	1381.3	1381.3	1213.5	863.4	811.6	811.6	1076.2	1509.5	1547.3	2170.7
Operational Subsidy	1366.5	1381.3	1381.3	1213.5	863.4	811.6	811.6	1003.2	1404.2	899.4	1226.8
Subsidy for Debt Service	0	0	0	0	0	0	0	73	105.3	647.9	943.9

The private operator introduced several technological innovations to AWSC's operations. These included HDPE pipes, loggers with online flow and pressure in strategic points and a GPS system to track all vehicles. These technologies helped to optimize the technical operations of the company. In addition, the contractor switched to reading the water meter by photo camera, which transmitted the photo directly to the billing center. This move helped reduce human errors and the risk of tampering by meter readers. Building on the early successes of the initial investments, the contractor focused on reducing energy consumption, by rehabilitating the biggest pumping stations, improving pumping time by using the night tariff, switching to gravity supply as much as possible and decreasing water losses.

During the third phase of the contract, **the emphasis shifted to strengthening customer relations**. The contractor established a Customer Service Center with a call center and centralized billing. Initially, customers were worried about lodging complaints to the customer center or using the customer hotline, as they had been discouraged by some AWSC employees from doing so. In response, the contractor invested in training its staff to be more welcoming to customers. The contractor also initiated a public relations and education campaign, using the media and NGOs.

Results and Key Factors

The AWSC management contract proved efficient in significantly improving the continuity and quality of water supply throughout the country. At the beginning of the contract, water supply was only 6 hours a day and continuity was the most important challenge. As customers were not willing to pay for such poor water supply, improving the reliability of services was crucial for catalyzing a virtuous circle and increasing willingness to pay. Throughout the contract, **improvement in water supply averaged a steady 1 additional hour per year** and increased three-fold with **about 18 hours of service per day on average** by the end of the contract (Table 9). At the same time, the quality of the water delivered improved markedly, with up to 98.7 percent water potability compliance by the end of the contract.

These results were achieved by focusing on some key operational actions: repairing the most visible leaks, modernizing the reservoirs, rationalizing the distribution network including with generalization of pressure reduction valves, more efficient pumps and fighting illegal connections.[19] The improvements proved generally stronger in towns than in villages, reflecting the lack of sufficient funding for investment for smaller settlements where unit costs were higher. A beneficiary survey conducted in December 2011 found that 74 percent of respondents thought the quality of water and wastewater management had improved since 2004, while only 21 percent thought it had remained the same and 5 percent that it had worsened. Only 33 percent of respondents wanted to revert to state-managed services at the end of the management contract.

[19] There was a full rehabilitation of two water treatment plants in Dilijan (northeast), the construction of two water reservoirs in Sevan and the replacement of leaky pipes in Dilijan and Sevan. The contractor also rehabilitated 10 pumping stations and 13 storage reservoirs, installed 221km of water distribution pipes in 14 urban areas, and installed 59 energy efficient pumps in other urban and rural areas.

Table 9. Selected Performance Indicators, AWSC 2004-2015

Performance Indicator	Measure Unit	Base Year 2004	2015
Hours of supply	hours	6.04	18.00
Share of costumers with water meter	%	40.2%	86.1%
Water quality compliance	%	93.8%	98.7%
Share of communities with the minimal hours of supply	%	68.1%	99.3%
Revenue collected on domestic subscribers per registered inhabitant	AMD	166.00	552.00
Collection rate,%	%	47.9%	90.1%
Share of subscribers with the more than 4 months debt	%	79.5%	19.5%
Average domestic metered consumption per registered inhabitant	liters	81.00	120.00
Number of staff per 1000 subscribers	person	9.45	4.80
Electricity consumption	kWh/m3	0.43	0.22

The operational performance of AWSC was also significantly improved under the management contract. The bill collection rate went up from 47.9 percent in 2004 to 90.1 percent in 2015. The labor productivity ratio was divided by two, down to 4.8 staff per thousand connections. The proportion of metered customers more than doubled, up from 40.2 percent to 86.1 percent. Energy efficiency improved twofold, with unit consumption down from 0.43 kWh/m3 to 0.22 kWh/m3.

However, there was little progress made in improving the financial situation of AWSC, despite a more than threefold increase in the collected revenues from water sales. While unit operating costs continued to be very high - due in part to the wide dispersion of services across the country which stymied the achievement of economies of scale – the tariff level was still below the one in Yerevan by the end of the management contract. As a direct consequence, AWSC continued to depend on government subsidies for its financial survival. Over time, AWSC's equity decreased from the equivalent of USD 56 million in 2004 to USD 2.6 million in 2010. Part of the difficulty was that the available funds for capex were too low, given the overall deteriorated state of the system, compared to what would have been needed to carry out modernization works and significantly reduce operating costs.

While **NRW was not part of the performance indicators at the beginning of the contract**, targets were set for water losses (defined as NRW in the contract) in the fourth contract amendment in 2011. The target was to reduce water losses from 83 percent in 2010 (which had gone up from 76 percent since 2005) to 70 percent in 2014. There was only marginal improvement and the target was not met, as the level of NRW stood at 78.4 percent in 2013. AWSC did make significant efforts to rationalize the distribution systems – including *inter alia* installing pressure reducing valves, replacing 180 km of pipes, and replacing leaking pipes and valves in the basements of apartment buildings – but these actions more or less merely compensated for the negative impact on leakages due to improved continuity of supply (as increasing duration and pressure increases leakages). The massive investment required to rehabilitate the water distribution system across the 320 towns and smaller villages covered by AWSC was not affordable

for the government finances. Again, as in Yerevan, the economic level of leakages for AWSC is probably quite high anyway given the abundance of low cost water resources across most of Armenia and the fact that most distribution systems are gravity based.

Between 2004 and end 2011, the contractor had earned a total USD 17 million in management fees. Of this amount, USD 14.5 million was for the fixed fee and USD2.5 million for the performance bonus. Up to year 9 (2013), the management fee was paid by the World Bank but as of 2014, this was done by KfW. The fee was net of VAT and Enterprise Profit Tax as per the specific terms of the management contract.

Main Messages and Lessons Learned

The AWSC contract shows an evolution in the design of management contracts in Armenia. First it focused on both managing and supervising the construction of infrastructure. This approach was in contrast to that of the Yerevan contract, which focused on a smaller set of activities, particularly metering and some limited rehabilitation. Second, the number of KPIs was significantly reduced.

Like in the case of Yerevan and despite a more challenging environment, **the AWSC management contract achieved significant improvement in service quality and operational efficiency**. However, the dispersion of systems across the country made this process lengthy, difficult and costly. The 12-year duration of the management contract is unusual for what should be a short-term arrangement, reflecting the many adjustments that had to be made in the course of implementation and the lengthy decision-making process the Government undertook with the support of its development partners on the timeline and structure of the second generation of water PPPs that started in 2017.

Achieving financial sustainability for AWSC proved elusive. Although the private operator delivered efficiency gains, reduced operating costs (especially electricity) and improved bill collection, these actions were insufficient to fill the gap between revenues and operating costs, largely because of insufficient tariff levels. The AWSC experience suggests that the approach of seeking first to improve quality and raising tariffs only after service improvements may work somewhat against the objective of reaching financial autonomy. In this case, while service quality undoubtedly improved in terms of reliability, new connections, customer service and water quality, it is not clear that customers' willingness to pay did not increase concomitantly. Tariffs would have had to increase by 50 percent more to cover O&M alone, and the government showed no desire to take this action.

As in the case of the Yerevan management contract, **the overall outcome of the AWSC management contract is positive yet somewhat mixed**. While the AWSC contract achieved significant improvements in service quality and operational efficiency, it failed to make a significant impact in the financial situation of the utility. Again, like in Yerevan, the Government's answer to this problem was not to move away from the PPP, but instead to upgrade to a new level under the second generation of PPP reform initiated in 2016 – passing the 320 towns and many other settlements served by AWSC under a lease contract, following the successful approach implemented in Yerevan since 2005. Contrary to the earlier Yerevan case, there was recognition that such a lease was not financially viable on its own because of the higher unit costs due to the smaller size of many systems, and additional costs of managing services spread through the whole territory of the country. The Government therefore decided to tender a single national lease contract in 2016, thus allowing cross-subsidies between Yerevan and the rest of the country.

As with the experiences of the Yerevan management contract and the lease contract, AWSC's management contract confirms the **benefits of giving the operator autonomy to manage the water company and execute the investment program.** The government's role was restricted to supervising and monitoring the performance of the contractor, with minimal interference in how the operator did its job. The operator designed and executed the investment program, managed the financial resources and contributed working capital. This provided for an efficient alignment of incentives, as the private operator had strong incentives to ensure that civil works were carried out diligently and would be directed at actions having the greatest impact on the performance indicators monitored under its contract. And the Government, as well as the donors financing the capex, still had strong presence through supervision.

5. REGIONAL UTILITIES MANAGEMENT CONTRACT: Nor Akunq, Lori and Shirak (2009-2016)

Water Sector Context: Regional Utilities before the Management Contract

A History of Municipal Public Water Management. The three regional water utilities, Shirak Water and Sewerage Company (WSC), Lori WSC and Nor Akunq WSC provided water and sewerage services to a combined population of 330,000 people in 5 towns and 60 rural settlements. Those services were separate from AWSC, as the municipalities of Shirak, Lori and Nor Akunq had been directly managing these companies since the 1996 decision by Government to decentralize water and sanitation services. Lori WSC supplies one town and 16 rural communities, Shirak WSC supplies two towns and 35 rural communities and Nor Akunq WSC supplies two towns and nine rural communities. The three regional utilities were organized as joint stock companies with the central government (through SCWE) holding majority control with 51 percent of the shares and local authorities owning the rest of the shares.

The decentralization of water services in the 1990s had proved to be unworkable, as **municipalities lacked the capacity to provice quality services and maintain the infrastructure**. However, when the decentralization reform was reversed, the three utilities were not integrated into AWSC, as KfW singled them out with a program to support municipal management of water services. Under its Communal Infrastructure Programs, KfW provided a total of EUR95 million to these three regional utilities over three successive phases: 2001 – 2005, 2012-2015 and post 2015 – combining investment with extensive technical assistance. However, the attempt at turning around these municipal utilities proved quite disappointing despite all the efforts. The poor service quality and performance largely continued despite the investments and technical assistance provided under the KfW project – with the notable exception of the bill collection ratio where significant improvement was achieved under public municipal management. This situation stood in contrast with the wide positive improvements achieved under the PPP program of the Government, especially the management contract for AWSC that served most of the remaining towns and villages in the country, under technical conditions comparable to those in these three cities. KfW subsequently revised its approach and agreed to the Government's request to provide support for another management contract targeted at the three regional utilities.

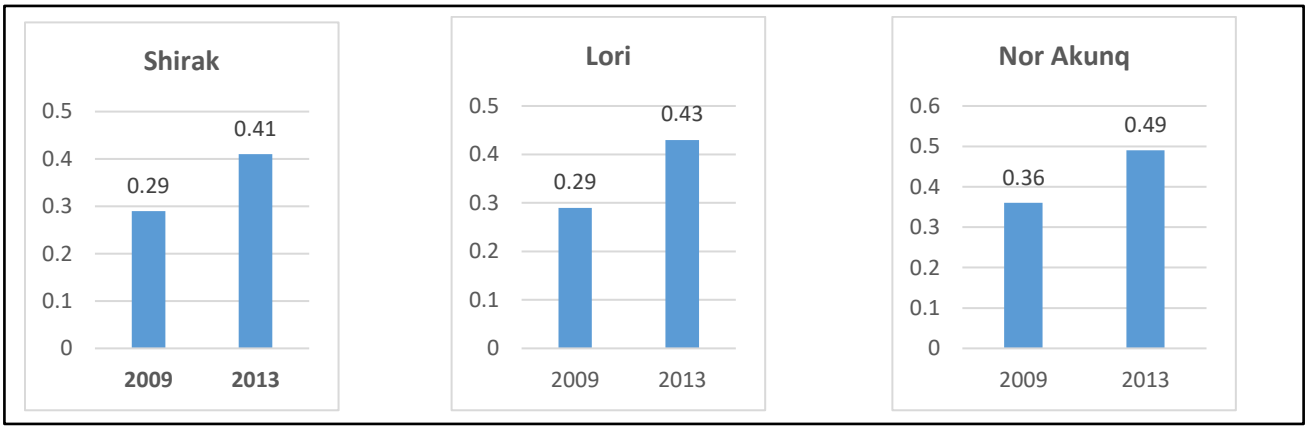
Tendering and Contract Terms

Because these three companies were too small to tender separately, **the government decided to bundle them under one management contract with a single private operator**. KfW provided assistance for the design and tendering process. A competitive tender was issued in 2008, with bidding documents prepared under technical assistance from KfW. A consortium of MVV Decon, MVV Energy and AEG Services (an Armenian firm) was selected as the private operator for Nor Akunq WSC, Shirak WSC and Lori WSC. The 3-year management contract was signed in 2009, with the explicit possibility of further extension. Following an amendment to the contract in 2013, penalties were introduced starting in 2014.

The contract value was USD7.4 million for the overall management fee, financed by KfW, which also provided financing for capex under its Communal Infrastructure Programs (II and III), to the tune of EUR

68 million (USD70 million) during the span of the management contract – a capex amount equivalent to USD212 per capita or USD 30 per capita per year. The Government remained responsible as majority shareholder for developing and funding the capital investment program. Tariffs were slightly lower in Shirak and Lori than in Nor Akunq at the beginning of the contract, although all three cities received tariff increases during the contract period (Figure 11). The average tariff for all three cities increased from USD0.31/m3 in 2009 to USD 0.44/m3 in 2013, representing a 42 percent increase. Because major tariff increases had already taken place under public management, this tariff increase was smaller than that faced by AWSC. The final tariff for the three utilities stood well above the one applied by AWSC in other towns and villages across the country, which was about USD0.30 per m3.

Figure 13. Increase in Tariffs Compared to Base Year (2009), $/m3



Implementation of the Contract

While SCWE monitored the performance of the private operator, the **management contract of the three regional utilities was different from the other management contracts** in that the municipalities were strongly involved at Board and managerial level. In theory, this arrangement could have promoted transparency and accountability, and enhanced the supervision of the private operator. In reality, it ended up allowing undue interference by local officials in the daily management of the utilities. For instance, even though the three utilities were grossly over-staffed, it was difficult for the private operator to initiate a serious rationalization effort due to multiple pressures from local governments. Moreover, the regional utilities did not benefit from the same kind of retrenchment fund set up under the World Bank loan for AWSC. This governance challenge seriously affected the capacity of the private operator to achieve significant performance improvements. Another difference is that the private operator had less flexibility for identification and execution of investments, as the municipalities wanted to stay involved.

Starting in January 2014, SAUR joined the consortium as the lead private operator following a renegotiation of the contract among the parties. The obvious benefit of the enlarged consortium was that it allowed some cross-fertilization on the operational experience gained from 9 years of implementation of the AWSC management contract. Moreover, the introduction of SAUR brought an experienced international water operator at the helm of this challenging management contract in the three regions, one who could leverage on lessons learned from the implementation of the AWSC contract.

However, having several private players in the consortium had drawbacks, with higher transaction costs and some difficulties due to sometime occasional managerial approaches among the consortium partners.

Results and Key Factors

As with the other management and lease contracts, **there was progress on three key performance indicators**: average duration of daily water supply, bill collection rate and the share of customers having water meters (Table 10). Arguably though, these **improvements were of somewhat lesser magnitude than the improvements achieved for AWSC** in other cities and towns across the country.

Table 10. Key Performance Indicators of Nor Akunq, Shirak and Lori water utilities, 2009-2013

Indicator	Company	Measurement unit	2009	2015
Average duration of water supply	Nor Akunq	hour/day	21.14	23.54
	Shirak Water Sewerage		7.69	22.01
	Lori Water Sewerage		6.46	21.62
Water losses	Nor Akunq	percent	74.4%	67.5%
	Shirak Water Sewerage		82.3%	79.3%
	Lori Water Sewerage		70.3%	73.8%
Collection of fees	Nor Akunq	percent	100.0%	98.0%
	Shirak Water Sewerage		76.0%	98.0%
	Lori Water Sewerage		77.0%	99.0%
The share of customers having water meters	Nor Akunq	percent	97.0%	100.0%
	Shirak Water Sewerage		68.0%	94.0%
	Lori Water Sewerage		86.0%	98.0%
The number of employees per 1000 customers	Nor Akunq	people	10.40	6.40
	Shirak Water Sewerage		3.70	5.70
	Lori Water Sewerage		5.00	5.80

The performance in terms of labor productivity was disappointing. The labor productivity ratio improved in Nor Akunq, but much less than what was achieved by the AWSC management contract. It remained broadly the same in Lori, and even deteriorated further in Shirak. In line with the poor performance in labor productivity, salary costs represented a significant share of operating costs for the three companies, accounting for 48 percent of costs in Lori, 44 percent in Shirak and 24 percent in Nor Akunq (Annex 2) – underlying that little progress was made to control operating costs.

The improvements recorded for all three companies in customer metering and collection rate helped to boost revenues. Fee collection indicators reached 100 percent for all utilities within four years of the management contract (i.e. before SAUR took over).[20] However, these efforts were not enough to cover O&M or debt service costs. The utilities continued to depend on subsidies - to cover their operational and

[20] Significant improvement had been achieved under public management for the bill collection rate even before the start of the management contract, especially in Nor Akunq where it stood already at 100 percent in 2009.

debt service costs in the case of Nor Akunq for all the management contract duration,[21] and only to cover debt service in the case of Shirak and Lori during the last two years of the contract (Table 11) – even though the tariff level was higher than for towns in the rest of the country under AWSC.

Table 11. State Budget Subsidies to 3 Regional Water Utilities, 2009-2016 (million Armenian Dram)

	2009	2010	2011	2012	2013	2014	2015	2016 (Budget)
Total	**38.5**	**26.1**	**279.7**	**233.3**	**255.3**	**261.1**	**2,088.3**	**2,210.0**
Total USD (actual)	*105.979*	*69.850*	*750.872*	*580.695*	*623.245*	*627.765*	*4.369.560*	*4.624.205*
Operational	**38.5**	**26.1**	**46.4**	**0.0**	**0.0**	**27.8**	**66.3**	**98.5**
Debt service	0.0	0.0	233.3	233.3	255.3	233.3	2,022.0	2,111.5
Nor Akunq	38.5	26.1	279.7	233.3	255.3	261.1	299.6	331.8
Operational	38.5	26.1	46.4	0.0	0.0	27.8	66.3	98.5
Debt service	0.0	0.0	233.3	233.3	255.3	233.3	233.3	233.3
Shirak	0.0	0.0	0.0	0.0	0.0	0.0	1,031.8	794.5
Operational	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt service	0.0	0.0	0.0	0.0	0.0	0.0	1,031.8	794.5
Lori	0.0	0.0	0.0	0.0	0.0	0.0	756.9	1,083.7
Operational	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt service	0.0	0.0	0.0	0.0	0.0	0.0	756.9	1,083.7

Main Messages and Lessons Learned

The experience of the three regional utilities under municipal management underlines the challenge of turning around a publicly managed utility, when *inter alia* the political economy does not provide for sufficient barriers against political meddling and interference. **It did bring some tangible improvements, but the parallel – and more successful - implementation of the AWSC management contract provide an interesting point of comparison**, especially since the latter was not allocated as much funding for capex and technical assistance as the three regional utilities in their early years. The governance issues that existed under the municipal public management model were not entirely removed under the management contract, as local authorities continued to play a role. Nevertheless, the private consortium that took over was able to focus on improving the administrative, commercial and technical operations, with a level of attention not possible for municipal authorities.

The bundled management contract proved to be a good way to make the utilities attractive for private management, even though it initially attracted only the local private sector. It also allowed for economies of scale through a common investment program and operational approach. The later introduction of SAUR, which already operated the AWSC management contract, provided further opportunities for scale

[21] Nor Akunq had rather high operating costs, as the water supply system was dependent on pumping and electrical costs made up 16 percent of its operating costs, compared to 6 percent in Shirak and 9 percent in Lori.

economies. It also underlines again the flexible approach taken by the Government throughout the implementation of its water PPP reform, confirming its ability to adjust to evolving needs.

While continuity of water supply increased in this contract, the performance on water losses was weak, even more so than under the Yerevan lease contract and the AWSC management contract. Only in the case of Nor Akunq was there some reduction in NRW (by 10 percentage points, down to the still high level of 64.7 percent) while in the case of Shirak and Lori, the level of NRW actually went up. As in the other cases, this was the direct result of the steady improvement in continuity of water supply – and associated increase in average pressure of the distribution systems – combined with insufficient funds to rehabilitate old water distribution networks.

As in the case of the Yerevan and AWSC management contracts, there was no turnaround of the financial situation of the three utilities, despite the improvement in bill collection. The regional utilities continued to receive state subsidies despite significant tariff increases and a tariff level well above the one applied for AWSC in the other towns across the country (and by the lessee in Yerevan). Again, this shows that while management contracts can be efficient in improving some key aspects of service quality and operational efficiency, they are not necessarily well-adapted to improve the overall financial situation of a water utility – unless a Government is able and ready to carry out in parallel sharp tariff increases.

6. LESSONS LEARNED FROM THE FIRST GENERATION OF WATER PPPs (2000-2016)

Remarkable and sustained improvements were achieved over 16 years of PPP reforms

The water PPP reform in Armenia has clearly been a success. Private operators brought very significant technical and operational gains, as the four PPP contracts succeeded (even though in varying magnitude) in improving the service quality and operational efficiency of water services. Table 12 below provides an overview of the main operational results of the four PPP contracts. Annex 3 provides more detailed data on the key indicators for each water utility under PPP is provided on a year by year basis.

Table 12. Summary of Main Results of the First Generation of PPPs

	Yerevan Management Contract (2000-2005)	**Yerevan Lease Contract (2006 – 2016)**	**AWSC Management Contract (2004 – 2016)**	**3 Regional Utilities Management Contract 2009-2016**
Water supply continuity	From 4 to 18 hours/ day	From 18 to 23 hours/ day	From 6 to 18 hours/ day	From 12 to 22 hours /day
Electricity consumption	Decreased by 48%	Decreased by 82%	Decreased by 49%	N/A
Water losses (NRW)	N/A	83% → 75%	76% (2005) → 74% in 2015	85% → 77% (2015)
Bill collection rate	20% → 80%	80% → 97%	48% → 90%	84% → 98% (2015)
Share of customers with water meters	7% → 63%	87% → 98%	40% → 86%	84% → 96% (2015)
Tariff changes	**Pre-contract (1999)**: AMD 56/m3 ($0.10) **End-contract (2005):** AMD 125/m3 ($0.27) 170% increase	**Pre-lease tariff**: AMD 125/m3 ($0.28) **End of lease tariff**: AMD 170/m3 ($0.35) 36% increase	**Pre-contract 2003**: 66 AMD/m3 ($0.11) **End of contract** 2016: 180 AMD/m3 ($0.38) 245% increase	**Average in 2009**: $0.31/m3 **Average in 2016**: $0.44/m3 42% increase
Operating cost recovery	Net operating loss of $19.5 million	Net operating profit of $9.6 million net profit (after year 5)	Operational subsidy decreased from 100% to 56%	Operational subsidy increased by 155%

		No operational subsidy (except 2010)		
Capital expenditure	Total capex: $28 million Capex per capita per year: $4.7	Total capex: $68 million Capex per capita per year: $5.7	Total capex: $180 million Capex per capita per year: $24	Total capex (Shirak & Lori): $70 million Capex per capita: $30

There is no doubt that the Armenian population benefited from the implementation of the PPPs, in terms of improved reliability of water supply and elimination of intermittent service and water shortages. The continuity of water supply – measured as the average number of hours per day when water is available at the tap – went up significantly under the three management contracts from between 6 to 12 hours per day to about 18 hours a day. Under the lease contract, continuous 24/7 water supply has now been established in most of Yerevan and is well on its way for secondary towns and cities. The large improvements in energy efficiency of water systems also stands out as a remarkable success.

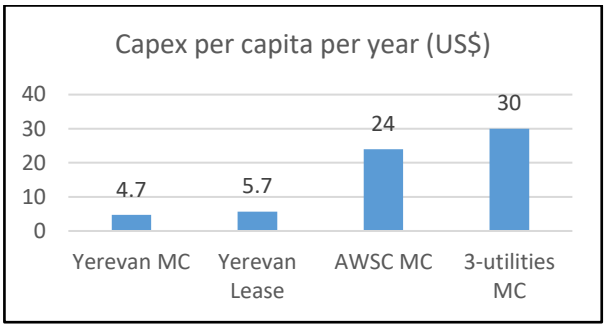
The overall success of the water PPP reform in Armenia has been confirmed by positive opinion polls – i.e. it is not just based on an expert's assessment. Several opinion polls have confirmed that a majority of customers are satisfied with services and showing no opposition to the presence of foreign operators under the existing PPPs - in contrast to the rather negative perceptions held in Armenia about the privatizations carried out in other sectors. For instance, in a 2011 survey of customers in Yerevan, only 30 percent of respondents wanted to revert to publicly-managed services rather than continue with a private water operator. On the same question, the result was 33 percent of AWSC customers. The Armenia story confirms earlier studies that demonstrated that PPP is a viable option for improving poorly performing water utilities in developing countries – provided it is properly implemented.

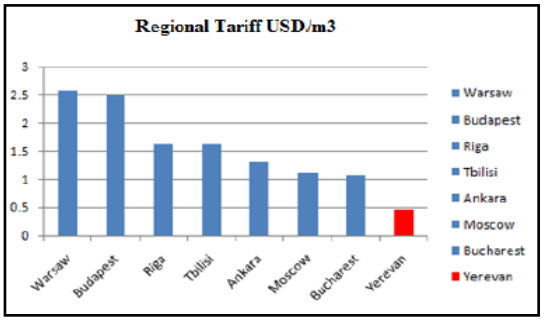
This improvement in water service quality was achieved in a cost-effective manner, with Armenia enjoying a level of **water tariffs amongst the lowest in the region** (between USD 0.35 and 0.45 per m3 in 2015). **In Yerevan, the lease contract succeeded to make water services fully self-financed by 2011**, with tariff covering all operating costs and debt services. Full cost recovery in Yerevan was achieved through **major efficiency improvements, both in operations and capital investments:**

- **In operations**: **energy efficiency was dramatically improved** and it is very likely that the carbon foot print and the country's imports of fossil fuels was reduced in a significant manner over the 16-year period of the water PPP reform. Major improvements were also recorded in **bill collection and labor productivity**. By 2015, most connections were equipped with meters and billing was based on actual consumption, resulting *inter alia* in a major increase in billed volumes and also a "fairer" way of billing customers. Equally important, customer orientation, sound operational practices and modern management were gradually established;

- **As for investments: the amount of capex that was spent successively through donor funding over the 15-year period was relatively moderate, considering the results achieved.** On a yearly per capita basis, the amount spent on capex stood at about USD 5- USD 6 in Yerevan (both under management and lease contracts). The capex allocated for the PPPs outside of Yerevan was significantly higher, at USD 24 per capita per year in AWSC management contract and USD 30[22] per capita per year for the 3-utilities management contract – reflecting the higher unit costs of serving smaller and less dense towns and settlements spread throughout the entire territory of the country (see Figure 12). The largest capex program was for AWSC, with investment through donors' lending reaching a total of USD 180 million over 12 years.

Figure 14: Yearly capex per Capita for the 4 PPP Contracts (donors financing only) & **Tariffs in Yerevan Compared to the Rest of the Region (2011)**





Key lessons: what are the main factors that explain this success?

It is important to reiterate that the success of water PPPs in Armenia was never a foregone conclusion – especially when considering that many developing countries that had initiated management contracts around the same period in the late 1990s or early 2000s (such as Venezuela, Lebanon, Jordan, Guyana, Trinidad, Ghana, Uganda, Zambia, Albania)[23] decided after a few years not to continue with PPP reform and went back to public management only. Clearly though, Armenia's success is not the result of chance: **there were several things that Armenia did well, when compared to how water PPP was implemented in other developing countries in the early 2000s.**

[22] The figure for the total amount spent by donors on investment in the 3 regional utilities of Shirak, Lori and Nor Akunq is actually under-estimated, as it does not include all amounts spent with KfW funding in the year between 2000 and 2008 when the utilities were under public management.

[23] These management contracts include Amman (Jordan), Georgetown (Guyana), Trinidad, Ghana, Johannesburg (South Africa), Uganda, Zambia mining towns, Tripoli (Lebanon), Lara and Monagas (Venezuela) and Durres (Albania). All these management contracts were developed at about the same time with donors' (especially the World Bank) support, followed a broadly similar design and contractual structure, and brought equally mixed results – with some aspects of performance being improved and others not.

Perhaps the most crucial moment in the water PPP reform in Armenia took place the end of the first PPP – i.e. the Yerevan management contract - when the **Government had to decide whether to continue with the PPP experiment, or to revert to public management.** While this first PPP did bring tangible improvements, it also failed to meet the Government's initial expectations, and the first two years of implementation had been quite difficult. While the overall results were slightly more positive than in many other management contracts tried elsewhere – the outcome was not radically different either.

The crossing-point of the Armenia water PPP experience was probably around the end of management contract in Yerevan, when the Government did not feel discouraged by the somewhat mixed results and challenges of implementation. As previously mentioned, instead of considering that with the Yerevan management contract the "glass was half empty" and PPP had failed to meet expectations, the Government took the view that the "glass was half full" and decided to stay the course. Recognizing the inherent limitations of a management contract – with limited transfer of risks and responsibilities to the private operator under a relatively short duration – it did not end the PPP experiment but instead decided to take it to a new level, shifting in 2006 to a 10-year lease contract in Yerevan, and also expanding management contracts to the country in preparation of another switch to a lease model later on.

One possible reason for this more positive attitude towards water PPPs was that popular sentiment against foreign private companies was maybe less pronounced than in some other developing countries. Armenia, a land-locked country with a dramatic history, was open to international engagement and eager to develop closer links with the West. Its openness to outside advice, and willingness to first study concrete experiences from other countries, proved wise as it shaped realistic expectations about what an initial PPP could achieve. The decision to defer the management contract for AWSC until after early lessons could be learned from the Yerevan contract underscores this sober and realistic attitude.

Throughout the 16 years of water PPP reforms, the Government of Armenia's commitment to acting as a true partner to the private operator was essential. This commitment was not merely stated but was demonstrated through multiple concrete actions that helped the PPPs to succeed. The extensive measures taken ahead of the first management contract made the conditions for partnership with the private sector favorable for success (e.g. for customer debt relief and restructuring the debt-ridden companies). The role of SCWE as an efficient public counterpart was also essential, due to a combination of factors. It had strong and constant leadership, with the same Chairman at the helm for most of the first generation of PPPs, thus providing stability and fostering trust with the private operators. As the PPPs evolved, the Government proved to be flexible, amending contracts when needed and performing its monitoring functions with the support of an Independent Technical Auditor.

Another major benefit of the water PPP reform in Armenia was the adoption of a sequenced approach - both for expanding the geographical scope of PPP, and for transferring risks and responsibilities to the private sector. Armenia is quite unique amongst developing countries for having adopted such gradual strategy, but it ended up paying off handsomely. It allowed the government to gradually build capacity on how to design and implement PPPs, learning on the way and adjusting to lessons learned. A measured approach also allowed tariffs to increase in a gradual manner, in parallel with improvements in service quality so as to reduce potential opposition from the population and keep momentum for the reform. In

the case of Yerevan, starting with a management contract before transitioning to a lease contract also turned out to be a good move: it allowed a reliable database to be built first and reinforced the Government's capacity to interact as a strong public counterpart. Consequently, there were lower risks for the private sector to bid on the lease when the tender was carried out in 2005 and resulted in more favorable financial offers from bidders than if the lease had been initiated immediately in 2000. The phased approach also proved key for ultimately achieving full cost recovery in Yerevan while keeping the water tariff at a low level compared to regional benchmarks.

The gradual approach adopted for water PPP in Armenia also shows **that the common belief that establishing an appropriate institutional framework is a pre-requisite for a successful water PPP is largely misplaced**. While the Government did implement major reforms during the first years of PPPs, the first management contract in Yerevan was launched in 2000, well before the new national Water Law (2002) was enacted, the national regulator put in place (2003) and almost all new legal acts required (e.g. on metering and debt collection) were passed. Instead of a dogmatic view of water PPP reform, Armenia choose the practical way: **had the country tried to put in place, first and before starting a first PPP, all the new laws and reforms that would be necessary for PPP to succeed, it may have lost the whole momentum for reform**. The experience of Armenia indicates that reform should be viewed as a gradual process, and that putting in place (and fine tuning) the appropriate institutional framework can be done in parallel with the implementation of PPPs – rather than completed beforehand as a pre-requisite.

Leaving the private operator in charge of implementing capital expenditure, and providing it flexibility on investment decision and supervision, **while the government was responsible for financing investment, is a rather specific feature of the Armenia water PPP experience, and proved crucial for success.** The private operators had direct incentives to use the limited funds available for investment in an efficient manner, focusing on those actions that had the maximum impact on service quality and operational efficiency, and ensuring that procurement and civil work was carried out in a diligent manner. This allowed the various PPPs to achieve remarkable results in improving service quality and efficiency, despite the fact that the overall amount of funds allocated by the Government to support investment under the PPP reform was quite modest by international standards.

The mixed results on achieving financial sustainability of the water companies largely reflects political decisions linked to water tariff levels, rather than poor performance of the PPP approach. The successive PPPs have eased the financial burden of the water sector on the Government's budget and improved creditworthiness in a general manner. However, only in Yerevan have water services managed to achieve operational cost recovery, and this took more than a decade (starting in 2011). This was achieved under a lease contract whereby tariff level had been set as a result of the tender process, with the private operator taking a calculated risk that such tariff would ensure full cost recovery after efficiency improvement were carried out. AWSC and the regional utilities remained dependent on subsidies to cover their operating costs: even though the Government had allowed tariff increases in all cases, these were insufficient to ensure full cost recovery. The two key lessons here are that:

- **A management contract alone is not by itself sufficient to achieve full cost recovery**, unless the government is willing to take the necessary measures to raise tariff levels so as to accompany the expected improvements in bills collections and operational costs reduction;

- **A lease can be more efficient than a management contract in promoting a move to self-financing sustainability** of the water sector – as the private sector has sharper incentives, and more flexibility and responsibilities for operating the system with the tariff set through the tender process. This has also been illustrated in water PPP reforms in other developing countries, as in Senegal and Niger where in both cases a private operator was able to bring service quality to international levels and achieve full cost recovery through tariff revenues after about a decade[24];

All four PPP contracts have highlighted the difficulty of addressing non-revenue water, which remains stubbornly high even after 16 years of presence of a private operator in Yerevan. The NRW level still ranges between 70 percent and 90 percent depending on the service area. While this could appear at first as a set-back, the review of individual PPPs showed that this was largely due to the fact that the private operators were concentrating on reducing intermittent supply – i.e. increasing the average number of hours when water was available at the tap – which also had the direct negative effect of increasing the average pressure in the network and thereby the level of leakages. While the private operators did take actions to reduce leakages – such as with district zoning and installing pressure valves – the fact that only a limited amount of funds were available under the capex program to rehabilitate the distribution network did not allow to achieve more than keeping the NRW at the same level (but with increased average pressure). Another important element is that as water resources in Armenia are cheap and plentiful, and the private operators also took major actions to switch distribution networks towards being gravity-fed, there were considerably fewer incentives and financial/economic benefits to investing in leakage reduction.

The Armenia PPP experience also highlights the **importance of designing "smart" incentives for getting results under PPPs**. The private sector is driven by clear financial incentives, and it is essential that these incentives are properly designed in the contract to guide the private operators' behavior towards what a Government wants in terms of improvement. In this context, the incentives framework applied in Armenia gradually evolved as lessons were learned. The large number of contractual KPIs under the first management contract in Yerevan was reduced in the AWSC and three cities management contracts. While remuneration under the first management contract in Yerevan was largely based on a fixed management fee (reflecting the high risks associated with the first water PPP contract in the country), the AWSC management contract introduced more variable payments but also established a cap for bonuses and penalties (at respectively +25 percent and -20 percent of the fixed fee) - acknowledging the risks associated with having to turn around water services scattered across the entire territory of the country. Another insight from Armenia's management contracts is that it is advisable to start with bonuses when there is significant risk to attract operators, but then move on to penalties once better services have been

[24] This was achieved, though, with a higher tariff level than in Armenia. And a few other cases of lease contracts, the PPP reform failed, as in the Maputo lease in Mozambique and the Dar el Salam lease in Tanzania (2003-04).

established. The adoption of an "enhanced lease" structure for the second PPP in Yerevan sharpened the incentives structure and was key to the good results achieved over a decade.

Finally, continuous donors' support proved crucial for the success of the water PPP reform in Armenia. The PPP results were the fruit of a sustained partnership not just between the Government and private operators, but also between the Government and donors. Donors financed most of the investment carried out under the PPP contracts as well as funding for preparation of PPPs, staff retrenchment and remuneration of the operators under the management contracts. This was not just about providing funds. Technical assistance, provided through regular supervision of donor-financed investment projects through donors' regular missions and visits, was also important. Technical support was especially important as SCWE was open and eager to seek advice based on international experiences in order to deal with the inevitable challenges encountered throughout the implementation of the PPPs. In the early years, the World Bank played a leading role in this process, gradually withdrawing after more than a decade as the reform became more mature and other donors were willing to step in and take over for the second generation of water PPPs.

7. THE SECOND GENERATION OF WATER PPPs: NATIONAL LEASE CONTRACT SINCE 2016

Addressing Remaining Water and Wastewater Challenges

As the three PPP contracts in Yerevan, AWSC and the 3 regions were drawing to a close, the Government started as early as 2013 to review its options for the next phase. As the validity of working with private operators had by then been solidly demonstrated, it was keen on pursuing the PPP reform through a "second generation" of contracts that would expand the role of the private sector - but it was not clear what form this would take. While the first generation of PPPs had resulted in considerable gains, there was still a need to improve continuity of water supply, quality of services, efficiency of water resource management and financial viability, especially outside of Yerevan. Considering what had already been achieved under the various PPPs, the Government faced three different challenges:

- **In Yerevan**: how to sustain the remarkable gains achieved over 16 years of efforts under the successive management contract (2000-05) and lease contract (2006-2016) - especially in terms of achieving self-financing of the sector - while also continuing with further improvements in areas not previously or fully addressed (e.g. NRW reduction, wastewater treatment);
- **In towns and cities across the rest of the country** (covered by AWSC and the 3 utilities in Shirak, Lori and Nor Akunq): how to consolidate and further enhance the gains achieved under the two management contracts – especially for reaching continuous 24/7 supply nationwide – and how to phase out government subsidies and move to financial sustainability as happened in Yerevan?
- **In the 579 smaller settlements that were left outside of the PPP reform and lacked proper water systems**: what to do in order to improve access to piped water for this population in a sustainable manner - either by gradually incorporating them under the new lease or through other schemes?

This last point was particularly critical, as the population in these 579 villages is estimated to represent about 650,000 people (about one quarter of the country's population), who were not covered by the PPP reform and therefore did not benefit from it. They are mostly located in remote and poor areas, and did not receive water and sanitation services from any formal providers. Some villages relied on local schemes with distribution through rudimentary pipes or community standpipes. Others relied on water trucks. Because disinfection is not a common practice in these areas, they face a high risk of water contamination (although in the absence of monitoring, incidences of bacteriological pollution is not well documented). Local village organizations typically carry out some basic form of operations and maintenance with little outside support - and tariffs charged are either inexistent or very low.

The decision-making process leading to the choice of a single national lease involved extensive consultations with stakeholders, including drawing on donors' experiences elsewhere. Many options were reviewed,[25] and the Government finally leaned towards a single national lease contract, that would

[25] For instance, moving to a concession in Yerevan and a lease for the rest of the country was also considered as an option (in which case the operator would finance all capex from tariff revenue) - but this was dependent on the

combine the service areas of all utilities served by the previous PPPs: Yerevan, towns and villages served by AWSC, and the three utilities in Shirak, Lori and Nor Akunq. The main advantages of this approach were twofold. First, it would allow for economies of scale by having only one private operator, both in terms of operating costs for the operator, and supervision costs for the Government. Second, it would result in a single national water and sanitation tariff for the whole country, allowing for cross-subsidization between Yerevan (where the unit operating cost was lower and which already benefited from better services) and the rest of the country (which had higher operating costs on average, more needs for investment and improvement, and a higher incidence of poverty). Given the relatively small size of Armenia, the national lease contract would still serve a total population of just about 2.2 million – which was not excessive by international standards. The main downside of this "single national PPP" approach was that the Government would lose the "competitive edge" that it had enjoyed so far by having different private water operators in the country – but providing that the contract was awarded to a truly competent operator and regulation could be properly carried out, this disadvantage was considered manageable.

By mid-2014, the final decision to go with a single national contract had been made and the Government issued two decrees[26] stipulating that after the expiration of the first set of PPP contracts, a single lease operator would be selected on a competitive basis. The plan was to transfer the right to operate water systems and other property then operated by Yerevan Djur, AWSC, Lori WSC, Shirak WSC and Nor Akunq WSC to one private water operator for 15 years. A single tariff would be established for water supply and sanitation services throughout the country, effectively expanding the geographical cross-subsidies, already in place between the secondary cities, towns and villages served by AWSC, to include cross subsidies between Yerevan (as well as the three regional utilities) and the rest of the country.

Tendering and Contract Terms

As with the previous PPP contracts, **donors provided the funding and technical support necessary to prepare and carry out the tendering process.** EBRD provided a grant to finance the recruitment of three international consulting companies that would help organize the tender. The PPP transaction advisor was Fichtner (Germany) in association with AVAG Solutions (Armenia). Two other international consulting firms were recruited: one engineering firm to carry out the technical audit of the water companies and one accounting firm to provide support for property registration, evaluation and cadastral registration. Annex 4 provides more details on the tendering process.

The package of tender documents specified that **the future lessee would not receive any operating subsidies during the lease contract**, which meant that the future national tariff for water and wastewater services were expected to cover all operation and maintenance costs in full. The successful bidder had to meet the technical evaluation requirements and submit the lowest tariff for water supply and sanitation services. **The lessee has an obligation to pay a lease fee of AMD 89.75 billion (about USD 190 million) over the duration of the 15-year contract**, based on a contractual schedule of payments (two installments

future pricing policy and the availability of long-term debt financing in local currency (for a concession in Yerevan). It would have required significant new increases in tariff levels which may have been rejected by the population.

[26] RA Government Decrees N 883-N and N 888-N dated 14 August, 2014

in each year of the contract). The lease payment schedule was set up so as to cover gradually the loan servicing costs of the five water supply companies - up to 25 percent of the water companies' loan servicing costs in 2017, and reaching 100 percent after 8 years (i.e. by 2025).

The national lease contract is structured as an "enhanced lease", continuing the successful approach followed previously with the Yerevan lease. It defined minimum levels of mandatory capital works program (MCWP) for each contract year, with **the lessee having an obligation to finance from his own funds a certain amount of mandatory capital spending** with an annual average of AMD 2.5 billion (about USD 5 million per year), which is equivalent to about 12.5 percent of total capex for the whole contract duration. The contract also introduced **four priority KPIs - continuity of supply and water quality** which were already tracked under previous PPPs, **plus two new indicators for NRW [27] and consumer satisfaction**[28] - with penalties to be paid in case targets are not met. There are also a large number of Internal Benchmarking Indicators (IBI) which are not subject to penalties[29]. Performance monitoring continues to rely on independent technical auditors. With the introduction of NRW as a KPI with penalties and the rather aggressive schedule of KPIs improvement targets means, **the incentive structure of the new national lease has been significantly sharpened compared to the previous Yerevan lease**.

Relative responsibilities for implementation of capex between the private operator and SCWE have been modified under the new national lease. In a significant departure from the previous PPPs, the Government – through SCWE as Lessor– will be taking back control of the execution of most of the investment program financed with public funds.[30] While this is the typical approach under a standard lease contract, it represents a major change compared to the approach that had been followed under the Yerevan lease and AWSC management contracts, where the private operators were given significant flexibility for the identification, design, tender and supervision of civil works and other investments. It is important to note that by taking over the capex execution responsibility, **the Government is modifying the risk balance of the PPP, and by gaining more control is also effectively taking more risks.** Untimely execution of the scheduled capex by SCWE would become its responsibility and since it would also likely affect the financial equilibrium of the lease (as some cost reductions expected through upgrading investments would be delayed), this could lead to a call for renegotiation by the private operator. The position of SCWE is that it preferred to regain more control on investments since it considered that it had gained sufficient capacity to be able now to carry out capex functions efficiently on its own.

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[27] Compared to the 2017 baseline level, the contractual targets for NRW under the new national lease call for a reduction of 3 percentage point for each of the first 4 years, a reduction of 18 percent by year 8, and of 30 percentage points by the end of the contract.

[28] Previous contracts focused on reaction time to customer enquiries/ complaints. The Independent Technical Evaluator will conduct an annual customer survey on the quality of water services provided by the operator. The first survey should be available in 2018.

[29] Including for sanitation services e.g. treated water quality.

[30] The contract still specifies that the Lessee should be involved in the planning, design and development of tender documents for the award of contracts for works, services and goods. It also states that international financial institutions (IFI) can request it to undertake the design, specification, procurement, supervision and commissioning of the works, after agreement on the terms of compensation, as well as to support tendering and supervision.

During the tendering process, **four consortia were initially pre-qualified but in the end only two companies submitted a full bid** - Veolia (which had been successfully operating the lease contract in Yerevan for the previous 10 years) and an Armenian-Russian consortium. As its technical bid was the only one considered satisfactory, Veolia was awarded the lease contract with a financial offer that was also deemed acceptable. The contract was signed on 21 November 2016 and was set for 15 years. The new national water operator was formally established as Veolia Water CJSC.

After the award of the lease contract, Veolia Water applied for a formal tariff approval to the PRSC. The PSRC approved the tariffs in December 2016, which have been in force since January 1st 2017. **The overall tariff for retail water supply and wastewater treatment services was set at 180 AMD/m3 – equivalent to about USDD 0.37 per m3 -** inclusive of VAT for all the country. Of this amount, 85 percent is for water supply and 15 percent for sewerage services. This tariff level represents a reduction for customers outside of Yerevan, and remains **amongst the lowest in the region** (Table 13).

Table 13. Water and Wastewater Tariff under the National Lease Contract, 2017, AMD/m3

	Item	Tariff	
		excl. VAT	incl. VAT
1	**Overall tariff for retail water supply and sewerage (wastewater treatment) services, of which:**	**150.00**	**180.00**
1.1	**for water supply services**	**127.50**	**153.00**
1.2	**for sewerage (wastewater treatment) services**	**22.50**	**27.00**
2	Services for removal of underground water	9.00	10.80
3.1	Bulk water supply services	30.00	6.00
3.2	Bulk sewerage services	15.00	18.00

Source: PSRC (approved by PSRC decree no. 398N dated December 09, 2016)

A noteworthy element of the lease tender is that it introduced the concept of "affordable tariff'. The Government's latest development program (2014 – 2025) requires that drinking water charges should not exceed 2.5 percent of consumer spending in the poorest quintile of the population, given an estimated daily consumption volume of 70 liters per capita. The PPP transaction advisor carried out an assessment of tariffs based on a financial model developed for this purpose, to ensure that the financial offers would meet that criteria (see Box 4). The tariff level with which Veolia won the tender of the national lease does meet the national water affordability threshold, which is also much stricter than the affordability threshold typically applied in other countries – meaning that **affordability for the poor should be ensured**.

Box 4: Introducing a tariff threshold in the tender evaluation of the national lease

According to 2014 household survey data, consumer spending in the poorest quintile of the population was AMD 15.7 (USD 37.8) per capita, and the maximum affordable drinking water tariff was 187 AMD (USD 0.45)/m3[31]. An affordable tariff forecast for the coming years was carried out based on the assumption that consumer spending in the poorest quintile of the population would increase annually by 4 percent per capita.

It should be noted that international standards normally use lower requirements for the affordable tariff than the one adopted in Armenia. For example, the United Nations Development Programme (UNDP) recommends that for a tariff to be considered affordable, the charges for drinking water should not exceed the median of 3 percent of household income. Based on the 2014 household survey data, the affordable tariff by UNDP standards was 542 AMD (USD 1.11) per m3[32] - well above the current tariff level under the three PPPs and the national tariff that would result from the tender of the national lease.

[31] The calculation was done as follows (AMD 15,742 x 2.5%) / 2.1 cubic meters = 187.4 drams / cubic meters, where 2.1 cubic meters is obtained by multiplying 70 liters on 30 days (source of information: "Social Snapshot and Poverty in Armenia", Statistical Analytical Report, RA NSS, Yerevan, 2015).

[32]The calculation was done as follows: (AMD 37,927 x 3%) /2.1cu m.=541.8 dram / cu m., where the median income is 37,927 drams, which is equal to the arithmetic mean of the income of 5th and 6th quintile groups: 37927 = (34774 + 41080) / 2, and 2.1 cubic meters is obtained by multiplying 70 liters on 30 days (source of information: "Social Snapshot and Poverty in Armenia", Statistical Analytical Report, RA NSS, Yerevan, 2015).

8. CONCLUSION & LOOKING FORWARD

The long and generally successful story of Armenia's water PPPs offers a wealth of knowledge and lessons for those interested in using PPPs as a delivery model for improved water services. Armenia's experience is remarkable for a number of reasons. First is the diversity of contracts, including a classic management contract, a lease and a bundled management contract for three service areas. The second is the success (to various degrees) of each contract. While O&M cost recovery did not materialize except for Yerevan, and water losses remained very high, these results reflect policy choices (tariffs and investment funding) rather than fundamental flaws in the PPPs themselves. Third, the evolution in PPPs illustrates the benefits of learning from experience. Lastly, Armenia is one of the few countries in the world with a significant proportion of its population (about 75 percent) receiving water services under private provision over many years. Armenia is also distinct because the foreign private water operators have been well accepted by the population, a feat that is difficult to reach in many other countries.

While Armenia's 16 years of PPP experience has largely been positive, **the implementation of the new national lease contract begins a new phase, with a greater transfer of risks to the private sector and also to the Government which is now responsible for the capital program**. For the Government, having to deal with one single private operator instead of several as in the previous reform will also represent an important change. **Three issues deserve highlighting at this stage, since they will need to be prioritized for the second phase of the water PPP reform in Armenia to continue bringing sustained benefits to the country**:

The timely implementation of the scheduled capex scheduled will be critical

According to the "Water Supply and Sanitation Strategy and Finance Program" approved by the RA Government in August, 2015, the total investment costs for water and wastewater systems for 2017-2032 are estimated at AMD 300 billion (about USD 628 million, or **about USD 42 million per year**). Of this amount, AMD 262.5 billion (87.5 percent) should be from state investment and AMD 37.5 billion (12.5 percent) from investments made directly by the lessee for the whole contract duration).

In order to finance the investment program under the national lease contract, **donors have committed so far to provide USD 200 million for the first 5-year period**. The timely execution of this investment program is essential for the private operator to be able to build on the successful results already achieved in Yerevan to the rest of the country, and meet the performance improvement targets under the contract's KPI (NRW and service continuity). It is also **essential for maintaining the financing equilibrium of the lease**, since a portion of it will be directed at investments to improve operational efficiency, and the private operator made its financial offer in the tender (i.e. level of national tariff) based on the expectation that operating costs could be reduced in part due to these new upgrading investments.

At the early stage of the national lease contract, ensuring that all funding committed by donors will materialize, and the capex program will be implemented by SCWE in a timely manner, remains a critical issue. Enhanced donors support for capacity building may be necessary to ensure that SCWE has the capacity to carry out this new responsibility in a diligent manner. Uncertainties regarding the evolution of the Government's fiscal situation may create some challenges to finalize all required borrowings.

How to provide improved water services for the remaining 650,000 people in unserved communities?

The design of the second generation of water PPPs took into account the challenge of the remaining 650,000 people living in remote settlements (579 villages) who were left out so far from the benefits of the reform. The lease contract stipulates that **the private operator has an obligation to incorporate, upon SCWE's request, new settlements into its service area each year up to a total of 20,000 additional people,** without the need for renegotiation of the financial terms. However, as of January 2017, there was not yet a clear policy or strategy on how the incorporation of these unserved communities would happen.

One key limitation is that while these remote settlements currently receive poor water supply, the population also for a large part pays nothing or a very low amount (except for those served by trucks). As these remote areas tend to have a high poverty rate, **it is unclear whether these rural populations would easily accept to become incorporated into the service area of the private operator and start paying the new national water tariff in exchange for better service**. Furthermore, for the communities to agree, significant investment in systems rehabilitation and expansion would be required - considering the typically high unit costs of small remote settlements. As funding is the responsibility of the Government, the uncertainty about funding may end up jeopardizing the policy objective of achieving financial self-sufficiency for the water sector by 2025.

A new EUR10 million KfW grant from the EU-NIF has been earmarked to incorporate about 30 villages in the short term. The villages were identified based on technical feasibility and the willingness of residents to join the national service area - but the question of what to do with the remaining majority of villages remains open. **For the poorest settlements, provision of improved services through community standpipes may remain a more viable solution at a first stage**, or an operational subsidy may be needed in case individual household connections are chosen. An alternative to option to explore would be to promote some form of contractual technical assistance between the private operator and some of the village communities, for critical operational processes such as for instance chlorine disinfection. This arrangement could allow a domestic private sector to gain competence in water operations, which is important for the country over the long term.

How to expand wastewater collection and treatment in a sound and sustainable manner?

Investment in wastewater treatment was largely left out during the first 16 years of water PPP reforms in Armenia, in recognition that more urgent priorities had to be tackled first. It is to be hoped that, under the new national lease contract, the country will be able to start investing in wastewater collection and treatment, at least regaining the level of wastewater treatment achieved during the time of the Soviet Union, when secondary treatment was available in Yerevan and a number of other secondary cities. There are nascent signs that progress has already started, as the new wastewater treatment plant (WWTP) in Yerevan is expected to start operation during 2017 – restricted at first to primary treatment only – and some donors have expressed interest in financing new WWTPs in secondary cities.

Figure 15: the new wastewater treatment plant in Yerevan (source Veolia, with permission)

While more emphasis on wastewater treatment in the future is a welcome development for the protection of water resources in the country, expectations on how far wastewater treatment can go should be tempered. The environmental and health benefits should not distract from the fact that wastewater treatment is costly, not just in terms of investment but even more in terms of O&M. In addition, realistic goals should be set, bearing in mind that secondary treatment of effluent may need to be deferred until a later stage when the economic case for it is stronger. The experience of the implementation of the Urban Wastewater Directive in the EU, with many countries from Central and Eastern Europe experiencing major difficulties for compliance, underlines the many challenges involved. **Armenia is still far away to have achieved a level of economic development that makes implementation of wastewater water treatment affordable on a large scale**.

In this context, it will be essential for donors to maintain a sound policy when considering investing in new WWTPs in Armenia, considering in particular than any new WWTP will represent a financial burden in terms of O&M costs, and that this will need to be paid for by the population through tariffs under the national lease contract. **Future funds for WWTP investment should therefore be focused where they can have the maximum environmental and public health impact** (i.e. on pollution hot spots such as around Lake Sevan). In all cases, new WWTP investments will need to ensure that the utility will have the sufficient financial means through tariffs to finance sustainable O&M. In this context, the development with donors' support of a national wastewater treatment program could be a positive first step.

Annex 1. Operational and Financial Results of the Yerevan Lease Contract

Table (i) Yerevan Djur Operational Indicators during the 10-Year Lease Contract

Yerevan Djur	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Hours of water supply/ day		19.7	17.4	18.9	20.4	20.8	22	22.2	22.5	22.7	22.9
Water supplied to network, 1000 m3	**353630**	**355595**	**368834**	**372114**	**362825**	**346211**	**319520**	**307322**	**292723**	**284250**	**273142**
By Gravity, 1000 m3	212188	213401	227895	229502	226003	225951	237593	233716	224297	216673	212581
By Pumps, 1000 m3	141442	142193	140938	142612	136822	120260	81927	73606	68426	67577	60561
Water losses, 1000 m3	**291807**	**298380**	**313416**	**312623**	**307313**	**289220**	**259253**	**245297**	**228823**	**218025**	**204150**
Water losses, %	**83%***	**84%**	**85%**	**84%**	**85%**	**84%**	**81%**	**80%**	**78%**	**77%**	**75%**
Water billed, 1000 m3	**63837**	**57214**	**55418**	**59491**	**55513**	**56992**	**60267**	**62025**	**63900**	**66225**	**68993**
Households, 1000 m3	39400	34931	31491	33162	33745	34968	36419	37693	39460	40320	41311
Government organizations, 1000 m3	5332	5485	4919	4862	4366	4311	4152	4189	4297	4372	4463
Commercial customers, 1000 m3	17092	14691	16933	17695	15883	16524	17960	18187	17552	19287	20979
Bulk water customers, 1000 m3	2014	2107	2074	3773	1520	1190	1735	1956	2590	2248	2241

Table (ii). Yerevan Djur CJSC's financial results for 2006-2014, mln. AMD

Mln. AMD	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Revenue	**4,537.33**	**6,959.65**	**7,526.66**	**7,908.33**	**9,138.98**	**9,114.44**	**8,862.23**	**9,024.48**	**9,521.36**
Revenue (from core activities) without VAT)	4,396.98	6,920.24	7,434.60	7,708.84	8,662.52	8,803.37	8,650.63	8,824.38	8,994.61
Other revenue	140.35	39.41	92.06	199.49	476.45	311.07	211.60	200.09	526.75
Total expenses from core activities	**4,938.11**	**7,938.49**	**7,808.82**	**8,401.68**	**8,213.86**	**8,142.04**	**7,962.65**	**7,335.43**	**8,316.28**
Operations and maintenance expenses	3,093.47	5,333.50	5,223.81	5,947.17	5,917.74	5,687.33	5,326.37	5,789.85	6,516.40
Salaries, bonuses and equivalent	1,393.51	2,577.39	2,382.50	2,852.57	2,950.06	2,923.34	2,768.03	2,959.54	2,868.92
Materials	222.12	365.63	415.20	385.50	412.44	524.76	512.67	422.12	355.22
Electricity	1,031.60	1,755.09	1,762.64	1,928.72	1,628.43	1,039.67	738.89	667.15	683.15
Amortization	218.34	324.83	216.28	359.61	477.69	577.11	703.89	1,137.33	1,776.87
Current repair expenses	227.92	310.57	447.20	420.78	449.12	622.46	602.89	603.70	832.23
General and Administrative expenses	739.80	1,697.71	2,520.77	2,083.16	2,040.76	2,702.05	2,501.89	1,417.15	1,692.84
Financial expenses	1,104.84	907.27	64.24	371.35	255.36	-247.33	134.39	128.43	107.04

Total operational profit/losses	**-400.78**	**-978.84**	**-282.16**	**-493.35**	**925.12**	**972.40**	**899.57**	**1,689.05**	**1,205.08**
Profit/losses in % of revenues	**-8.8%**	**-14.0%**	**-3.8%**	**-6.2%**	**10.1%**	**10.7%**	**10.0%**	**18.7%**	**12.7%**
Total operational profit/ losses (USD millions)	**-0,96**	**-2,86**	**-0,92**	**-1,36**	**2,48**	**2,61**	**2,24**	**4,12**	**2,90**
Net operating profit: USD 4,1 million before taxes or about USD 0.45 million per year on average over the contract									

Annex 2. Tendering Process for AWSC Management Contract

The Management Contract Tender for Transferring ''Armenian Water Sewerage Company'' CJSC's Executive Powers to the Private Manager

The first phase of the management contract was signed with the firm on 19 August 2004, and it was launched on 19 October, 2004. According to the terms of management contract, the breakdown of fixed payments per year were as follows: 1st year - 23 percent, 2nd year – 21 percent, from 3rd to 6th years - 14 percent each. Besides the fixed payment, according to the management contract, based on the performance indicators outcome results, USD 1.3 million incentive fee was intended for the manager through yearly payments beginning from the second year. The Loan Agreement and the Project Agreement were signed between the IDA and the Republic of Armenia on 14 June 2004 for USD 25.56 million.

Table 1. Investments by type for Selected projects in AWSC area

Type of Civil Works done	Unit	ADB Financed Water Supply and Sanitation Sector Project, Loan 2363-ARM		ADB Financed Water Supply and Sanitation Sector Project - Additional financing, Loan 2860-ARM		WB Financed Municipal Water Project, Loan: 8129-AM		Total		
		Scope	Amount /mln USD/	Scope	Amount /mln USD/	Scope	Amount /mln USD/	Scope	Amount /mln USD/	%
Water Mains	km	120.0	5.93	42.0	1.88	8.0	0.38	170.0	8.19	9.40%
Network	km	590.0	23.49	896.0	29.97	186.0	6.5	1672.0	59.96	68.84%
House Connections	km	205.0	2.05	245.0	2.45	70.0	0.7	520.0	5.2	5.97%
Water Meter Chambers	pcs	24304	1.94	32870	2.96	9728	0.78	66902	5.68	6.52%
Pumping Stations	pcs	15	1.52	6	0.35			21	1.87	2.15%
Chlorination Stations	pcs	4	0.07	5	0.12			9	0.19	0.22%
Regulation Reservoirs	pcs	35	2.02	30	1.65	4	0.29	69	3.96	4.55%
Water Plants	pcs	2	1.22	1	0.02			3	1.24	1.42%
Sources	pcs	9	0.21					9	0.21	0.24%

Deep Wells	pcs	9	0.36			2	0.15	**11**	**0.51**	**0.59%**
Sewerage	km	4.4	0.09					**4.4**	**0.09**	**0.10%**
Total			**38.9**		**39.4**		**8.8**		**87.1**	**100%**

Annex 3. Detailed indicators for the five utilities

1.1 Water production and consumption structure by companies

Yerevan Djur CJSC

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Hours of water supply/ day		19.7	17.4	18.9	20.4	20.8	22	22.2	22.5	22.7	22.9
Water entered into water supply system, 1000 cu. m.	**353 630**	**355 595**	**368 834**	**372 114**	**362 825**	**346 211**	**319 520**	**307 322**	**292 723**	**284 250**	**273 142**
Gravity water, 1000 cu. m.	212 188	213 401	227 895	229 502	226 003	225 951	237 593	233 716	224 297	216 673	212 581
Mechanical water, 1000 cu. m.	141 442	142 193	140 938	142 612	136 822	120 260	819 27	736 06	684 26	675 77	605 61
Total water losses in the system, 1000 cu. m.	**291 807**	**298 380**	**313 416**	**312 623**	**307 313**	**289 220**	**259 253**	**245 297**	**228 823**	**218 025**	**204 150**
Water losses, %	**83%**	**84%**	**85%**	**84%**	**85%**	**84%**	**81%**	**80%**	**78%**	**77%**	**75%**
Water supply, 1000 cu. m.	**638 37**	**572 14**	**554 18**	**594 91**	**555 13**	**569 92**	**602 67**	**620 25**	**639 00**	**662 25**	**689 93**
Population, 1000 cu. m.	394 00	349 31	314 91	331 62	337 45	349 68	364 19	376 93	394 60	403 20	413 11
Budgetary organizations, 1000 cu. m.	533 2	548 5	491 9	486 2	436 6	431 1	415 2	418 9	429 7	437 2	446 3
Other, 1000 cu. m.	170 92	146 91	169 33	176 95	158 83	165 24	179 60	181 87	175 52	192 87	209 79
Water sold to other water supplying companies, 1000 cu. m.	201 4	210 7	207 4	377 3	152 0	119 0	173 5	195 6	259 0	224 8	224 1
Water removal, 1000 cu. m.	**706 42**	**589 24**	**564 59**	**617 80**	**612 10**	**626 05**	**635 96**	**658 65**	**679 23**	**694 43**	**719 73**
Population, 1000 cu. m.	319 72	289 70	267 74	283 56	291 57	304 45	322 04	343 64	360 66	366 72	374 71
Budgetary organizations, 1000 cu. m.	466 1	478 1	409 5	405 3	386 8	385 3	371 0	375 4	382 5	379 6	403 6
Other, 1000 cu. m.	340 09	236 83	143 37	180 23	169 50	170 03	167 94	172 90	178 08	189 93	203 84
Water removal of other water supplying companies, 1000 cu. m.	0	149 0	112 53	113 48	112 36	113 04	108 88	104 57	102 23	998 2	100 83

Armenian Water and Sewerage CJSC

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Hours of water supply/ day	7.39	9.62	10.98	12.1	13.01	14.03	15.02	16	16.61	17.02	18
Water entered into water supply system, 1000 cu. m.	**165875**	**168281**	**178057**	**188983**	**182231**	**172792**	**159975**	**160267**	**155818**	**142523**	**145729**
Gravity water, 1000 cu. m.	86503	91102	94631	98233	104483	107670	98859	100527	99937	84344	86117
Mechanical water, 1000 cu. m.	70322	69295	75048	80645	68999	59026	55544	51886	49454	51895	54005
Purchased water, 1000 cu. m.	90500	78804	83778	10105	87488	60936	55733	78555	64277	62833	56007
Total water losses in the system, 1000 cu. m.	**125388**	**140449**	**152466**	**161885**	**155778**	**147037**	**133866**	**128683**	**121678**	**107542**	**107648**
Water losses, %	**76%**	**83%**	**86%**	**86%**	**85%**	**85%**	**84%**	**80%**	**78%**	**75%**	**74%**
Water supply, 1000 cu. m.	**40490**	**27832**	**25591**	**27097**	**26453**	**25755**	**26109**	**31584**	**34140**	**34981**	**38081**
Population, 1000 cu. m.	34529	21508	17742	18616	18855	18083	18300	19249	20604	22389	22963
Budgetary organizations, 1000 cu. m.	2131	2174	2318	2512	2467	2442	2541	2558	2645	2681	2839
Other, 1000 cu. m.	3830	4150	5531	5970	5131	5230	5269	9777	10891	9910	12279
Water removal, 1000 cu. m.	**18966**	**15320**	**14969**	**15725**	**15399**	**15023**	**15390**	**17044**	**17562**	**19115**	**18998**
Population, 1000 cu. m.	14136	10297	9255	9689	10004	9635	10048	10855	11464	12926	12880
Budgetary organizations, 1000 cu. m.	2057	2042	2158	2291	2260	2240	2309	2254	2312	2428	2439
Other, 1000 cu. m.	2773	2981	3556	3745	3136	3148	3033	3935	3786	3762	3679

Nor Akunq CJSC

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Water entered into water supply system, 1000 cu. m.	**99 02**	**74 42**	**67 22**	**64 82**	**66 67**	**58 62**	**54 93**	**60 30**	**63 65**	**75 52**	**77 37**
Gravity water, 1000 cu. m.	0	0	0	0	0	0	0	0	0	0	0
Mechanical water, 1000 cu. m.	99 02	74 42	67 22	64 82	66 67	58 62	54 93	60 30	63 65	75 52	77 37
Purchased water, 1000 cu. m.	0	0	0	0	0	0	0	0	0	0	0
Total water losses in the system, 1000 cu. m.	**83 37**	**60 28**	**51 54**	**48 86**	**48 94**	**39 06**	**35 34**	**39 61**	**42 53**	**53 22**	**55 27**
Water losses, %	**84 %**	**81 %**	**77 %**	**75 %**	**73 %**	**67 %**	**64 %**	**66 %**	**67 %**	**70 %**	**71 %**
Water supply, 1000 cu. m.	**15 65**	**14 14**	**15 68**	**15 96**	**17 73**	**19 57**	**19 59**	**20 69**	**21 12**	**22 30**	**22 10**
Population, 1000 cu. m.	82 2	98 5	11 73	12 23	14 14	15 59	15 80	16 89	17 52	18 38	18 16
Budgetary organizations, 1000 cu. m.	22 6	25 1	25 1	26 2	26 4	29 1	28 6	28 1	27 3	28 9	31 0
Other, 1000 cu. m.	51 7	17 8	14 3	11 1	95	10 6	93	99	86	10 4	84
Water removal, 1000 cu. m.	**82 8**	**11 37**	**12 15**	**14 27**	**14 50**	**15 23**	**15 30**	**15 88**	**16 10**	**16 94**	**17 41**
Population, 1000 cu. m.	63 6	76 4	88 9	92 4	10 91	11 67	11 89	12 68	12 90	13 27	12 50
Budgetary organizations, 1000 cu. m.	62	89	10 1	95	94	12 4	13 9	15 0	14 8	15 5	28 0
Other, 1000 cu. m.	13 1	28 4	22 5	40 8	26 5	23 2	20 3	17 0	17 2	21 2	21 1

Shirak Water and Sewerage CJSC

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Water entered into water supply system, 1000 cu. m.	**52376**	**44260**	**39423**	**37360**	**32913**	**24731**	**27448**	**43119**	**46784**	**44053**	**41110**
Gravity water, 1000 cu. m.	52376	44260	39423	37360	32913	24731	27448	43119	46784	44053	41110
Mechanical water, 1000 cu. m.	0	0	0	0	0	0	0	0	0	0	0
Purchased water, 1000 cu. m.	0	0	0	0	0	0	0	0	0	0	0
Total water losses in the system, 1000 cu. m.	**44390**	**37647**	**33518**	**31756**	**27515**	**19994**	**22778**	**38408**	**42064**	**39137**	**36065**
Water losses, %	**85%**	**85%**	**85%**	**85%**	**84%**	**81%**	**83%**	**89%**	**90%**	**89%**	**88%**
Water supply, 1000 cu. m.	**7986**	**6612**	**5905**	**5604**	**5399**	**4737**	**4671**	**4711**	**4720**	**4915**	**5046**
Population, 1000 cu. m.	6731	5545	4892	4610	4268	3620	3581	3673	3652	3841	3931
Budgetary organizations, 1000 cu. m.	959	817	773	743	822	733	713	686	713	665	738
Other, 1000 cu. m.	297	251	240	251	309	384	376	351	356	409	376
Water removal, 1000 cu. m.	**5910**	**4937**	**4491**	**4332**	**4180**	**3711**	**3688**	**3768**	**3826**	**3947**	**4009**
Population, 1000 cu. m.	4937	4111	3686	3498	3327	2846	2838	2950	2961	3070	3113
Budgetary organizations, 1000 cu. m.	700	589	580	595	606	561	537	522	552	522	573
Other, 1000 cu. m.	273	237	225	239	247	304	312	296	313	355	323

Lori Water and Sewerage CJSC

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Water entered into water supply system, 1000 cu. m.	**12477**	**12673**	**12475**	**11014**	**10405**	**8045**	**6071**	**16612**	**20661**	**19548**	**15599**
Gravity water, 1000 cu. m.	12477	12673	12475	11014	10405	8045	6071	16612	20661	19548	15599
Mechanical water, 1000 cu. m.	0	0	0	0	0	0	0	0	0	0	0
Purchased water, 1000 cu. m.	0	0	0	0	0	0	0	0	0	0	0
Total water losses in the system, 1000 cu. m.	**9477**	**9487**	**9294**	**8197**	**7546**	**5485**	**3679**	**14067**	**18109**	**16785**	**12652**
Water losses, %	**76%**	**75%**	**75%**	**74%**	**73%**	**68%**	**61%**	**85%**	**88%**	**86%**	**81%**
Water supply, 1000 cu. m.	**3007**	**3186**	**3181**	**2817**	**2860**	**2560**	**2392**	**2545**	**2553**	**2763**	**2947**
Population, 1000 cu. m.	2678	2873	2862	2485	2501	2188	2066	2183	2191	2355	2545
Budgetary organizations, 1000 cu. m.	151	160	154	154	160	152	138	151	149	186	183
Other, 1000 cu. m.	178	153	165	179	199	221	188	210	213	221	219
Water removal, 1000 cu. m.	**1981**	**2313**	**2297**	**1985**	**2024**	**2134**	**2038**	**2207**	**2265**	**2437**	**2568**
Population, 1000 cu. m.	1674	2023	1996	1674	1702	1802	1740	1885	1936	2073	2228
Budgetary organizations, 1000 cu. m.	149	154	151	149	154	141	135	149	149	186	182
Other, 1000 cu. m.	158	136	149	162	168	191	163	174	180	179	158

1.2 Billing and collection of fees by water supply companies

Yerevan Djur CJSC

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total revenue of water supply and wastewater services, mln. AMD	**6663**	**8009**	**9120**	**9588**	**9527**	**10083**	**10382**	**10499**	**10657**	**10996**	**11473**
Population	4314	4973	4934	5593	5826	6180	6354	6468	6709	6765	6929
Budgetary organizations	591	800	823	812	744	762	722	713	724	725	744
Other water supplying companies	67	62	102	87	73	82	98	126	149	175	187
Other, mln. AMD	1691	2174	3261	3096	2884	3059	3208	3191	3075	3331	3614
Collection of fees, mln. AMD	**5689**	**6757**	**8403**	**9024**	**9443**	**10019**	**10493**	**10501**	**10620**	**10847**	**11154**
Population	3199	3863	4502	4978	5718	6077	6430	6437	6680	6687	6862
Budgetary organizations	677	712	863	844	774	777	733	726	723	771	730
From other water supplying companies	47	58	105	85	73	80	97	124	146	176	188
Other, mln. AMD	1766	2124	2934	3117	2879	3085	3233	3214	3071	3213	3374
Collection of fees, %	**85%**	**84%**	**92%**	**94%**	**99%**	**99%**	**101%**	**100%**	**100%**	**99%**	**97%**
Population	74%	78%	91%	89%	98%	98%	101%	100%	100%	99%	99%
Budgetary organizations	115%	89%	105%	104%	104%	102%	102%	102%	100%	106%	98%
From other water supplying companies %	70%	92%	103%	98%	100%	98%	98%	98%	98%	100%	101%
Other	104%	98%	90%	101%	100%	101%	101%	101%	100%	96%	93%

Armenian Water and Sewerage CJSC

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total revenue of water supply and wastewater services, mln. AMD	**4635**	**3509**	**3243**	**3433**	**4034**	**4183**	**4221**	**4490**	**4716**	**5064**	**5142**
Population	3899	2657	2267	2377	2963	3006	3027	3218	3425	3745	3762
Budgetary organizations	269	301	320	346	411	434	448	450	463	473	495
Other	467	551	657	711	660	744	746	822	828	845	885
Collection of fees, mln. AMD	**2451**	**2695**	**2443**	**2683**	**3388**	**3797**	**3990**	**4194**	**4438**	**4601**	**4751**
Population	1768	1854	1494	1673	2338	2628	2820	2946	3149	3317	3410
Budgetary organizations	245	301	330	340	405	434	423	446	463	477	480
Other	439	541	618	670	644	735	746	803	826	807	861
Collection of fees, %	**53 %**	**77 %**	**75 %**	**78 %**	**84 %**	**91 %**	**95 %**	**93 %**	**94 %**	**91 %**	**92 %**
Population	45 %	70 %	66 %	70 %	79 %	87 %	93 %	92 %	92 %	89 %	91 %
Budgetary organizations	91 %	100 %	103 %	98 %	99 %	100 %	94 %	99 %	100 %	101 %	97 %
Other	94 %	98 %	94 %	94 %	98 %	99 %	100 %	98 %	100 %	95 %	97 %

Nor Akunq CJSC

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total revenue of water supply and wastewater services, mln. AMD	**209**	**197**	**224**	**224**	**245**	**361**	**389**	**410**	**418**	**442**	**439**
Population	118	135	161	167	192	286	313	334	346	363	357
Budgetary organizations	29	33	33	34	35	52	55	55	53	56	62
Other	62	30	29	23	18	23	21	21	19	23	19
Collection of fees, mln. AMD	**188**	**172**	**205**	**220**	**251**	**354**	**391**	**410**	**419**	**436**	**430**
Population	105	119	145	164	193	278	324	335	346	361	348
Budgetary organizations	28	32	32	33	37	53	47	54	54	53	63
Other	55	22	28	23	21	23	20	22	19	22	20

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Collection of fees, %	**90%**	**87%**	**92%**	**98%**	**102%**	**98%**	**100%**	**100%**	**100%**	**99%**	**98%**
Population	89%	88%	90%	98%	100%	97%	103%	100%	100%	99%	97%
Budgetary organizations	97%	97%	96%	97%	107%	103%	86%	99%	102%	95%	101%
Other	88%	73%	95%	99%	114%	100%	94%	100%	98%	97%	103%

Shirak Water and Sewerage CJSC

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total revenue of water supply and wastewater services, mln. AMD	**843**	**717**	**624**	**618**	**596**	**715**	**778**	**787**	**790**	**821**	**842**
Population	709	599	512	506	472	546	598	614	611	641	656
Budgetary organizations	101	88	85	83	90	111	118	114	119	111	123
Other	33	30	28	30	34	58	62	59	60	69	63
Collection of fees, mln. AMD	**420**	**429**	**416**	**410**	**496**	**708**	**736**	**760**	**815**	**849**	**826**
Population	280	305	299	305	371	543	547	601	637	663	644
Budgetary organizations	108	93	89	77	91	109	129	104	118	117	119
Other	31	30	28	29	34	56	60	55	60	69	63
Collection of fees, %	**50%**	**60%**	**67%**	**66%**	**83%**	**99%**	**95%**	**97%**	**103%**	**103%**	**98%**
Population	40%	51%	59%	60%	79%	99%	92%	98%	104%	103%	98%
Budgetary organizations	107%	106%	105%	93%	101%	98%	109%	91%	100%	106%	97%
Other	94%	102%	100%	97%	99%	96%	97%	94%	100%	100%	99%

Lori Water and Sewerage CJSC

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015

Total revenue of water supply and wastewater services, mln. AMD	**341**	**360**	**359**	**317**	**321**	**407**	**417**	**448**	**452**	**487**	**512**
Population	301	325	321	277	279	346	359	384	387	416	446
Budgetary organizations	19	17	19	19	19	25	25	27	27	34	33
Other	21	18	20	21	23	36	33	37	37	38	33
Collection of fees, mln. AMD	**247**	**243**	**252**	**251**	**257**	**367**	**398**	**437**	**448**	**476**	**506**
Population	205	208	211	210	216	310	341	374	383	409	438
Budgetary organizations	20	17	18	19	19	24	25	27	27	31	35
Other	21	18	23	22	21	34	31	36	38	36	33
Collection of fees, %	**72%**	**67%**	**70%**	**79%**	**80%**	**90%**	**95%**	**97%**	**99%**	**98%**	**99%**
Population	68%	64%	66%	76%	77%	90%	95%	97%	99%	98%	98%
Budgetary organizations	106%	99%	98%	102%	99%	96%	101%	98%	100%	91%	105%
Other	102%	100%	116%	104%	93%	94%	94%	98%	103%	96%	100%

Annex 4. The tendering process for the new national lease contract (2015-16)

RA Government Decree N 1233-N of 15 October 2015 stated that the selection of the lessee would be organized through competitive dialogue. The same decree also defined the pre-qualification requirements for companies participating in the procurement procedure. With the support of the PPP transaction advisor, SCWE prepared the pre-qualification organization package of the tender, which the government then approved[33]. Under Article 21 of the RA ''Law on Procurement'', SCWE published the pre-qualification announcement both in the Official Journal of procurement (www.gnumner.am), as well as on the international UN Development Business (www.devbusiness.com) website on 15 December 2015. Initially, January 21, 2016 was the deadline for submission of applications (the opening day of the pre-qualification applications). However, another government decree extended the closing date and February 22, 2016 was set as the deadline for submission of pre-qualification applications in order to attract maximum potential participants in the tender process and maintain the competitive factors.

The following mandatory requirements were set for the tender participants by the pre-qualification procedure:

1) Compliance of professional activity with the contractual activity:

a. For a period of not less than 5 years during the 15-year period, the operator should have implemented either: (i) one water systems management, operation and maintenance project of no less than 5 years duration to provide water supply services to at least 600,000 people annually, or (ii) two or more water supply projects serving a combined total population of at least 800,000 (with at least one named project serving a population of more than 300,000).

b. The bidder should have water system management, operation and maintenance and project implementation experience providing services in at least three different countries during the last 15-year period.

2) Professional experience:

a. Should have performed reconstruction and rehabilitation of water systems for at least three projects each costing not less than the equivalent of US $ 5,000,000 during the last 15-year period.

b. For a period of not less than 5 years during the preceding 15-year period, the bidder should have experience with implementing one project of water system management, operation and maintenance providing service to at least 100,000 people in the territory of the RA.

3) Financial resources:

[33] RA Government Protocol Decision N 49 dated 5 November, 2015

a. Should have an average annual turnover of US$50 million equivalent in respect of its water system management, operation and maintenance over the last five years.

Following pre-qualification, SCWE announced the firms eligible to participate in the tender. In March 2016, invitations for participation in the tender package were sent out. As already mentioned above the 3 PPP contracts were to expire on 31 May, 2016. However, due to the extensive and time-consuming bidding process, under RA Government Decree N 1233-N of 15 October, 2015 the closing date for the existing PPP contracts was extended until January 1, 2017 when the new Lessee would assume its contractual obligations.

The following organizations / departments were directly involved in the tender process:

1. The RA Government, under whose decisions the bidding documents, the results of all bidding phases and the final contract were approved.
2. The State Committee of Water Economy of the RA Ministry of Agriculture as a customer, a procurement manager, a property leaser and a lease contract party (RA Government Decrees N 883-N dated 14 August, 2014 and N 1233-N dated 15 October, 2015).
3. The InterGovernmental Committee formed under RA Government Decree N 140-A dated 19 February, 2015 (the Chairman is Minister-Chief of the RA Government Staff David Harutyunyan) with which the documents regarding the tender were agreed before being circulated and before relevant decisions were adopted by the Government or the Prime Minister.
4. The RA Public Services Regulatory Commission, which must provide water systems use permits to the tender winning company, approve the drinking water tariff and its subsequent modification mechanism fixed in the lessee's contract.
5. The Ministry of Environmental Protection, which issues water use permits.

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