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Retrospective Analysis of the Urban Water Supply Sector in Senegal: A Public-Private Partnership Over Time

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FOREWORD

This study, commissioned by the AFD Innovation, Research and Knowledge department, provides a retrospective analysis of the Public-Private Partnership (PPP) that has been managing the urban water supply sub-sector in Senegal since 1995. For a number of years now, this PPP arrangement has been showing increasingly worrying signs of decline, to the point that several donors have decided to move to sovereign loans as they no longer have sufficient confidence in the ability of the public partner, the asset-holding company, to uphold its commitments. However, grounds for satisfaction remain. Senegal has achieved its access to water targets and the progress made in urban areas has been remarkable: Dakar has water supply coverage of over 98%, a figure that is around 80% in the area under PPP management. What is more, Senegal is one of only three countries in Africa where the household connection rate has grown by over 25%, behind Botswana (+52%) and ahead of Morocco (+25%), rising by + 33% between 1990 and 2015. In methodological terms, this study is based on a review of contractual documents (contracts, appendices and amendments produced since 1996), the two companies' last ten annual reports (the asset-holding company and operator), as well as gray and academic literature. The aim of this initial stage has been to identify and describe the main turning points of the original PPP. It has been followed up by interviews with key sector stakeholders in February 2017 to determine the exact nature of these turning points and explain their causes and impacts.

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Executive Summary

Background and Methodology

This study, commissioned by the AFD Innovation, Research and Knowledge department, provides a retrospective analysis of the Public-Private Partnership (PPP) that has been managing the urban water supply sub-sector in Senegal since 1995. For a number of years now, this PPP arrangement has been showing increasingly worrying signs of decline, to the point that several donors have decided to move to sovereign loans as they no longer have sufficient confidence in the ability of the public partner, the asset-holding company, to uphold its commitments.

However, grounds for satisfaction remain. Senegal has achieved its access to water targets and the progress made in urban areas has been remarkable: Dakar has water supply coverage of over 98%, a figure that is around 80% in the area under PPP management. What is more, Senegal is one of only three countries in Africa where the household connection rate has grown by over 25%, behind Botswana (+52%) and ahead of Morocco (+25%), rising by + 33% between 1990 and 2015.

In methodological terms, this study is based on a review of contractual documents (contracts, appendices and amendments produced since 1996), the two companies' last ten annual reports (the asset-holding company and operator), as well as gray and academic literature. The aim of this initial stage has been to identify and describe the main turning points of the original PPP. It has been followed up by interviews with key sector stakeholders in February 2017 to determine the exact nature of these turning points and explain their causes and impacts.

Objectives of the Reform and of the PPP

In 1995, Senegal reformed its urban water supply and sanitation sector (Law 95-10 of 7 April 1995). The reform separated the water supply sub-sector from the sanitation and rainwater sector and created three agencies to replace the previous single water agency, SOciété Nationale d'Exploitation des Eaux du Sénégal (SONEES): the SOciété Nationale des Eaux du Sénégal (SONES), a public-funded limited company that holds a concession awarded by the State to manage urban water supply assets; Sénégalaise Des Eaux (SDE), a privately-owned company that holds a lease from the State and SONES to operate urban water supply services; and Office National de l'ASsainissement (ONAS), a public-owned company in charge of wastewater management and stormwater drainage.

For the water supply sub-sector, the reform was firmly geared towards increasing efficiency: the aim was to reduce water losses by 15% after 1999 and increase the bill collection rate to 97% from 1998. The reform also sought financial autonomy for the sub-sector. In the short-term, the goal was to achieve financial viability in service operation: the leaseholder's (SDE's) revenue was to come exclusively from the bills collected from their (domestic and public administration) customers and from the standpost attendants. In the medium-term, financial viability was also to be achieved for the water supply assets: SONES was to balance its books within eight years and be in a position to finance facility development through the fee paid by the leaseholder and which the leaseholder collected from customers through the water bill.

Covering an initial period of 10 years, the affermage (lease-type) contract adopted an incentive-based, price-cap regulation approach: the operator fee, F_o, which is the portion of the average tariff retained by the operator, is fixed for the duration of the contract and not open for re-

negotiation. In addition, the leaseholder's remuneration is contingent upon his ability to achieve the target performance levels set for the two key indicators (water loss and bill recovery rates). Thus, his remuneration is reduced or increased by the difference between the target levels and actual levels of these indicators.

The PPP Turning Points

In 2002-03, the reform's objectives were achieved: the leaseholder had been generating an operating profit since 1999 and SONES was balancing its accounts and recording a positive net income due to the fee received from the leaseholder. The success of Senegal's PPP was rightly praised and credit was attributed to all stakeholders and to the quality of the financial model that correctly forecast that financial viability would be achieved, subject to an annual increase of 3% to the average tariff. However, it was also the end of the 'Golden Age of the Reform'.

A second phase (2002-2009) began with the first amendment to the affermage contract and the introduction of a tariff freeze by the State. The 2002 contract amendment shook the pillars of management at the leaseholder's own risk, the incentive framework of price-cap regulation; a shake-up that was confirmed in 2006, with the first extension of the affermage contract and the definitive switch to cost-of-service regulation. This radical change took place without the regulatory tools and practices being adapted accordingly, leading *ipso facto* to a situation in which the sub-sector was quite simply no longer being regulated. The following year, the State agreed to raise the average tariff by approving an increase in the public administration tariff only, thereby making the State the largest contributor to an asset-holding company whose position had already been weakened by the increase in consumption within the social tariff block. Meanwhile, the leaseholder, whose revenues were now guaranteed and who received a unique operator fee regardless of the volumes consumed, expanded its income streams by taking over some of the infrastructure renewal work previously assigned to SONES. SDE also accumulated rights to compensation to be asserted at the end of the contract, creating a barrier for other operators wishing to bid for the contract. At the end of this period, significant progress had nonetheless been made, in particular the subsidized connection eligibility criteria had been simplified, which has helped improve pro-poor access.

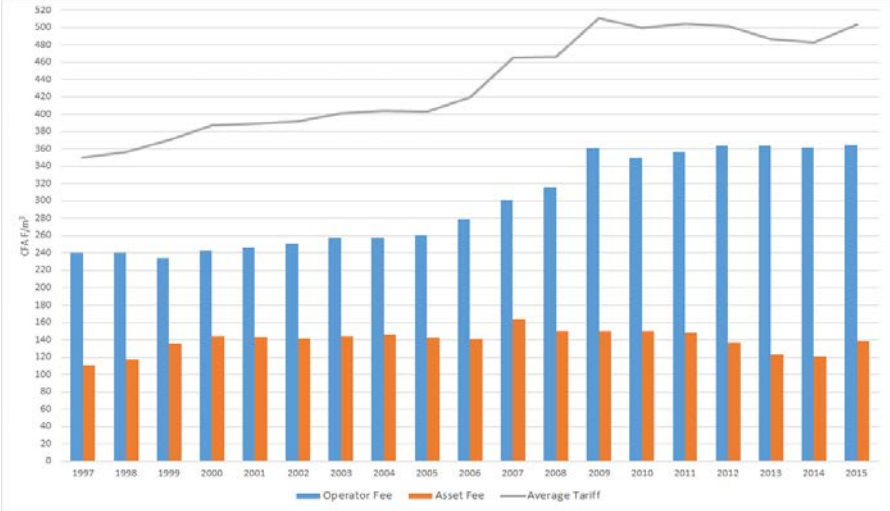
2010-2013 were the most chaotic years of the period studied. President Wade decided he wanted to overturn the vision outlined under the reform by re-consolidating the sub-sectors separated by the reform and appointing a single concession-holder to manage the entire sector. This decision was made around the time the main sector donors became majority shareholders of Eranove, an investment fund that owned 58% of SDE, following the Bouygues Group's sale of SAUR. SONES' financial situation considerably deteriorated over the course of these four years, throwing the very existence of the asset-holding company into doubt. Its net income fell by a third and its self-financing capacity dropped by 2 billion CFA Francs (17%). Work on preparing projects to replace PEPAM was put on hold as donors lacked the visibility required. In the end, the 'total concession' option was dropped and the sector was just getting ready for a fourth affermage contract extension when a burst water main left Dakar without water for 3 weeks in the autumn of 2013.

The seventh and eighth affermage contract amendments complete the transfer of responsibility for all infrastructure renewal work from SONES to SDE and require SDE to pre-finance and conduct all water production and distribution studies and new emergency work up to the end of its affermage contract in 2018. These contract amendments confirm SONES' virtual withdrawal from its renewal work planning and scheduling role and effectively add an untendered public works contract onto the affermage contract. Twelve years after the operator fee, it is now the turn of the

second component of the average tariff, the asset fee, to ‘stall’: while the operator fee has not been high enough to cover all operating expenses, including renewal, since 2002, and thus no longer provides an indication of the actual level of these costs, the asset fee now no longer offers an indication of the value of the urban water supply sub-sector assets.

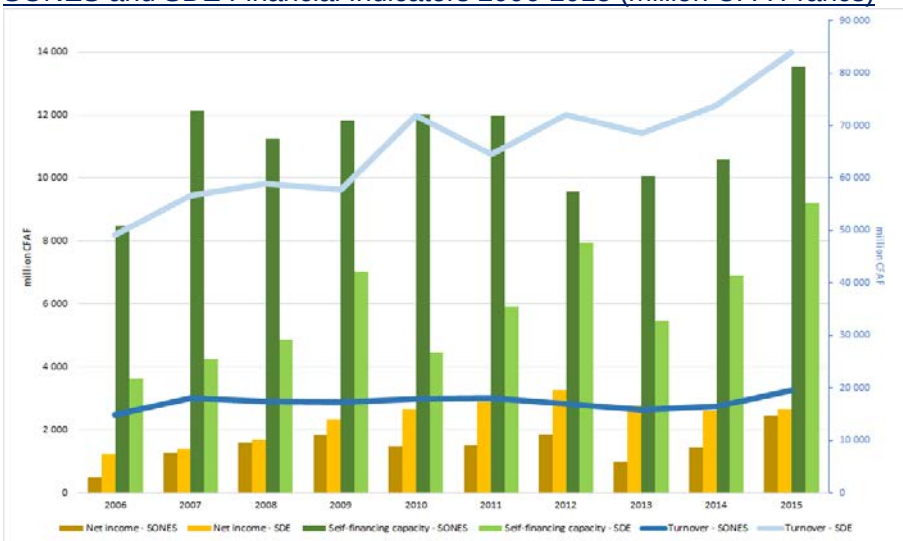
This situation reflects the difficulties SONES has encountered in attempting to fulfill its role on the basis of an asset fee that, for too long, has been used as an adjustment variable to offset the tariff freeze.

Water Supply Operator Fee, Asset fee and Average Tariff (1997 - 2015)



In 2015, SDE’s self-financing capacity stood at two-thirds the capacity of the asset-holding company, and the fee received by SONES equated to less than one-quarter of the leaseholder’s turnover.

SONES and SDE Financial Indicators 2006-2015 (million CFA Francs)



In 2015, domestic tariffs rose for the first time since 2003. This lifting of the tariff freeze, which had been promised since 2012, made it possible to re-launch the development projects (KMS 3 and the desalination plant) that had been brought to a grinding halt by the institutional shake-ups of the previous phase. These projects saw a new donor entering the sub-sector, with JICA

providing the funding to construct a desalination plant initially proposed by Eranove. Over time, this new resource could undermine one of the cornerstones of the sub-sector, namely the cross-subsidies that are applied between Dakar and Senegal's secondary cities. Desalination is expensive (having a production cost of 800 CFA Francs /m^3) and, when coupled with the work required to rehabilitate Dakar's aging network (which JICA is also interested in funding), this desalination option will increase the cost of the capital's water service and weaken an arrangement whereby part of the secondary cities' water supply costs are covered by the capital's water service revenues.

By 2017, although nobody has ever declared the First Generation Reform to be a failure, the initial objectives of financial autonomy within the sector and the virtuous inclusion of a private partner are dead in the water. The State has once more become the sector's largest creditor, the PPP has produced a highly profitable private monopoly and there is again a pressing need to review the future direction of the urban water sector. The tariff components, i.e. the operator fee and the asset fee, can no longer be used to determine the value of the urban water service; the un-depreciated value of the renewal investment has been included in the operator fee since 2002 and the extension work completed since 2014 is not covered by the asset fee, nor is the third Lac de Guiers water supply system.

Although barely sketched out in December 2016, the institutional foundations of the Second Generation Reform became centered on an option that once again involved entering into an affermage contract, this time for 15 years, with exactly the same set-up (State, SONES, and leaseholder) following an international tender process that would make it possible to start anew with a jointly agreed operator fee.

However, the conditions for encouraging effective competition do not appear to be in place: there is an information imbalance that is undeniably tipped in SDE's favor; and the rights borne out of the changes to the depreciation rules and the pre-financing of emergency work form overwhelming barriers for other potential operators. Today, the simplest way for the State to free itself of the debt it has incurred as result of the successive contract amendments would be to keep the current leaseholder in place.

Conclusion

In the spirit of the reform, separating the water assets and water service operations should have made it possible to assign transparent financial viability objectives, first for operations then for investment, with appropriate timescales (short-term for operations and medium-term for investment), by exploiting the supposedly greater effectiveness of a private manager and the supposedly more natural long-term planning approach of a public management body.

In reality, the asset-holding company's timescales have been bound by the frequency of the tariff approvals, which take place annually. Furthermore, the empowerment capacity of a public company, even when this is a limited company, is contingent on the procedures in place for appointing and removing its Chief Executive, which in this instance is through the Council of Ministers that meets every week. Private companies managing public services have long since realized that gaining control over their ecosystem is just as important as being effective when it comes to ensuring their long-term survival. Ultimately, SDE has managed what all private companies seek to achieve: it has reduced its risk and increased its profit margins by successfully lobbying for the rules initially developed to implement management at the leaseholder's own risk to be relaxed to such an extent that it has made itself indispensable, regardless of the profit it makes.

The report concludes with a series of recommendations that can be used to feed into ongoing discussions on the Second Generation Reform.

Overview of the PPP Turning Points

Affermage, contract amendment 1, 2002	SDE is profitable and SONES also generates a net profit. The sector is on the way to achieving financial autonomy. By continuing to respect the initial provisions, the State could have opted to transfer the 'water rent" to the asset-holding company, i.e. for investment, to fund extension work and improve water quality. By changing the scope of the costs included in the operator fee, the State instead *de facto* passes on the water rent to the leaseholder and, for the first time, breaks with price-cap regulation, reducing the leaseholder's risk and authorizing SDE to make a much larger profit than initially anticipated.
Affermage, contract amendment 3, 2006	The economic regulation method used switches definitively to cost-of service regulation. This signals the end of management at the leaseholder's own risk. The regulatory mechanism is not adjusted. The sector is no longer regulated. Either costs drift or the profit margin increases – in both cases out of control. In the first instance, it is the SDE staff that benefits; in the second, it is SDE's shareholders. SDE's income comes from water sales and from completing renewal work not covered by the operator fee and which is paid for by SONES.
New SDE governance, 2009	Confusion is created when the traditional sector donors become shareholders of SDE. The concession contract option begins to gain traction and throws the sector into chaos, a state of affairs that will last for the next 3 years. SONES is caught in a vice between a State that discredits it while increasing its dependence on the public administration and donors who have lost confidence in the asset-holding company, all of which indirectly benefits an unregulated SDE.
Affermage, contract amendments 7 and 8, 2014	SONES is precluded first from renewing water service assets then from extension work. Its role is reduced to transferring funds from traditional donors, funding that has been largely eroded by the fall in sub-sovereign lending. SDE positions itself as the sector's banker, but a particular type of banker as its financing terms and conditions remain unknown. Unless these 'yet-to-be-defined' conditions are more advantageous than those of concessional financing, this position would run counter to the interests of its creditors (the State and/or customers). SDE carries out extension work without having to comply with the public procurement procedures, which, unless SDE's prices are lower than its competitors, also runs counter to the interests of the State and/or its customers.

List of Abbreviations

AFD	Agence Française de Développement
CFA Franc	Franc of the Communauté Financière en Afrique
EIB	European Investment Bank
EU	European Union
MHA	Ministère de l'Hydraulique et de l'Assainissement (Ministry of Water and Sanitation)
NGO	Non-Governmental Organization
ONAS	Office National de l'Assainissement
PEPAM	Programme Eau Potable et Assainissement du Millénaire
PPP	Public-Private Partnership
SEMIS	Services de l'énergie en milieu sahélien
SDE	Sénégalaise des Eaux
SONEES	Société Nationale d'Exploitation des Eaux du Sénégal
SONES	Société Nationale des Eaux du Sénégal
WADB	West African Development Bank

General Introduction

There has been a Public-Private Partnership arrangement in Senegal's urban water supply sub-sector for the last 21 years. At the time, this PPP was both innovative and performance-focused and was much lauded by informed observers at the end of its initial implementation phase, at the beginning of the years 2000 (Brocklehurst C. et al, 2004; Trémolet S., 2005; de Gromard et al, 2010). The partners had achieved their ambitious objectives and thus acclamation and attempts to replicate the arrangement in neighboring countries and other public services in Senegal soon followed.

Fifteen years later, grounds for satisfaction remain. Senegal has achieved its access to water targets and the progress made in urban areas has been remarkable: Dakar has water supply coverage of over 98%, a figure that is around 80% in the area under PPP management. What is more, Senegal is one of only three countries in Africa where the household connection rate has grown by over 25%, behind Botswana (+52%) and ahead of Morocco (+25%), rising by + 33% between 1990 and 2015 (UNICEF, 2015).

However, for several years now, this PPP arrangement has been showing increasingly worrying signs of decline (the asset-holding company is experiencing financial difficulties, the service was interrupted for three weeks in 2013 due to lack of maintenance on a key system component, successive contract extensions are being made under sometimes chaotic conditions, etc.) to the point that several donors have decided to move to sovereign loans as they no longer have sufficient confidence in the ability of the public partner, the asset-holding company, to uphold its commitments.

The AFD Innovation, Research and Knowledge department commissioned this study to update its knowledge on PPP arrangements in general and that of the urban water supply sub-sector in Senegal in particular. Initially covering only the last few years of this PPP, the scope of the study was broadened to ultimately include the entire PPP period, from the 1995 reform, retrospectively entitled the First Generation Reform, through to the ongoing preparation of the Second Generation Reform.

The PPP arrangement was set up to supply water to Dakar and 66 secondary cities, which are partially technically connected, by piping freshwater from Lac de Guiers, a natural floodway of the Senegal River. This lake has a surface area of 240km^2 and holds 650 million m^3 of water. It provides the Senegalese capital, located over 250km away, with half of its drinking water. Although it has implemented far-reaching decentralization measures, the Government of Senegal has not devolved its water supply responsibilities to the local authorities. It is therefore a key PPP stakeholder, to the exclusion of any other public authority (Mar et al, 2008).

In methodological terms, this study is based on a review of contractual documents (contracts, appendices and amendments produced since 1996), the two companies' last ten annual reports (the asset-holding company and the operator), as well as gray and academic literature. The aim of this initial stage has been to identify and describe the main turning points of the original PPP. It has been followed up by interviews with key sector stakeholders in February 2017 to determine the exact nature of these turning points and explain their causes and impacts. As most of the stakeholders involved in designing the Reform and the PPP remain active in the sub-sector and some are now working on the Second Generation Reform, this study has helped jog their institutional memory and helped them form a clearer interpretation of the changes and irregularities the PPP has experienced over the last twenty years.

The findings of our analysis follow a chronological order. The first phase runs from the start of the reform in 1995 through to 2002, when the first amendment to the affermage contract was added that adjusted the private partner's remuneration and risk to its advantage. The second phase starts with the freezing of the average tariff in 2003 and ends in 2009 with the change to SDE governance and the Presidency's plans to radically reverse the reform by opting to merge the two sub-sectors it had previously separated (water supply, sanitation and rainwater) and place the public service under concession, thereby replacing the dual asset-holding company / operator set-up with a single company. The third, particularly chaotic, period has seen a series of short extensions being made to the affermage contract and has been marked by extremely high levels of institutional uncertainty that has hampered the planning of development projects. It ends in September 2013 when a water main (bringing water from the Lac de Guiers) burst leaving Dakar without water for 3 weeks. The last phase starts in 2014 with the most recent affermage contract extension that expands the leaseholder's monopoly to cover emergency repair work until 2018 and this under an arrangement that means that any hopes raised by the reform of a financially autonomous sub-sector have had to be put on hold.

1995-2002 – The Golden Age of the PPP

This first phase begins with the adoption of an ambitious water sector reform, coupled with an innovative contractual arrangement. The difficulties inherent in overhauling the sector were overcome through the good will of the parties involved and the outcome was positive overall, although the pro-poor policy required improvement.

I. The 1995 Sector Reform

In 1995, Senegal reformed its urban water supply and sanitation sector (Law 95-10 of 7 April 1995). The reform separated the water supply sub-sector from the sanitation and rainwater sector and created three agencies to replace the previous single water agency, SOciété Nationale d'Exploitation des Eaux du Sénégal (SONEES), which was the sector leaseholder (1971-1983) then concession-holder (1983-1995): the SOciété Nationale des Eaux du Sénégal (SONES), a public-funded limited company that manages urban water supply assets; Sénégalaise Des Eaux (SDE), a privately-owned company that manages urban water supply services; and Office National de l'ASsainissement (ONAS), a public-owned company in charge of wastewater management and rainwater drainage.

The reasons for the reform were twofold: the financial fragility of SONEES, which was highly dependent on State receivables, made it difficult to obtain the external funding required to address the shortfall in water production (100,000m^3/d) that was threatening to affect water supply in Dakar (Trémolet, 2011); furthermore, in the 1990s, donors were convinced that privatizing water service management would ultimately result in financial autonomy for the sector, a clear aim of the reform (Marin, 2009).

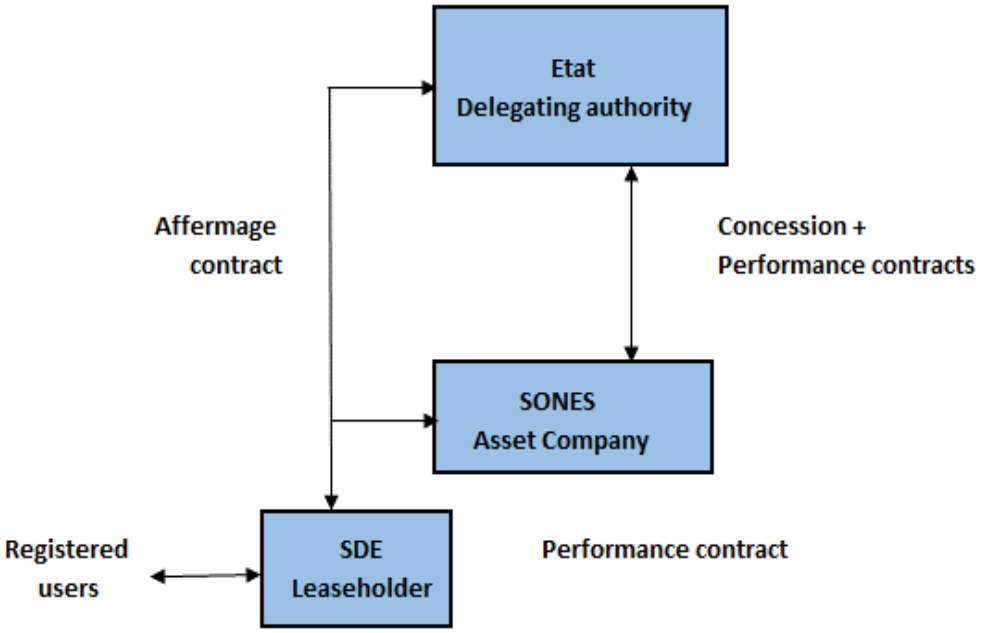
For the water supply sub-sector, the reform introduced a public service delegation arrangement to formalize the relationship between the three parties consisting of the State, SONES and SDE. The State contracted out the management and development of water service assets through a concession to SONES for a period of 30 years; the State and SONES leased out the operation of this same water service to SDE, at its own risk, under a 10-year affermage contract renewable for periods of 5 years (Figure 1).[1]

This was not the first PPP to have been used in Senegal's water sector. The Compagnie Générale des Eaux managed urban water supply services under an affermage contract between 1958 and 1971, before the sub-sector was nationalized. However, in 1996, the State was keen to ensure that the leaseholder remained partly under Senegalese ownership. Thus, companies responding to the international call for tenders had to guarantee that there would be a 'strategic partner' to provide part of SDE's capital, specifically an industrial operator with all the required technical and financial guarantees, while the remainder of the company would be owned by a combination of Senegalese investors, in this instance five

[1] A summary of the contracts and their amendments is provided in Appendix 1.

private investors (32%)[2], the State (5%) and employees (5%) (Brocklehurst, 2004). SAUR, which won the tender, holds a 58% share in SDE.[3]

Figure 1. Institutional and organizational set-up of the urban water supply sector under the reform



Source: from Nodalis – SOGREAH, 2009, p.14

II. The Reform and its Contracts

The reform was firmly geared towards improving efficiency:

- Improving efficiency in water resource use by prioritizing surface water over the depleted groundwater sources and by reducing water losses (15% from 1999 onwards, down from an estimated 27% in 1995);
- Improving efficiency in the collection of payments from (individual and standpost attendant) customers by targeting a bill recovery rate of 97% from 1998, compared to 95% in 1995.

Donors (particularly the World Bank) supported the reform by funding a special program to rehabilitate a water supply scheme (pipework and connections) on which recorded water losses were 30%, and to reduce the production deficit.

The reform also sought financial autonomy for the sub-sector. In the short-term, the goal was to achieve financial viability in service operation: the leaseholder's (SDE's) revenue was to come exclusively from the bills collected from their (domestic and public administration) customers. In the medium-term, financial viability was also to be achieved for the water supply assets: SONES was to balance its books within eight years and be in a position to

[2] Dahou and Foucher report that the privatization and economic liberalization that took place under Diouf often benefited the political elite (2004). The privatization of water service management was no exception to this. The list of the five private investors would have been drawn up at his request.

[3] Four bids were submitted, all by French companies (Compagnie Générale des Eaux, Société Lyonnaise des Eaux, CISE –a subsidiary of the Saint-Gobain Group- and SAUR –a subsidiary of the Bouygues Group).

finance facility development through the fee it received from the leaseholder and which the leasehold collects from customers through the water bill.

Thus, the reform introduced an incentive-based contract agreement that, at the time, was also highly innovative. There are two types of performance incentives in place for the leaseholder:

- The contract is based on a price-cap regulation approach, whereby the operator fee (F_o), which is the portion of the average tariff per cubic meter (T_A) retained by the operator, is fixed for the duration of the contract and not open for renegotiation (Box 1). In 1996, this was the same as the fee proposed by SAUR in their bid. Each subsequent year, the operator fee is index-linked to a set of macro-economic variables over which the leaseholder has no control (inflation, input prices), leaving him bearing all the management risk. It is not possible for the leaseholder to claim higher than forecast operating costs to request an upward revision of the operator fee. On the other hand, however, if the leaseholder succeeds in managing the services at an average cost that is lower than the cost at which his operator fee was calculated, he will make a larger profit than indicated in his business plan, without the State or SONES being able to demand a reduction to this F_o[4]. A drawback mechanism was however put in place to limit the profit the leaseholder could earn should there be a significant deviation between the forecast production volume and the volume actually produced (Box 2).
- The size of the fee that the leaseholder pays to SONES is based on achievement of his network efficiency and bill recovery performance targets, whereas his turnover is based on actual network efficiency and bill recovery. In other words, the leaseholder's remuneration is linked to his ability to achieve the target performance levels set for the two key parameters of network efficiency and bill recovery; his remuneration is reduced or increased by the difference between the target levels and the actual levels of these indicators (Box 2).

Box 1. Economic Regulation Models: Price-Cap or Cost-Of-Service Regulation

Under a traditional monopoly, economic regulation consists of encouraging competition to reduce prices (of up to marginal cost) and increase the quantities produced until demand is fully met. In a natural monopoly, there is nothing to be gained by encouraging competition (which would result in a duplication of facilities). Due to increasing returns, competition would raise the average cost, and thus prices if general bankruptcy is to be avoided. However, competitive bidding mechanisms can be used for contracts[5]. Competitive bidding for contracts is usually the preferred option for awarding affermage or concession contracts and there is a wealth of literature that addresses the limitations of these mechanisms, following on from the work of Williamson, O. (1976)[6].

Piped water supply is a natural monopoly that obeys the law of increasing returns: each additional m^3 or user costs less than the previous m^3 or user, within the limits of the capacity installed. In other words, at constant tariffs, the margin for each m^3 (or user) increases in line with the volume produced (the number of users). The role of the regulator is to limit the monopoly rent that the operator will naturally accumulate. Economic theory has shown that, without regulation, users end up with a more expensive and lower quality service (in volume or number of users) than when there is regulation in place. The regulator's scope thus covers setting the tariff and defining the service quality. The

[4] In economic terms, he has residual control rights.

[5] Demsetz, H. (1968). Why regulate utilities? Journal of Law and Economics, 11: 55–65. – and the theory of contestable markets - Baumol, W., Panzar, J., and Willig, R. (1982, 1988). Contestable Markets and the Theory of Industry Structure, revised edition, Harcourt Brace Jovanovich.

[6] Williamson, O. (1976). Franchise bidding for natural monopolies - in general and with respect to catv. Bell Journal of Economics, 7: 73–104.

combination of the tariff, targeted number of users and required service level should enable the operator to cover his costs and generate a profit, while also providing the contracting authority with a more solid base on which to plan as they know that a certain number of users are to access a defined level of service at a given tariff.

To achieve this, regulation theory has shown that there are two possible strategies: price-cap regulation and cost-of-service regulation. The advantage of price-cap regulation is that it encourages the operator to optimize his costs and expand the service, whereas cost-of-service regulation has the advantage of limiting the profit earned by the operator for each user and encouraging the operator to deliver the best possible level of service (Pezon, 1999).

The choice of whether to use price-cap or cost-of-service regulation model depends on the maturity of the sector (level of industrial and commercial risk, number of potential operators) and on the regulator's capacities. However, both models seek to reduce monopoly rent: the first by setting a price cap and the second by defining a profit per user. In practice, there is no form of absolute regulation. Under price-cap regulation, tariffs can end up being adjusted if the operator appears likely to go bankrupt and, under cost-of-service regulation, the profit rate can sometimes be revised upwards to encourage the operator to optimize his costs.

Price-cap regulation consists of defining a tariff limit that is non-renegotiable throughout the contract period. This tariff is based on the estimated costs of the required level of service. If, over the course of the contract, actual costs are found to be higher than the estimated costs and thus the tariff is insufficient, the operator is not able to renegotiate and must bear the loss. If, on the other hand, the estimated costs have been over-priced, the operator makes a profit and the regulator is unable to renegotiate either a reduction in tariffs or an increase in service levels. In other words, throughout the contract period, the tariff is not adjusted to costs. This adjustment can only be made at the end of the contract period when setting the tariff for the subsequent contract. The same is true for the required level of service: the contract stipulates the level required (water quantity and quality, accessibility, distance, etc.), as well as the number of users, and these parameters cannot be renegotiated. Under this type of regulation, the operator bears all the risk. Regardless of what happens over the course of the contract period, the objectives remain the same: the operator has a results-based obligation and risks losing the contract and going bankrupt if these results are not achieved. In return, he gets to keep the difference between the tariff income he receives and his cost expenditure. It is thus in his interests to optimize the costs by increasing the volumes produced (or number of users) and by efficiently operating his services. Price-cap regulation helps identify efficient operators, but never fully manages to dispel the regulator's and/or users' suspicions that, when they are able to overcome the risks, the operators' profits are overly high.

Price-cap regulation requires the regulator to monitor the quality of the service delivered prior to its cost. As the tariff cannot be negotiated, there is no need for the regulator to continually monitor costs to readjust the tariff during the contract period. In contrast, he must ensure that the service for which the operator is responsible is effectively delivered. It is important that, in order to maximize profit, the operator does not reduce costs to the extent that this has an adverse effect on the quality of the service delivered to users. However, the regulator cannot completely ignore the costs either. He needs reliable estimated cost information in order to draw up the public service concession contract, both to reduce monopoly rent and define a tariff that is aligned to the service level.

In theory, cost-of-service regulation is radically different. It involves adjusting the tariff in line with costs throughout the contract period to guarantee a defined service level. It is not the tariff that remains unchanged but the operator's profit per m3 (or user). The operator can be sure he will recover his costs because the tariff is 'constantly' adjusted, and he accepts a limited profit as he bears none of the risk. His profit per user or m^3 remains constant regardless of the level of his costs; thus, he has less incentive to optimize his costs than he would under price-cap regulation. Instead, he is perhaps more inclined to overspend and raise the quality of the service delivered to justify the excessive expenditure.

With this type of regulation, it is difficult to convince the regulator and/or users that there is no inefficiency on the part of the operator.

Cost-of-service regulation is much different to price-cap regulation in its implementation. The role of the regulator is less focused on ensuring the good quality of the service delivered (the operator has an interest in delivering the highest level of service possible) and more on ensuring the service is delivered at a reasonable cost. The regulator thus needs to be fully aware of all costs, and performance objectives can be set to encourage the operator to reduce these costs where necessary.

Box 2. Leaseholder Remuneration and Concession-holder Fee

SDE **Remuneration** = SDE turnover – SONES fee – ONAS fee

SDE turnover = F_o x Vol_p x E_t x μ_t

SONES **Fee** = F_a * Vol_p * E_t * μ_t

Additional Fee (drawback): if Vol_p x E_a x μ_a > estimated volume, drawback of 15% of F_o on the first 7 million m3, 35% of F_o thereafter

$T_A = F_o + F_a$

Where F_o: operator fee (236 CFA Francs/m^3 in 1996); Vol_p: volume produced; E_a: actual efficiency rate; μ_a: actual bill recovery rate; E_t: target network efficiency; μ_t: target bill recovery rate; T_A: average tariff

Indexing from 1st January 1997

$F_{o\ year\ n} = F_{o\ year\ n-1}$ (10% + 35% variation in wage index and salary expenses + 23% average cost of a KWh + 6% cost of ton of fuel + 4% price index for cast iron pipe + 22% electronic apparatus index)

$F_{a\ year\ n} = F_{a\ years\ n-1}$ (20% + 12% variation concession-holder's average wage index + 68% consumer price index)

III. Regulatory Arrangements and Instruments

There are two monitoring committees in charge of overseeing the contracts and ensuring the amicable settlement of disputes. The first committee oversees the SONES-SDE performance contract and the second oversees the State-SONES sector development contract[7] (Table 1). There are two mechanisms in place for addressing cases of unresolved disagreement: for the affermage contract, disputes are resolved by a sole arbiter in line with the International Chamber of Commerce's arbitration rules; for the concession contract, an independent expert is appointed by common agreement or by the Dakar regional court and given three months to find a solution.

Table 1. Composition of the Contract Monitoring Committees

Performance Contract Monitoring Committee (affermage)	Sector Development Contract Monitoring Committee (concession)
Representative from the Presidency Representative from the Ministry of Water and a representative from the Finance Ministry Chief Executive of SONES Chief Executive of SDE	Representative from the Presidency Representative from the Primature Representative from the Ministry of Water and a representative from the Finance Ministry DAF SONES

Source: Author, from the performance and sector development contracts

[7] The service development contract (*contrat-plan*) was redefined as a performance contract under the first concession contract amendment in 2006.

One of the key regulatory instruments is the financial model that calculates the average tariff (T_A) to be applied each year based on the operator fee (F_o), as well as an asset fee (F_a) that is sufficient to ensure that SONES can recover its (debt and operating) costs, such that $T_A = F_o + F_a$. In 1996, the scenario developed to enable SONES to achieve financial viability within 8 years included an average annual increase in the average tariff of 3%. It is the State's responsibility to validate the average tariff defined by the model each year based on recommendations produced by SONES.

IV. Results that Met the Challenges Faced

In 2002, the reform's objectives had been met and Senegal's PPP was rightly being praised. These objectives were achieved predominantly because all stakeholders played their part:

- The donors supported implementation of the reform through the 1996 - 2003 Water Sector Plan (*PSE: Plan Sectoriel Eau*) that helped improve network efficiency and increase production capacity by 20%, safeguarding Dakar from water shortages;
- After a difficult start (losses of 463 million CFA Francs in 1996 and 946 million CFA Francs in 1997), the leaseholder began to earn a profit from 1999 onwards as he successfully met the bill recovery target, substantially – yet still insufficiently – increased efficiency and increased volumes sold and customer numbers by 35%. In particular, SDE successfully used the required urban services management method by adopting a quality-based improvement approach, which involved requiring staff to follow a results-based management strategy and training them accordingly. The 16% reduction in its staff headcount enabled SDE to increase the number of customers per employee from 167 in 1996 to 267 in 2001;
- Each year, the State approved the tariff increases defined by the financial model, which were in line with expectations (3% per year) thereby validating the relevance of the key regulatory instrument;
- At the end of 8 years, SONES succeeded in generating a profit and balancing its books, as per the scenario set out in 1996.

The regulatory arrangement designed by the reform's founders proved its worth. The arbitration process set out in the performance contract to resolve disputes around initial network efficiency was successfully implemented in 1998. SDE disputed the baseline value listed in the performance contract (efficiency of 73%) claiming that, in reality, this was only 68%, which would have a significant impact on the amount SDE had to pay to SONES and thus on SDE's net earnings. The monitoring committee appointed a mediator whose proposed solution was accepted by all parties: the baseline would be changed to 68% and SDE would have an additional two years to achieve the target efficiency level of 85%. SDE was refunded the amount it had overpaid to SONES, which enabled it to report a profit of 459 million CFA Francs in 1999, a figure that remained relatively stable over the following two years (Brocklehurst C. et al, 2004).

Retrospectively, the stakeholders involved in implementing the reform highlight the positive momentum that drove this initial phase. The managers of both SONES and SDE knew each other after having worked together at SONEES: they were cut from the same mold, had designed the reform arrangements together and felt invested in its success. This was a key factor in sustaining the 'palaver tree' and in reaching consensus, as was the stakeholder continuity that remained in place until 2002 (Trémolet, 2011).

V. A Pro-Poor Strategy that Needs to be Improved

One of the shortcomings of this 'Golden Age for Water' concerns the measures included for providing access to the poorest households. Four measures were developed to improve pro-poor access to water: the installation of subsidized 'social' connections, an increasing block tariff, cross-subsidies between Dakar and secondary cities and the construction of public standposts.

To promote pro-poor take-up of subsidized connections, the PPP stipulated that a single operator fee be applied to all volumes consumed, despite the subsidized tariff for the social tariff block being lower than the operator fee. The PPP also stipulated that the amount SDE was to bill SONES for installing a subsidized connection was to be the same as the sum invoiced for installing an ordinary connection. It is therefore just as worthwhile for SDE to meet the needs of a customer eligible for a subsidized connection and whose consumption falls within the social tariff block as it is to deliver services to an ordinary large consumer. Should there be a fall in the average price of a m^3, this directly impacts the fee received by SONES but does not affect the leaseholder's remuneration (Blanc, 2006). However, the problem lies with the subsidized connection eligibility criteria as a household must:

- Not be well-off;
- Hold the title deeds to their house;
- Be able to have a connection installed without this crossing private land;
- Live less than 20 meters away from the main water pipe;
- Pay a deposit of 13,000 CFA Francs as an advance on consumption.

Brocklehurst highlights that many poor households struggle to meet these criteria and that they are difficult to implement, particularly the first criterion on the list.

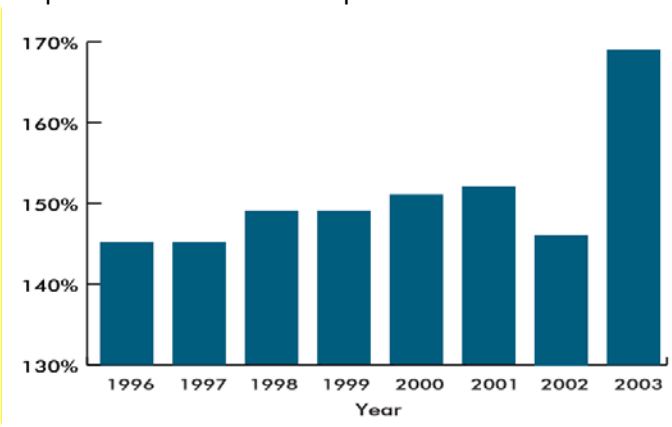
The block tariff system means households pay the subsidized, social tariff for water consumption of $40m^3$ within a two-month period. However, this type of tariff structure benefits all households regardless of their relative financial status, including those that are not poor.

The application of the same tariffs in Dakar and secondary cities is a highly redistributive arrangement. It benefits well-off households in the secondary cities and is supported by both well-off and poor households in Dakar. However, in 2005, it was estimated that 19% of all households in Dakar were poor (Diagne, 2005).

The use of standposts is the most controversial of the four measures. Brocklehurst notes that "The increase in the standpost tariff has been higher than any other category over the seven years of the reform (35%), and has systematically been higher than the social tariff" (Brocklehurst, 2004, p.40) (Graphic 1).

In addition, the tariffs that standpost attendants charge their customers are not regulated and can be between 6 and 8 times higher than the social tariff applied to piped water service customers. "*Reducing the cost of water at the standpost would appear to be a priority for ensuring equitable access to water for the poorest population groups"* (Blanc, 2006, p.21).

Graphic 1. Tariff at the standpost in % of the social tariff from 1996 to 2003



Source: Brocklehurst, 2004, p.41

2002-2010 – The Reform is Turned Upside Down

This second phase starts in 2002 with the first amendment to the affermage contract, which revisited the price-cap regulation principle and thus operations management at the leaseholder's risk. This initial shake-up was confirmed in 2006, when the affermage contract was extended for the first time, with the definitive switch to cost-of service regulation. In addition, the State ceased to comply with the requirements set out in the financial model by deciding to freeze all tariffs, followed by domestic tariffs only, in effect becoming SONES' largest creditor with SONES' position already having been weakened by the increase in consumption within the social tariff block.

I. First Contract Amendment and First Shake-Up of the Reform

In 2002, SDE successfully appealed for a reduction in the scope of the costs to be recovered through the operator fee (F_o). Since 1996, the contract required SDE to renew 6,000 connections and 17km of network each year at its own expense. SDE was to depreciate these assets over the lifetime of the contract (through a financial depreciation charge) rather than over the assets' technical life (straight-line depreciation). As of 1st January 2002, the leaseholder has been authorized to apply straight-line depreciation to connections and the network (20 years for connections and 30 to 50 years for the network) at a constant operator fee. At the end of the contract, the un-depreciated value of this renewal investment will be refunded to SDE by the subsequent operator.

In legal terms, this amendment reclassifies the annual 6,000 connections and 17km of network as *biens de reprise* (a specific French term meaning 'assets for recovery of possession'). This means that they are assets that belong to SDE and, as such, SDE has the right to be refunded the residual book value of these assets at the end of the contract; this is the same right that is applied to the meters.

In the short-term, this amendment subverted the price-cap regulation mechanism. SDE's justification for changing the depreciation rules was the 25 million m^3 (nearly 68,000m^3/d) difference between the volume of water sold in 2001 and the estimated volume; a difference that resulted in lost revenue, which SDE demanded be taken into account. In theory, a gap between the leaseholder's estimated and actual figures is not legitimate grounds for demanding a tariff adjustment. In this particular case, strictly speaking, the operator fee was not altered; however, it was *de facto*, and this has sustainably increased SDE's margins.

This amendment would turn out to have profound longer-term implications. In effect, it gives SDE the right to compensation through a payment equal to the un-depreciated value of SDE's renewal investment. This right will have a knock-on effect for SDE's successor, thus deterring firms from submitting bids when the contract is next put out to tender.

Retrospectively, this first amendment appears to have been an initial demonstration of force between the two companies, with the leaseholder being the company to prevail. SONES was clearly opposed to the proposal that SDE submitted to the monitoring committee. In theory,

any prejudicial gap between estimated and actual volumes should have been addressed by negotiating a contract extension, all other factors being equal. However, not only was SDE in no financial difficulty (it generated a profit of 496 million CFA Francs in 2001), but it also had both compensations met: the depreciation rules were changed in 2002, and were signed by the Minister of Mines, Energy and Water, ex-officio member of the committee; and, in 2006, its contract was extended for 5 years, and was signed by the Prime Minister, new ex-officio member of the performance contract monitoring committee.[8]

This first amendment also coincided with the end of a period of great stability within the SONES general directorate. El Hadji Dieng, who took over as Chief Executive of SONES from Babacar Dieng (1996 - 2001), was let go after 11 months just after the second contract amendment was signed. Each of his successors only remained in post for between 4 months and 2 years, resulting in 6 different Chief Executives in 9 years until the current Chief Executive, Charles Fall, was appointed in October 2014.

II. Change in the Regulation Method: from Management Risk to Management with Guaranteed Income

In 2006, the third contract amendment[9] broke permanently with the initial method of regulation that had already been shaken up by the contract amendment of 2002. Price-cap regulation was abandoned in favor of cost-of-service regulation. This radical switch took place without the regulatory tools and practices being adapted accordingly, leading *ipso facto* to a situation in which the sub-sector was quite simply no longer being regulated.

Now, the operator fee increases each year regardless (baseline F_o). The baseline F_o is also indexed. This indexing incorporates increases in SDE staff-related expenses and is adjusted in line with variations in the price of electricity (Box 3). In other words, SDE operates on the assumption that the baseline operator fee will continually rise and that any increase in its main expenditure items (staff and energy) will trigger an increase in the baseline F_o. As a result of this "double indexing" (Diassy, 2016), the operator fee rose by over 25% in 5 years (Table 2). Meanwhile, the network efficiency and bill recovery indicators defined in 1996 remained unchanged.

Box 3. New Operator Fee (F_o) Indexing Formula

$F_{o\ year\ n}$ = baseline $F_{o\ year\ n-1}$ (10% + 25% variation of average SDE salaries (capped at 3% per year) + 9% variation of the consumer price index + 28% average cost of a KWh + 10% French pipe construction index (*Moniteur des Travaux Publics*) + 8% electrical equipment index (*Moniteur des Travaux Publics*) + 6% organic chemicals price index (*Moniteur des Travaux Publics*) + 4% change in fuel price).

The F_o and indexing formula can be revised *notably* when there are variations in the price of electricity.

The drawback mechanism is abolished.

[8] Since 2006, the affermage contract monitoring committee has included the Primature, following the example of the concession contract monitoring committee.

[9] Contract Amendment 2 of 1st September 2003 contained a minor modification to the area under affermage, see Appendix 1.

This change to the economic method used for regulation was made with no accompanying modification of the SDE to SONES reporting arrangements, or of SONES' monitoring of SDE, despite the strict monitoring of the leaseholder's costs and verification of his margins being two of the fundamental controls required under such a set-up (see Box 1).

Table 2. Baseline F_o and Indexed F_o from 2007 to 2011

	2007	2008	2009	2010	2011
Baseline F_o	284.1	293.3	298.5	299.4	301.9
Indexed F_o	301.4	316.3	361	349.4	356.4

Source: SONES reports

In order to successfully monitor the contract, it was necessary to overhaul the financial model that, since 1996, had ignored the operator's accounts and determined the average breakeven tariff based on the contractual operator fee and SONES' debts and operating expenses. The model needed to be changed in order to check that SDE's actual expenditure matches estimated expenditure and adjust the operator fee accordingly. This would involve accessing the leaseholder's cost accounting records, accurately entering all leaseholder expenditure, followed by SONES' debt and operating expenses, to determine the average breakeven tariff.

Although the financial model underwent a profound transformation in 2008, this remained insufficient for the following three reasons:

- The skills required to administer the model and monitor the operator under cost-of-service regulation are very different to the skills required under price-cap regulation; however, skillsets within SONES and the Ministry of Water have not been upgraded. Thus, SONES continues to conduct the same type of monitoring as before, outsources audits to audit firms (2008, 2012 and 2016) and notes *a posteriori* that certain types of expenses recognized in the operator fee should not have been included (Table 3).

Table 3 Cost Price of Water before and after the Identification of Period Costs

	2008	2009	2010	2011
Full operating cost of water BEFORE identification of wrongly incorporated costs	314.98	314.98	314.98	314.98
Full operating cost of water AFTER identification of wrongly incorporated costs	284.21	284.21	284.21	284.21
Variation (CFA Francs)	**30.77**	**30.77**	**30.77**	**30.77**

Source: Audit report on SDE's cost accounting, 2012

In this respect, SONES is no different from other public or parastatal companies whose management culture consists of highly bureaucratic procedural and financial controls ("regulation by procedures", Bampoky, 2012). There is very little management control and neither economic constraints nor efficiency and effectiveness aspects are fully taken into account. Like these companies, SONES' has staff that is highly qualified, but not necessarily skilled in management or cost calculation.

- SDE blocks the transfer of information, arguing that the terms of its contract do not oblige it to provide the information requested. The obligation to maintain updated cost accounting records has been included in its contract since 1996; however, contract amendment 3 failed to increase the scope of the information SDE is required to transfer to SONES.
- Even if SONES had been able to accurately monitor SDE costs, had any gap between actual and estimated costs been identified that required a downward revision of the operator fee, this revision would have had to be implemented through a contract amendment: the baseline operator fee and the indexing formula are contractual, therefore they can only be changed through an amendment. Worse still, the drawback mechanism has now been abolished: the profits generated by SDE are no longer limited should the volumes produced far exceed the estimated volumes.

Contract amendment 3 thus marks the end of management at the leaseholder's own risk: SDE is guaranteed to recover all of its costs and earn a profit, the size of which is not only unknown but is also no longer limited by a provision in the contract. This contract amendment rejects all economies of scale in operations or, more accurately, passes all earnings onto the leaseholder: the more the sector develops, the more the leaseholder earns.

Contract amendment 3 also enables SDE to expand its construction work-related responsibilities without taking on any risk. The amendment gives SDE the authority to carry out renewal work in SONES' place if SONES fails to meet its new network renewal obligations. However, SONES' obligations have been ramped up to levels that have never been reached, not even during the special rehabilitation program (43km a year compared to 100km in 5 years over the 1996-2001 period). SONES knows that these obligations were unachievable and has made this clear to the State. Thus, SDE will be carrying out this work, at SONES' expense, in line with the tariffs listed in the unit price schedule appended to its performance contract.

> *"We didn't have 43km of network renewals to do at the beginning. And we told the State that it wasn't possible, that we wouldn't be able to complete it, that we don't have the financial resources to do it, but it was approved and it's just given SDE new sticks to beat us with!" (Representative from SONES).*

SDE is thus successfully diversifying its income streams (remuneration through the operator fee and revenue from work not covered by the operator fee) and, on a political level, is disenfranchising SONES in its role as asset-holding company.

III. The Advantages and Disadvantages of Financial Viability

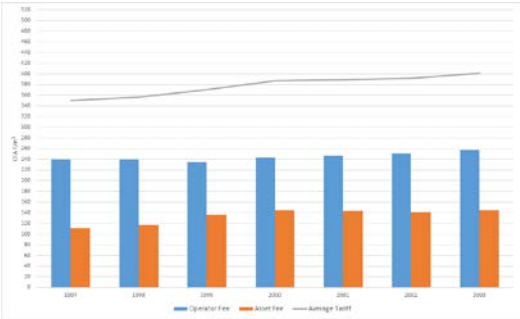
The reform notably sought to ensure that the sector achieved financial autonomy. SONES was to have balanced its books within 8 years, then finance sector development using the fee revenue collected from water service customers.

In 2003, SONES no longer needed a line of credit to cover its operating costs and managed to generate a net income of 384 million CFA Francs. However, since 1996, SONES had also been accumulating losses of 9.8 billion CFA Francs, which it needed to clear in order to improve both its balance sheet and its creditworthiness.

SONES' ability to generate a profit means a key step in the process of building an autonomous sub-sector has been reached. It has been achieved through the significant increase in the asset fee (F_a) since 1996, an increase that has occurred alongside an increase in the average tariff (T_A) that has been limited to 3% per year, as anticipated by the financial model (Graphic 2).

However, continued efforts are required: at a constant asset fee, SONES will hopefully be able to renew the current assets; however, it cannot both finance the renewal of these assets and finance network extensions to ensure full urban coverage at the same time. It should be possible to guarantee investment for expanding the network by increasing the fee, an increase that keeps pace with the rise in the volume of water produced and the rise in asset fee. To successfully manage increases in the average tariff, in theory, it will be necessary to utilize economies of scale in service operations and progressively reduce the operator fee. Virtuous economic regulation needs to guarantee that the water income generated as a result of the increase in water production and distribution efficiency first and foremost benefits the users of the service (see Box 1).

Graphic 2. F_o, F_a and T_A from 1997 to 2003



Source: author, based on SONES annual reports

However, the State has taken a different view: as SONES has achieved financial viability, the State considers that there is no need for any further increase in the average tariff.[10]

> *"Financial viability means that SONES has made a profit and achieved a positive cash flow. When this viability was achieved, the government decided that there was no further need to adjust the tariffs; even though nowhere in the text did it stipulate that this would be a consequence of achieving financial viability. The term sector financial viability has never been properly defined." (Representative from SONES).*

Tariffs were frozen from 2003 onwards and it would take SONES 10 years to once again reduce its carry-over (retained earnings account) and this through an increase in production volumes only. The average tariff did not change and the operator fee was indexed. The asset fee, for which indexing had become *de facto* inapplicable, fell on a constant franc basis and, in 2006, dropped back to its 2002 level in current francs (141 F/m^3); meanwhile, there was an 11% increase in the operator fee over the same period. The situation worsened in 2006 as a

[10] It is to be noted that water supply is not an isolated case. In 2001, the President decided to reduce the price of rice, oil and telephone communications to make good on the electoral promises made prior to his election in 2000 (Diop M.C., 2000). Dahou and Foucher also report that, although A. Diouf was forced to forgo creating public service jobs in the 1990s, in 2003, A. Wade was able to announce the recruitment of 15,000 people over three years, increase public servant salaries and benefits and reduce income tax (2004).

result of the contract extension. The dually indexed operator fee rose inexorably, leading to an automatic and continual drop in the asset fee, which had become an adjustment variable; the asset fee fell by 8.5% between 2007 and 2010.

Under pressure from donors, the State finally agreed to increase the average tariff, but at the cost of dismantling the pricing structure, which created more problems for SONES by making it heavily reliant on the public administration paying its bills. This is because the State decided to increase the average tariff by increasing the public administration tariff only. This tariff increased by 62% on 1st September 2008, then by 56% at the beginning of 2009, the year it reached 1,800 F/m^3 excluding taxes, tripling the size of the State's water bill and profoundly increasing the amount of its receivables (23.7 billion compared to less than 8.8 billion CFA Francs in 2006).

This situation upset SONES' financial viability as the fee it received was based on the volumes *billed* to domestic customers and the bills *collected* from the public administration by SDE[11]. The public administration bills now make up half of the fee received by SONES, yet these bills can be paid up to two years late. SONES' cash flow has suffered to such an extent that it can no longer meet the financial obligations for which it was created (Table 4).

Table 4. Debt Coverage Ratio – SONES 2006-2011

	2006	2007	2008	2009	2010	2011
Debt service coverage ratio	0.75	1.03	0.76	1.2	1.83	0.45

Source: SONES annual reports

IV. SONES' Lost Battles

SONES realized that the tariff freeze was going to jeopardize its financial viability. It sought to redefine the scope of its obligations to preserve its capacity to finance extension work on the water supply assets.

In 2004, SONES' auditor published his findings: the State had unduly passed 15.8 billion CFA Francs of depreciation onto SONES, without which, ever since its creation, it would have been returning a surplus with a consolidated profit of 9.4 billion CFA Francs, instead of once more having a carry-over of the same amount. SONES demanded repayment of this sum. Essentially, the company requested that a distinction be made between the assets assigned to it under the concession contract and the assets that it had funded itself since 1996. SONES also contested having to amortize – and thus renew – the assets it had inherited from SONEES. These assets belong to the State and thus it is the State that should be responsible for their renewal, with SONES responsible for renewing only those assets installed since 1996.

At first glance, this request is confusing as, by right, all water supply assets have been delegated to SONES, which also inherited all SONEES liabilities. As far as we can see, this dispute was an attempt to neutralize the negative impacts of the tariff freeze on the fee received by SONES. This request was reiterated in all of the concession-holding firm's

[11] Provision of the affermage contract, see Appendix 1.

annual reports between 2004 and 2010 and appears to have been used to put pressure on the State to restore SONES' financial viability. However, this is a dispute that will never be settled. The request does not appear in the 2011 annual report, which is the year the separation of the two public bodies culminated in a tax adjustment for the national company of 1.5 billion CFA Francs.

Over the course of this period, SONES' annual reports also provide an insight into the efforts made to improve staff working conditions and benefits: the – aborted – negotiations to arrange home loans and construct housing; the recruitment of category C staff (drivers and secretaries); an increase in payroll that exceeded the rise in staff headcount (+ 25% compared to 18% between 2006 and 2011); and an increase in training expenditure criticized by the Finance Director in 2013.

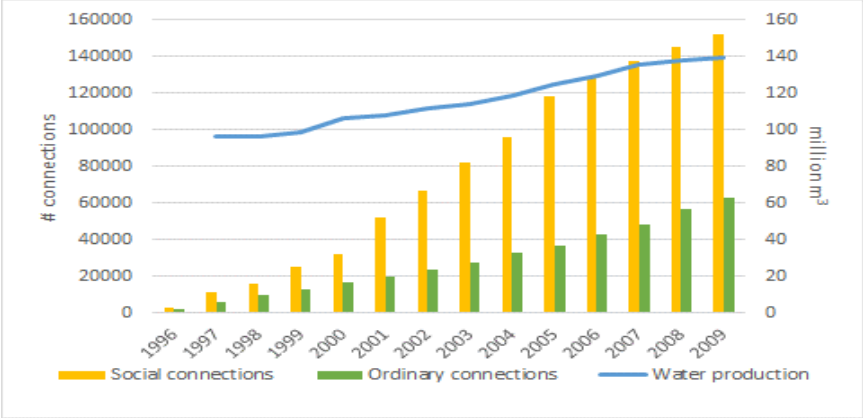
These factual elements could be considered comparable to the management situation often found in poorly regulated public monopolies that tend to create organizational slack. In such a public monopoly, the service-related income earned is spent on their staff rather than being allocated to the service's users whereas, in a poorly regulated private monopoly, this same income is used to provide stronger returns for its shareholders. In this case, it would appear to us that SONES has requested these changes in order to seek compensation for the fact that they have been unable to influence the decisions made. The asset-holding company feels unsupported by its supervisory ministry (its contacts within the Ministry of Water and Sanitation have been transferred to the rural water supply sub-sector and there have been numerous changes to the ministry's scope) and ignored by politicians. The monitoring committees are no longer holding meetings, leaving SONES and SDE to deal with each other directly, with SDE not hesitating to bypass SONES and submit its demands directly to the policymakers, if necessary.

V. Paradoxical Outcomes

At the end of this period, significant progress had been made. At the same time, the first shortcomings of the reform process had also become clear and the stakeholders appeared to start focusing on preparing the Second Generation Reform to redress them.

The positive developments included the phasing and scale of the investment projects (PSE in 1996-2003, PLT in 2003-2007 then PEPAM from 2005 onwards), which helped increase water production by 40% to 140 million m^3 per year, expand the water access and connections work initially planned for the capital only to other urban and peri-urban areas within the affermage contract area, and considerably develop access to piped water at home through subsidized connections (Graphic 3).

Graphic 3. Production Capacity and Connections between 1996 and 2009



Source: author, based on SONES annual reports

The process of targeting the poorest households for subsidized connections was also substantially improved. First of all, the eligibility criteria were relaxed: anybody with a letter of recommendation from the head of their district could submit a request for a subsidized connection and SONES allowed households to group together to ensure that the length of the connection to be installed per user did not exceed 20 meters (Diagne, 2008). Under the PEPAM, the criteria were definitively simplified still further and now consist of a single geographic criterion: only the inhabitants of the central districts of Dakar are not eligible for subsidized connections. This measure should help improve the situation for the poor, including those living in Dakar where, according to a survey conducted in 2005, fewer than half of poor households have a connection.[12]

The situation for standpost users has not improved, however. They consume two-and-a-half times less water than households with piped water at home yet, on average, pay three times more (Table 5).

At the end of 2009, the stakeholders were preparing to overhaul the reform by developing what has become known as the Second Generation Reform, which was due to be implemented at the end of the affermage contract extension period in 2011. The institutional changes required are defined in Law SPEPA 2008-59 of 24 September 2008 that endorses the expansion of public service delegation contracts to all water services, both urban and rural. Clear efforts were made to improve contract regulation and the law includes the creation of an inter-ministerial committee to monitor the delegation contracts.

Table 5. Water Tariff, excluding Connections

Water provision	Water Tariff including tax (CFA F/m3)
Standpost	Official tariff: 322.31 Real tariff: 973 (25 F per 30L container)
Wells	641
Neighbour's connection	1566
At home by carter	4583 750 F per 200L container
At home by carrier	3104

Source: Diop, 2014, adapted from Diagne (2011) and Briand et al. (2009)

[12] Survey on water distribution in Dakar conducted in 2005 by the Consortium pour la Recherche Economique et Sociale (CRES), Diagne, 2008.

Studies were launched to assess the reform since its implementation in 1996, update the financial model, estimate future water demand and define the second phase of PEPAM.[13] However, this process came to an abrupt halt in December 2009, when the Presidency of Senegal brought about a radical change of course within the sector by introducing 'total concession'.[14]

[13] The EIB financed a water price study, the World Bank funded a study on water demand and Nodalis was appointed to conduct an assessment of the reform and lay the foundations for once again putting the affermage contract out to international tender.

[14] Thiam (2007) indicates that this order is consistent with President Wade's methods: "today in Senegal, the rule of law is not a robust standard but an instrument now in the hands of the head of state, who uses it to address his tactical concerns (…) Power is concentrated in the hands of an authoritative, even autocratic President, whose undeniable intellectual qualities lend themselves to neither modesty nor power-sharing". [Unofficial translation from the original French text].

2010-2013 The Reform Hits Stormy Seas

2010-2013 were the most chaotic years of the period studied on all fronts:

- Organizationally, with a radical change in SDE's shareholders, as the strategic partnership was replaced by a donor-governed investment fund;
- Institutionally, through a radical shift in the reform that resulted in the three companies created in 1996 being replaced by a single concession-holder for water supply, sanitation and rainwater services;
- Contractually, with the signature of 3 contract amendments in 3 years, extending the affermage contract first until December 2012 (amendments 4 and 5[15]) then until December 2013 (amendment 6);
- Technically, with water services in Dakar being interrupted for 3 weeks in September 2013.

I. New SDE Governance

Since 1996, SDE's majority shareholder had been SAUR, a subsidiary of the Bouygues Group, which held 58% of SDE's shares. In 2007, Bouygues sold SAUR but retained the rights over all contracts being implemented outside France, which it grouped together under a management fund called Finagestion, a subsidiary that it owned virtually outright (holding over 99% of the shares). In November 2009, Bouygues sold 67% of Finagestion to the capital investment fund Emerging Capital Partners (ECP). It initially retained 33% of its Finagestion shares, which was renamed Eranove, before ultimately selling these to Axa, a French insurance group.

Today, fewer than 19% of Eranove's shares are held by Axa; however, nearly 56% are held by ECP Africa Fund II, of which the AFD Group is a shareholder through its subsidiary Proparco, alongside other donors, such as the World Bank, the EIB, the WADB and AfDB (Transparency International, 2011).

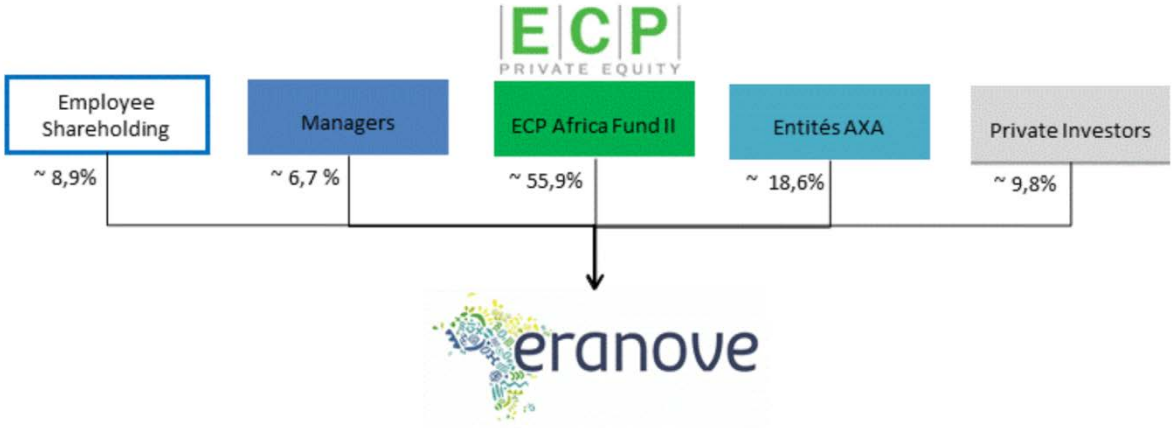
President Wade's decision not to renew the affermage contract and switch to 'total concession' was made around the time the main sector donors became the SDE's major shareholders (Figure 2).

Transparency International was quick to highlight that this decision placed the donors in a conflict of interest situation with the State of Senegal (TI, 2011). Are the donor-shareholders more interested in ensuring the sector is regulated or in ensuring that SDE retains the water revenue? As the State is the ultimate guarantor of the loans issued to SONES, do they not win on both counts by financing SONES investment and by collecting the dividends from SDE, which distributes all of its profits each year; profits that exceeded 2 billion CFA Francs in 2009?

It is not unreasonable to think that the Senegalese President felt that, as the donors were also SDE shareholders, they could directly finance sub-sector investment without going through SONES, and that the affermage contract should consequently be succeeded by a concession contract. Under this set-up, SONES becomes superfluous to requirements.

[15] These two contract amendments are identical. They were duplicated after the first amendment was rendered invalid due to problems with its form.

Figure 2. Eranove Shareholders, Holder of a 58% Share in SDE



In 2010, the State tasked SDE with conducting a study to "define the principles of a 30-year concession contract covering water supply, sanitation and rainwater management services in Dakar and inland cities that would enter into force on 1st January 2013" while, at the same time, wanting "to increase SDE's responsibility by involving it in funding, managing and realizing investment".[16]

On the eve of the presidential elections, the study concluded that it would be necessary to increase water tariffs by more than 30% if services were placed under concession. The new President, Macky Sall, chose not to adopt this contractual option. Contract amendment 6 extended the affermage arrangement by a further year, this time with a view to negotiating a new 5-year affermage contract extension from January 2013 "if all conditions are met".

II. Dakar Deprived of Water

It appeared that all conditions had been met, despite the breakdown of a main water pipe that left Dakar without water for 3 weeks in September 2013 and "a breakdown in communication between the various sector stakeholders (State, asset-holding company, private company) that created a breeding ground for water riots" (Diop, 2014). The compensation strategies put in place (free water bills, water distributed by tankers, etc.) did nothing to assuage the anger of Dakar's residents. This led Diop to ask: "Have the institutional architecture and water services' financial model not reached their limit?"

SDE was never formally held responsible for this 2013 incident. Not only was it never sanctioned for the prolonged service interruption (other than through its lost revenue), but it was also awarded a 5-year contract extension just a few weeks later.

However, this significant breakdown came at the end of a six-year period during which "the erratic operation of Dakar's water distribution system had become the rule rather than exception in a large number of districts" (Diop, 2014). Diop goes on to cite the water shortages experienced in July 2008 (14 days), June 2010 (10 days), May-June 2011 (12 days) and April 2012 (8 days) that preceded the three-week service interruption in September 2013. Although, according to SDE, 99% of water samples tested in

[16] Contract amendment 4.

Dakar meet drinking water standards, consumers in Senegal criticize the fact they are expected to drink rust-colored water, which is due to the high iron content of the groundwater in certain areas. Distrust of the water supply is multifaceted and is notably illustrated by the booming bottled water market (Valentin, 2010).

III. The Rescue of SONES

For SONES, the situation considerably deteriorated over the course of these 4 years. Its net income fell by a third and its self-financing capacity dropped by 2 billion CFA Francs (17%).

This ultimately jeopardized the financial viability of Senegal's entire urban water supply sector.

In 2013, the fee received by SONES was around the same as it received in 2006. Not only did the asset fee suffer from the 'natural' increase in the operator fee when the average tariff was once again frozen, but SONES was also hurt by the success of the social connection policy and the increase in consumption within the first tariff block (0 to 20m^3 every two months) (Table 6).

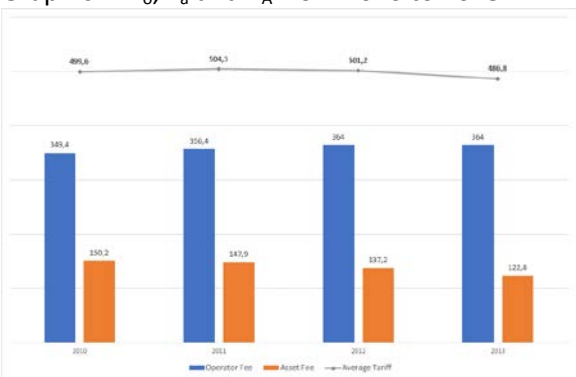
Table 6. Structure of Consumption by Block in 2008 and 2014[17]

Billed Volume	2008		2014	
	# bills	%	# bills	%
0 m3	12 207	2	78 534	7
1 - 10 m3	67 553	9	127 006	11
10 - 20 m3	165 800	23	283 962	24
20 -30 m3	176 116	25	284 440	24
30 - 40 m3	116 000	16	179 856	15
40 - 50 m3	67 921	9	98 747	8
51 - 100 m3	88 922	12	116 561	10
> 100 m3	21 662	3	24 264	2
Total	**716 141**	**100**	**1 193 370**	**100**

Source: Artelia, 2016, p.297

The asset fee (F_a) fell by nearly 20% in 4 years, dropping back to its 1998/99 level in 2013 (Graphic 4).

Graphic 4. F_o, F_a and T_A from 2010 to 2013



[17] Overall, the average two-monthly bill was for 34m³ in 2008 compared to 30m³ in 2014. The recorded fall in consumption is not due to a general reduction in consumption among all customers, but to the addition of new customers: consumption levels increase significantly the longer a customer uses the service.

Source: author, based on SONES annual reports

Work on preparing the projects to replace PEPAM was put on hold. New investment was required to meet water demand, but the donors lacked visibility and were waiting for the situation to be clarified. As a compromise, and in total disregard of the objective to reduce dependence on this type of resource, SDE was authorized to withdraw more groundwater in an attempt to maintain stability in the sector, as extracting groundwater is less costly than transporting water from Lac de Guiers (Diop, 2014).

In 2012, the donors put their foot down and demanded that the State take action not only to reverse the accumulation of unpaid bills that was putting SONES' solvency under threat, but also to revise the pricing structure that had seen the State replace domestic users as the main contributor for covering the sector's operating costs. The pricing schedule was finally revised in 2015, bringing 12 years of domestic tariff freezes to an end. However, the pricing schedule was not fully restructured: although the domestic tariffs were increased (the social block by 4% and the intermediate blocks - 20 to 100m^3 in a two-month period - and dissuasive block - over 100m3 in a two-month period - by 9%), the public administration tariff remained at its already very high level.

2014-2017 - The PPP is Dead, Long Live the PPP!

This final phase covers the latest 5-year affermage contract extension, which has put a final nail in the coffin of a reform that has been struggling since 2002, and the preparation of the Second Generation Reform.

I. The Leaseholder-Banker

Affermage contract amendment 7, which came into effect on 1st January 2014, confirms the full handover of responsibility for renewal work to SDE by assigning all network and connection renewals to the leaseholder. SDE is now solely in charge of renewing the 60km of network each year, a responsibility that was shared under the previous contract amendment in which SDE was to renew 17km of network and SONES 43km. SDE is now also solely responsible for renewing all 12,000 connections each year, rather than just half.[18]

This contract amendment also includes a feeble attempt to manage the baseline operator fee, which, for the first time since 1996, is to be revised downwards over the course of the final two years of the contract (from 366.5 CFA Francs/ m^3 in 2016 to 363.8 CFA Francs/ m^3 in 2018). In addition to the fact that, before indexing, it will be higher in 2018 than in 2014 (362 F/m^3), the operator fee will continue to cover the cost of investment in infrastructure renewal in proportion to its straight-line depreciation, i.e. at best, a sixth of the value of the renewed network and a quarter of the value of the connections. Furthermore, the transfer of all renewal work to the leaseholder gives SDE a considerable advantage over other firms interested in bidding for the next contract in 2018. The MHA estimates that the 2002 change to the depreciation rules will end up costing between 10 and 12 billion CFA Francs by the end of the contract.

With contract amendment 8 that was signed in October 2014, the leaseholder is responsible for conducting all water production and distribution studies and new emergency work up to the end of the affermage contract in 2018[19]. This contract amendment confirms SONES' withdrawal from its renewal work planning and scheduling role and effectively adds an untendered public works contract onto the affermage contract.

The excessively slow new public procurement procedure (2012) has been extremely damaging. The special dispensation granted to public companies to expedite public procurement was repealed to increase transparency and the procedure now takes between 180 and 190 days to complete. Awarding a construction work monopoly to the leaseholder helps save time.

SDE has to pre-finance the new construction work over which it holds the monopoly, needing to put up an estimated 5.4 billion CFA Francs, which the State will owe to SDE at the end of the contract. Twelve years after the operator fee, it is now the turn of the asset fee to 'stall': while the operator fee has not been high enough to cover all operating expenses, including

[18] In addition, contract amendment 7 increases the number of meters to be renewed to 20,000 a year (compared to 12,000 up to 2006 and 16,000 thereafter).
[19] I.e. all work excluding that for the KMS 3 and desalination plant.

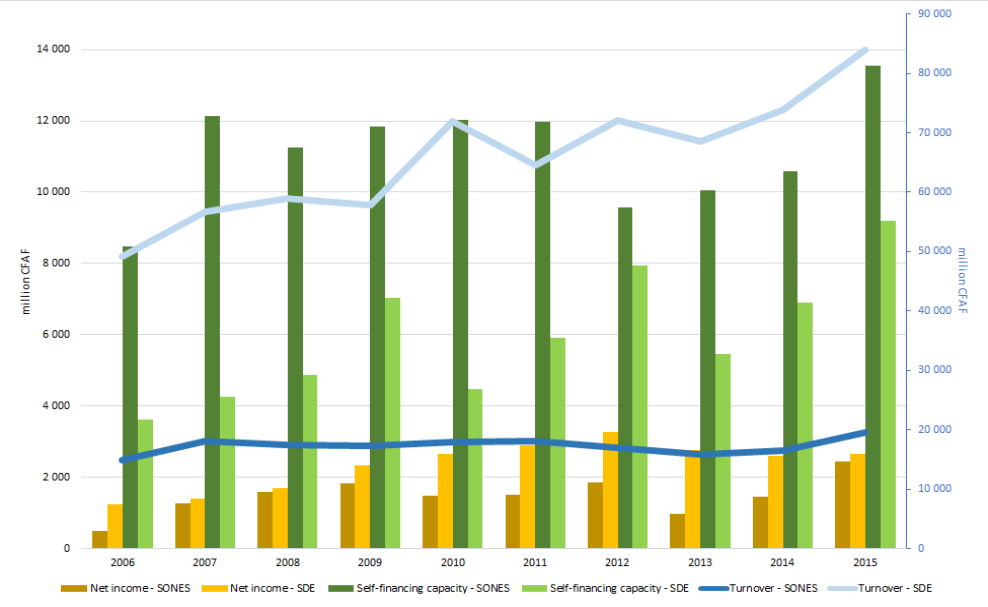
renewal, since 2002 and thus no longer provides an indication of the actual level of these costs, the asset fee now no longer offers an indication of the value of the urban water supply sub-sector assets.

This unprecedented situation reflects the difficulties SONES has encountered in attempting to fulfill its role on the basis of an asset fee that, for too long, has been used as an adjustment variable to offset the tariff freeze.

The scale of the drift observed is clearly illustrated by the fact that, in 2015, SDE's self-financing capacity stood at two-thirds the capacity of the asset-holding company; in addition, the fee received by SONES equated to less than a quarter of the leaseholder's turnover (Graphic 5).

Would the State have successfully managed to get the leaseholder to use its own funds to finance sub-sector investment? If yes, the terms and conditions are significantly different from those that would have applied under a concession contract, in which SDE would have had to have taken the risk of recouping its investment through the tariff levied on its customers. This is currently neither a concession nor a concession-based affermage contract, as the leaseholder's investment in new infrastructure falls under an agreement that the State will honor under terms that "are yet to be defined".

Graphic 5. SONES and SDE Financial Indicators 2006-2015 (million CFA Francs)



Source: author, based on SONES and SDE annual reports

II. The Lifting of the Domestic Tariff Freeze and the Re-Launch of Development Projects

In 2015, domestic tariffs rose for the first time since 2003. As the public administration tariff remained very high, an extremely large portion of the fee received by SONES continued to come from the bill paid by the State.

This lifting of the tariff freeze, which had been promised since 2012, made it possible to re-launch the development projects that had been brought to a grinding halt by the institutional shake-ups of the previous phase. Planning work for the third Lac de Guiers to Dakar water supply system (KMS 3) was finally able to start. Donors, including AFD, had taken note of SONES' fragile state; thus, rather than directly funding the asset-holding company as had been the case for previous programs, they switched to using sovereign loans. The asset fee had 'stalled' to such an extent that the State transferred only 15% of this funding to the asset-holding company.

> *"For the last round of financing, through sovereign loans, the State only transferred 15% of the 274 billion to SONES because a total handover would have upset SONES' financial stability". (Representative from the MHA)*

Not only is there an issue with the average tariff, which is recognized as no longer reflecting total operating costs and investment costs, but the entire pricing schedule is problematic: the public administration tariff makes the State the largest contributor to the sector and the domestic tariffs face the same obstacles usually encountered with increasing block tariff systems (Komives, 2006).

All customers, both rich and poor, benefit from the social tariff block. As the average size of households (12.7) is higher than the figure used to calculate the increase in access per connection (8.5), an average-sized household needs to restrict its consumption to 26 l/c/d in order to benefit fully from the social tariff. However, the poorest households consume an average of 28 l/c/d (Artelia, 2016[20]). Only one-third of the poorest households falls entirely within the social tariff block. While the average household bill increases in line with household wealth (from 10,800 CFA Francs every two months to 18,750 CFA Francs every two months), the affordability ratio (% of the households' budget spent on the water bill) is somewhat higher for poor households (3%) and has been increasing overall since 2008. The pricing system used at the standposts has not improved, despite having been censured as being unsatisfactory for the last 20 years: in 2015, households using standposts were paying between 900 CFA Francs (in Nguekhokh) and 2,500 CFA Francs per m^3 (in Parcelles Assainies).[21]

The second development project involves the construction of a desalination plant to satisfy Dakar's water needs. Proposed by Eranove, SDE's major shareholder, the project was finally approved by the State after funding was provided by JICA, which was just entering the sub-sector.[22] There is unanimous local opposition to this project: nobody apart from SDE is convinced that it help secure water supply for Dakar. Over time, this supplementary supply could, however, undermine one of the cornerstones of the sub-sector, which is based on cross-subsidies being applied between Dakar and Senegal's secondary cities to support

[20] The Artelia study reviews the pro-poor access to water policy through a survey conducted with 1,500 households divided into wealth quintiles. Carried out in 2015, it covered 1,000 registered piped water customer households and 540 non-registered customer households (using standposts) in 7 cities within Senegal: Dakar, Matam, Kaolack, Nguekhokh, Ziguinchor, Sédhiou and Kolda. To segment the households by wealth, the survey used a composite index that reflected the household's monetary and material wealth: information on the household's monetary wealth was obtained from its budget and its material wealth was assessed through observation of the household's possessions. The population surveyed was then divided into quintiles.

[21] In addition, the proportion of non-registered customer households wanting to become piped water customers has continued to rise, reaching 90% in 2015 (Artelia, 2016)

[22] JICA had previously only worked in the sanitation sub-sector.

these smaller cities. Desalination is expensive (having a production cost of 800 CFA Francs/m^3). When coupled with the work required to rehabilitate Dakar's aging network (which JICA is also interested in funding), desalination will increase the cost of the capital's water service and weaken an arrangement whereby part of the secondary cities' water supply costs is covered by the capital's water service revenues.

> *"People are concerned about the desalination project. It is being funded by the Japanese and people are wondering whether this means that the French are going to withdraw. And how will the PPP and the system put in place to manage this plant co-exist?" (Representative of an NGO)*

III. The Struggling Second Generation Reform

Work on the Second Generation Reform began in 2015 with a tariff study and water demand assessment carried out by Artelia. This was then followed by the development of a water supply master plan for Dakar and Petite Côte (Cabinet Merlin). At the same time, the SEMIS/IDEV consortium was appointed to undertake institutional assessments. The tone of the first report in these series of assessments was scathing, reflecting an atmosphere in which stakeholders seem to be wavering between score-settling and preparing for the future.[23]

Although nobody has ever declared the reform to be a failure, the initial objectives of financial autonomy within the sector and the virtuous inclusion of a private partner are dead in the water. The State has once more become the sector's largest creditor, the PPP has produced a highly profitable private monopoly and there is again a pressing need to review the future direction of the sector.

The barely sketched out institutional foundations of the Second Generation Reform became centered on an option that once again involved entering into an affermage contract, this time for 15 years, with exactly the same set-up (State, SONES, and leaseholder) following an international tender process that would make it possible to start anew with a jointly agreed operator fee.

> *"There are doubts over the justification of the operator fee and the only way to determine if it has been overestimated is by issuing an international call for tenders." (Representative of a consultancy firm)*

However, the conditions for encouraging effective competition do not appear to be in place: there is an information imbalance that is undeniably tipped in SDE's favor; and the rights borne out of the changes to the depreciation rules and the pre-financing of emergency work form overwhelming barriers for other operators wishing to bid for the contract.

In addition, the tariff study and water demand assessment revealed that much still needs to be done to deliver a good quality service that fully satisfies its users, whether these be connected to the piped system (registered customers) or get their water from standposts (non-registered customers) (Artelia, 2016). Fewer than 55% of registered customers are satisfied with the service delivered by SDE. Their main complaint is service interruptions

[23] Babacar Dieng, former Chief Executive of SONES (1996-2001), was the author of the first report.

(40.5%), with only 31% of households considering that water is continually available all year round. Customers are also dissatisfied with the water quality, whether its color (26%), its taste or its smell (both at 11.7%). The principle improvements required by piped water service customers are better water quality (44.5%), fewer service interruptions (30.5%) and greater water pressure (12.1%). These findings also hold true for non-registered customers: half are satisfied with the service continuity, 51% would like to see the improvements in the water quality and 22% would like water to be continuously available.

Investing in improving the water quality will not help bring about short-term improvements in either the access rate or turnover; consequently, such investment is not a priority. However, in our opinion, serious consideration needs to be given to making this investment, both for reasons of public health and for improving service sustainability. The demand assessment reports that the lack of pressure and frequent cutoffs mean 75% of registered customers store their water. However, 68.3% of these customers do not treat this water before drinking, even after having stored it for more than 24 hours; and this figure rises to 80% among the poorest households. Furthermore, households would be prepared to pay 2.5% more than they are currently billed in return for improved service quality (continuity, quality and pressure). As the affordability ratio for both registered and non-registered customers is increasing (standing at 3% and 3.5% respectively in 2015, compared to 1.9 and 1.5% in 2008), it is possible that customers may ultimately object to any tariff rise if they do not receive a better-quality service in exchange.

Conclusion and Recommendations

By creating companies that were legally separate from the State, the reform hoped to restrict political interference in urban water supply sub-sector management. However, this detachment was not enough to take the politics out of the tariff variable, no more than the reform was able to do away with a mechanism under which tariffs are approved by the public authorities.

The State of Senegal supported the reform for eight years. However, it has been undermining the reform since 2003, first by freezing all tariffs (2003-2007), then domestic tariffs only up to 2015. Consequently, the pricing system is now doubly flawed:

- The level of the public administration tariff means that the State plays a major role in covering the urban water service's operating costs, making the sector independence sought by the reform highly relative;
- The tariff components, i.e. the operator fee and asset fee, can no longer be used to determine the value of the urban water service; the un-depreciated value of renewal investment has not been included in the operator fee since 2002 and the extension work completed since 2014 is not covered by the asset fee, nor is the third Lac de Guiers water supply system.

Today, the simplest way for the State to free itself of the debt it has incurred as a result of the successive contract amendments would be to keep the current leaseholder, SDE, in place.

In the spirit of the reform, separating the water assets and water service operations should have made it possible to assign transparent financial viability objectives, first for operations then for investment, with appropriate timescales (short-term for operations and medium-term for investment), by exploiting the supposedly greater effectiveness of a private manager and the supposedly more natural long-term planning approach of a public management body.

In reality, the asset-holding company's timescales have been bound by the frequency of the tariff approvals that take place annually. Furthermore, the empowerment capacity of a public company, even a limited company, is contingent on the procedures in place for appointing and removing its Chief Executive, which in this instance is through the Council of Ministers that meets every week. Private companies managing public services long since realized that gaining control over their ecosystem is just as important as being effective when it comes to ensuring their long-term survival. Companies operating within a competitive environment seek to develop a business segment in which they can create a monopoly. Companies with a monopoly endeavor to hold onto it by tilting the rules in their favor. Ultimately, SDE has managed what all private companies seek to achieve: it has reduced its risk and increased its profit margins by successfully lobbying for the rules initially developed to implement management at the leaseholder's own risk to be relaxed to such an extent that it has made itself indispensable, regardless of the profit it makes. The situation in which SDE currently finds itself is similar to that of private operators in France in the 1980s: concession contracts made a remarkable comeback and, under a weak cost-of-service regulation system, provided the operators with guaranteed coverage of unaudited costs and a level of remuneration usually associated with major risk-taking. In Senegal, the creation of an asset-holding company responsible for conducting audits has done nothing to prevent the same thing happening.

In conclusion, we have produced a number of recommendations to feed into discussions on the Second Generation Reform:

- Put the affermage contract out to tender once more through an international call for tenders

It is not possible to determine a baseline operator fee from the tariff study conducted in 2015. The tariff study focuses on application of the latest contract amendment and thus does not include a review (or justification) of the current operator fee. Unless SDE provides unrestricted access to their accounts, the only way of defining a fully legitimate operator fee is through a call for tenders.

- Re-introduce the financial depreciation charge

The international call for tenders must clarify responsibilities for infrastructure work (renewal and extensions) and require that the work financed by the operator be incorporated in the proposed bid price and depreciated over the duration of the contract. Any work that is not to be financed by the operator or depreciated over the contract period will be put out to tender in line with the public procurement procedure. In other words, if competitors are prepared to invest, they need to be ready to do so at their own risk, i.e. with due regard for the principles of the PPP. If they carry out work financed by others or consider it impossible to depreciate the work over the remaining life of the contract, they must comply with the public procurement procedure.

- Introduce bipartite contracts

If the affermage contract option is selected, we would recommend doing away with the State/SONES/leaseholder tripartite contract arrangement, under which SONES has never been able to stake out its place, and introducing bipartite contracts instead. This would mean setting up a concession contract between the State and the asset-holding company, then an affermage contract between the asset-holding company (delegated contracting authority) and the operator, followed by a service contract between the operator and service users.

If the option selected is the concession contract, there will no longer be any need for an asset-holding company. The contract can be agreed between the State and the concession holder, with SONES becoming a regulatory body in charge of monitoring the concession contract.

- Restore price-cap regulation

Putting a contract out to tender provides an opportunity to start afresh with a fixed tariff and to restore price-cap regulation, which is better aligned to sector competencies, the quest for performance and incentives for the private water service manager.

- Revise the pricing structure

A revision of the pricing schedule is required. The geographic-based eligibility criteria for subsidized connections could serve as a base: a lower tariff will be applied in areas where people are eligible for subsidized connections. In order to adopt such an approach, a more

refined definition of the eligible geographic areas for both the social tariff and subsidized connections will be required. In addition, zoning rules will need to be strictly applied as it would appear that these have sometimes been bypassed during the subsidized connections approval process.

- Regulatory bodies

The stakeholders met in Dakar were divided over the required format and devolved authority of a regulator for the urban water service. Proposals ranged from a lean structure to a proper agency with coercive power. The Ministry of Water noted that the regulatory agencies established for the energy and telecommunications sectors are ineffective as the opinions of the energy regulatory body are ignored and the operating procedures of the telecommunications regulatory agency are extremely cumbersome.

There are several factors that need to be taken into account:

- The monitoring committees place great emphasis on political arbitration and support the introduction of regulatory scope into the regulation process, i.e. politically motivated changes in the rules, rather than an interpretation of the contracts based on technical or societal events;
- In the event of disagreement over the affermage contract, the arbitration process includes settlement through a sole arbiter in line with the International Chamber for Commerce's arbitration rules; however, for the concession contract, dispute resolution is through an independent expert appointed by common agreement or by the Dakar regional court. The option of using an expert appointed by common agreement worked well during the first PPP phase and would perhaps have been useful for settling the disputes that arose around the leaseholder's performance contract. Introducing this option of using an expert or group of experts that have been jointly appointed by all parties would help breathe fresh air into an arrangement under which SONES has repeatedly found itself locked in a losing battle;
- The financial model, a key regulatory tool, has been frequently misused since 2006, to the point where each of the parties has been able to modify it, including its investment inventory component, which will no doubt complicate end-of-contract accounting. In order to safeguard the model and decisions taken, a permanent secretariat could be put in place, either housed in the Ministry of Water or within the inter-ministerial committee created by the 2008 law. The role of this permanent secretariat would include being the repository not only for the sole and unique 'prevailing version' of the model, but also for all correspondence between the stakeholders and for the committees' meeting minutes.

- Enable customers to buy into the capital of the new operator

Fundamentally, the main thing that would change with a new operator is the private partner's shareholding structure[24]. SDE is considered to be a local company, despite 58% of its shares ever being under foreign-ownership. The fact that 32% of its capital belongs to Senegalese investors has helped to shape this perception.

At the same time, the demand assessments conducted in 2008 and 2015 reveal that users have little knowledge of even the most basic aspects of their water service, such as the

[24] All SDE staff should be taken on by the company awarded the contract.

subsidized connection eligibility criteria, the cost of a connection (subsidized or not) or the existence of a social tariff block.[25]

Subject to compliance with national and sub-regional regulations, one possible option could include expanding the Senegalese shareholder base. The same proportion of capital (32%; lower than the blocking minority threshold) could be passed down to the operator's customers, with one non-transferable share option issued to each of its 666,000 customers (one share per customer registration policy). This arrangement would reinforce Senegalese ownership of the operator and would also internalize user expectations and the measuring of their satisfaction with the service delivered into the company's decision-making processes, even if the incumbent operator is reappointed.

[25] In 2015, 23% of households with a connection knew about the social tariff block. In order to manage water demand, awareness of this information is vital as 73% of customers familiar with the social tariff block have adopted more cautious behavior, a figure that rises to 84% among the poorest households. In addition, 14% of households stated they were aware of the connection cost (19.6% of the wealthiest households compared to 11.8% of the poorest).

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Appendix

Appendix 1. Summary of Contracts and Amendments since 1996

Date	Legal Status	Provisions
9 January 1996	10 year affermage contract State/SONES – SDE, renewable for 5 year periods	SDE Responsible for the maintenance, extension and renewal of water supply assets throughout the contract area Permanent, continuous and regular operation of the public service, of good quality and good pressure (1 bar) water production and distribution Must prioritize the use of surface water for water supply Must connect all property owners and all tenants with title deeds requesting a connection Can monitor all work for which it is not responsible Takes on all SONEES staff not transferred to SONES or ONAS Penalty applied for partial service interruptions, insufficient pressure, failure to produce contractual documents Meters: SDE owns the meters, and is refunded the residual book value at the end of the affermage contract Connections: installed at the customers' expense based on unit prices appended to the contract (subsidized connections are installed at SONES expense – see the service regulation set on 23 December 1998) Standposts: installed upon request from local authorities and at their expense; SDE fits them with meters paid for by the local authority; the cost of water is calculated by volume and billed to the local authorities Staff training program Work - Maintenance: everything, including meters and connections - Extensions: meters, connections; work based on appended unit prices - Renewal: 14,000 meters, 6,000 connections, 17km of pipe per year, electromechanical equipment with a life of < 10 years or a unit value of < 15 M CFA Francs; all these renewals are included in the operator fee (F_o) Estimates the public authorities' annual consumption and forwards this to SONES in October for budgeting purposes. Remuneration = turnover – fee to SONES and ONAS Remuneration is intended to cover water production and distribution operations and maintenance, SDE-managed network renewal and overheads Public authority invoices are transferred once they are paid In the event of non-payment, the leaseholder can cut off the water supply 48hrs after notification, including public authorities Indexed F_o; indexing can be renegotiated after 5 years Reporting - Annual staff training program progress report - Annual maintenance program - Annual renewal program - Network plans after 3 years, updated annually - Annual management report - Implementation of a new cost accounting system in 1998 to determine the water supply production cost and distribution cost - Monthly communiqué on volumes withdrawn, distributed, billed, collected for the different tariff blocks and tariffs - Balance sheet and income statement - Renewal account and connection account reports - Operating account; management report; technical report containing volumes (produced, sold, collected), number of customers (individuals, companies, public authorities, crop-growers), collection ratio, water quality testing results - Inventories of leased assets and own assets - Technical and financial reports every 5 years Unit price schedule - Applies to all work over which the leaseholder holds a monopoly (provision * 1.533) - Indexed unit prices SONES - Undertakes to make infrastructure available - Undertakes to implement investment programs - Undertakes to fulfill its obligations to monitor the affermage contract - Incorporates all work completed by the leaseholder into its assets (except meters) at the value listed on the unit price schedule State

		- If SONES fails to meet its work-related obligations, the State can give the leaseholder notice to complete the work at SONES expense - The opposite also applies, but at SONES expense - If the leaseholder fails to conduct proper maintenance, the work in question can be carried out within 96 hours at the leaseholder's expense Dispute resolution: amicable settlement, otherwise final settlement in line with the International Chamber for Commerce's arbitration rules by a sole arbiter; applicable law: Senegalese law and the rules of international law Performance contract of the same length as the affermage contract, revised every 2 years (18 IP in Appendix A) SONES - Extension and renewal investment program in a program agreement - To determine baseline values (collection, performance) within two months; otherwise, an international expert will be appointed to develop an evaluation methodology and define the baseline value within a maximum of 3 months - Rehabilitation: special rehabilitation program covering 100km of network and 30,000 standposts to be completed within the first 5 years of the contract at SONES expense - Renewal fund to be set up by SONES to cover the cost of its renewal work SDE - Maintains a record of the number of leaks - Sets threshold groundwater pumping value - Sets precise collection and performance targets - Ensures 96% of samples meet WHO standards - Sets out specific timeframes for repairing leaks, installing a connection once request has been approved, etc. - Sets precise criteria for network renewal (no. of leaks, equipment, age, etc.) - Must conduct a willingness-to-pay study with a representative sample of potential customers prior to submitting all extension project proposals to SONES - Carries out the special rehabilitation program; start date no later than 8 months after funding received from the Emergent Senegal Plan (PSE: *Plan* Sénégal *Emergent*) - Undertakes to propose a 3-year rolling investment program that is submitted to SONES prior to being translated into a program agreement Monitoring committee: representative of the Presidency, representative from each of the two supervisory ministries, Chief Executive of SONES and Chief Executive of SDE - Quarterly meeting, as a minimum - Settles disputes between parties by seeking consensus Dispute resolution: same process as for the *affermage* contract Nothing on the traditional restrictions imposed in the event that the leaseholder modifies or partially or entirely transfers his capital.
26 April 1996	30 year State – SONES concession Renewable for 10 year periods Appendices to the contract	SONES Responsible for managing the water supply assets throughout the contract area Work (public procurement code) - Extensions: within its funding capacities and subject to the network extension work being completed directly by the leaseholder in agreement with SONES and to ensure service continuity - Renewal: all production, supply and distribution assets apart from renewal to be funded by the leaseholder - Rehabilitation: implementation of a special rehabilitation program (1996-2001) covering 100km of network and 20,000 connections - Electromechanical equipment of an initial value of > 15 M CFA Francs (1996) or > 10 years Developing a 10-year urban water supply master plan and a 10-year investment plan including detailed planning for the following year Monitoring operations: producing monthly and annual operator monitoring reports Informing users of payment and good water use Remuneration (own funds): fee paid by SDE $(T_A – F_o) * Vol_p * E_t * \mu_t$ where T_A: average tariff; F_o: operator fee = 236 CFA Francs/m^3; Vol_p : volume produced ; E_t: efficiency of the target network; μ_t: target bill recovery Additional remuneration (drawback) if volume billed > than estimated volume: 15% of F_o on the first 7 million m3, 35% of F_o thereafter Indexing of F_o from 1997 : $F_{o\ year\ n} = F_{o\ year\ n-1}$ (10% + 35% variation in wage index and salary expenses + 23% average cost of a KWh + 6% cost of ton of fuel + 4% price index for cast iron pipe + 22% electronic apparatus index) $F_a = T_A – F_o$ where F_a: asset fee Indexing of P_a from 1997 where $F_{a\ year\ n} = F_{a\ year\ n-1}$ (20% + 12% variation in concession-holder's average wage index + 68% consumer price index) Funding Own funds: operating costs, operator monitoring, renewal work and debt servicing

		External funds: extensions Reporting: annually (financial statement and operating account, operational cost accounting to be set up by December 2016, management report, updated asset inventory, investment plan, public relations program report (customer-focused activities) and every 5 years (technical and financial reports) Sanctions imposed for work delays or late submission of reports to the licensing authority State - Respects the principles of financial viability for the urban water supply sub-sector and economic efficiency and transparency: sets annual water tariff increases and indexing, revises the pricing schedule and reduces public authorities' consumption - Pays the public authorities' water bills - Assists SONES with fundraising - Conducts technical monitoring: annual, optional and at its own expense 4-member monitoring committee (representative from the Presidency, representative from the prime minister's office (the Primature), a representative from each supervisory ministry (MHA, MEF), DAF SONES) that assesses the SONES and State commitments through a sector development contract to be renewed every 3 years throughout the concession period Sector development contract (*Contrat-Plan*): SONES - Implements a 3-year rolling investment program (investment program agreement) with the leaseholder - Submits this agreement to the State each year - Submits a tariff modification request at the end of September to the two supervisory ministries for implementation on the 1st January of the following year - Produces an operator monitoring report each year State - Can subsidize pro-poor investment - Undertakes to annually increase tariffs to break even by 31/12/2003 (SONES has a zero or positive cash balance). The % increase is determined by the financial model - Reports on activities undertaken to reduce public authorities' water consumption each year - Undertakes to pay the public authorities' water bills within 4 months - Validates the investment program on an annual basis Dispute resolution: amicable settlement procedure led by the monitoring committee; then, appointment by common agreement of an arbiter within 30 days, or arbiter appointed by the Dakar regional court; process must be completed within 3 months
28 January 2002 applicable from 1st January 2002	Amendment no.1 to the affermage contract (signatories include the Minister of Mines, Energy and Water, Macky Sall)	Reasons: - Gap of 25 million m3 compared to forecast sales at the end of 2001 - Maintain the sector's financial credibility without impacting tariffs Solution: amend the investment depreciation rules for the network and connection renewal work completed by the leaseholder from 1st January 2002 onwards 1996-2001: depreciation over the remaining life of the contract (financial depreciation charge) Since: depreciation over the actual lifetime of the equipment (straight-line depreciation) Impact: - Reduced annual depreciation expenses - At the end of the affermage contract, these investments are acquired at their residual book value by the subsequent operator
1st Sept 2003, applicable from the same day	Amendment no. 2 to the affermage contract	Reason: a program and World Vision carried out extension and improvement work in a rural area that fell under the affermage contract scope and which was previously supplied with water through the central commune's network (Bambey commune) Solution: - Remove this area from the affermage contract scope. It contains a water supply scheme and 97 connections belonging to SONES and 97 meters belonging to SDE. - State to refund the residual value of the meters
28 March 2006, applicable from 23 April 2006	Amendment no. 3 to the affermage contract (signatories include the Prime Minister, Macky Sall)	"Urban water supply management is now one of the most successful on the continent" In 2003, the authorities begin discussing what is to happen after 2006 – in-depth assessment and conclusions: - Extend the affermage contract by 5 years - Introduce performance indicators to be met by SONES and SDE - Share funding for renewal between these two companies SDE - Obligation to distribute water that meets WHO standards, subject to exemptions granted. - Responsibility of the leaseholder contingent on rehabilitation by SONES and renewal by the leaseholder of damaged pipework located in the water table Renewal: - 16,000 meters and 6,000 connections each year - Electromechanical equipment with a life of < 10 years or a value of < 17 million CFA Francs 2005

		- In the event of a dispute over paying for renewal, "the leaseholder can, in agreement with SONES, renew equipment at SONES expense. In this case, compensation will be claimed on the sum owed to SONES under conditions consistent with SONES cash position". - All (63 to 300mm) pipe and connection renewal work (and studies) are awarded exclusively to the leaseholder, in compliance with the public procurement procedure. Funds for the work financed by SONES will be paid to the leaseholder in accordance with the price schedule - SDE determines the location of all pipe and connection renewal work, including the work financed by SONES Remuneration - F_o of 279.2 CFA Francs/m3 in 2006 to 301.9 CFA Francs/m3 in 2011 (before indexing) - New indexing formula: $F_{o\ year\ n} = F_{o\ year\ n-1}$ (10% + 25% variation of average sector salaries (ultimately only SDE, capped at 3% per year) + 9% variation of the consumer price index + 28% average cost of a KWh + 10% French pipe construction index (*Moniteur des Travaux Publics*) 8% electrical equipment price index in France (*Moniteur des Travaux Publics*) + 4% change in fuel price) - Fo and indexing can be revised, notably following variations in the price of electricity - Abolition of the drawback mechanism Unit price schedule - New indexing formula: $P_n = P_{n-1}$ (10% + 30% increase in average sector salary index + 60% French pipe construction index (*Moniteur des Travaux Publics*) SONES Renewal: - 6,000 connections per year; - 30km of pipe in 2006, 43km from 2007 to 2010 and 13km in 2011 Performance contract (amendment 1) SONES - Undertakes to complete the works program to deadline - Adjusts the financial model each year and submits proposals to the Ministry of Water on the tariffs to be applied over the course of the next 3 financial years to ensure the sector's financial viability - Must demonstrate its ability to finance the work assigned to it before the 1st January. If partially unable to fund the work as validated by the monitoring committee, and should SONES run out of funds, SDE can finance and carry out all or part of the work, using the unit price schedule, and deduct the cost of the work from the fees to be paid to SONES the following year SDE - If facilities are insufficient, must submit proposals on the measures that need to be taken - Propose a program for renewals to be covered by SONES by the end of July for approval by the end of September; tacitly approved after 31/10 Monitoring committee: a representative from the Primature joins the monitoring committee
10 August 2006	Amendment 1 to the concession contract (signatories include the Prime Minister, Macky Sall, now President of Senegal)	Reasons: - 5 year extension of the affermage contract - Replace the service development contract with a performance contract, with SONES committing to a performance indicator - Share funding for renewal 5-year performance contract (IP Appendix 1 p.25) SONES - Prepares a 10-year urban water supply master plan, with a detailed 5-year investment program, in conjunction with SDE - Achieves financial viability if turnover/debt >1 and able to fund its working capital requirement and its share of investment - Undertakes to finance and implement treatment facilities to meet physico-chemical quality targets - Rehabilitates 30km then 43km then 13km of pipework per year and 6,000 connections per year - Conducts a customer survey every 2 years - Plans investment using a ratio of 8.7 people per connection and 33 people per standpost - Commits to a value to cover debt servicing and for its debt ratio State - Undertakes to ensure SONES achieves financial viability via a tariff increase/debt relief/ reduction in interest rates on the repaid debt - Undertakes to follow the action plan to reduce public authorities' water consumption - Makes alternative water resources available to crop-growers - Can revise tariffs, taking the impacts of any revision on SONES and SDE into account, to ensure financial viability of the sector - Can delegate concession contract monitoring to the monitoring committee or any other body created for this purpose Monitoring committee (representative from the Presidency, representative from the Primature, head of urban water supply, representative from the finance ministry, Chief Executive of SONES and Chief Executive of SDE on an advisory basis)

		- Settles any disputes around the 5-year investment program - Prepares an action plan to reduce the public authorities' water consumption, which it submits to the supervisory ministries each year - Monitors (through delegation) financial information, implementation of the 5-year investment program; conducts a regular technical audit of the work funded by SONES - Analyses the urban water supply master plan, updates the financial model used to fine-tune the tariffs Dispute resolution: The monitoring committee acts as ombudsman to amicably settle disputes between SONES and the operator or between the State, SONES and the operator; should the parties fail to come to an agreement, the parties or, failing this, the president of the regional court in Dakar are to select an arbiter, who has three months to resolve the dispute
Approved on 9 September 2010 and 14 October 2010	Amendment 4 / Amendment 5 to the affermage contract	Reason: The ministry announced that the affermage contract due to expire on 23 April 2011 would not be renewed. The Government wants to place the entire service under concession. Purpose: extension until 31 December 2012, the date the concession contract is set to enter into force. Memorandum of Understanding (MoU) between the State and SDE signed on 12 May 2011, an MoU "to switch on an exclusive basis to a new institutional framework that creates new momentum in the water sector" "The State wants to make SDE more accountable by involving SDE in funding, managing and implementing investment". Purpose: to define the principles of a 30-year water service, sanitation service and stormwater management concession contract for Dakar and inland cities that will enter into force on 1st January 2013 SDE must submit an investment proposal (to construct two solar desalination plants to treat 150,000 m3/d)
Approved on 31 December 2012	Amendment 6 to the affermage contract	Purpose: One-year contract extension, up to 31/12/2013 Negotiations to start in January 2013 to extend the contract for 5 years if all conditions are met F_o to remain unchanged until negotiations have been completed

Signed on 27 December 2013, applicable from 1st January 2014	Amendment 7 to the affermage contract	Reason: The Government decided to increase the leaseholder's involvement in implementing investment, but not as part of a total concession contract
		
		Purpose: 5-year extension of the affermage contract to ensure continuity of public service
		
		SDE
		- Renewal:
		  o Leaseholder to fund network and connection renewal (60km of network, 12,000 connections each year)
		  o Electromechanical equipment of up to 30 million CFA Francs (2014) with no lifespan limit
		  o 20,000 meter per year
		  o All assets financed by the leaseholder are acquired from the leaseholder at their residual book value at the end of the contract
		- Scope: Obligation to include all areas in which SONES may construct facilities, including villages
		- F_o before indexing rises between 2014 and 2016 (362 CFA Francs/m^3 to 366.5 CFA Francs/ m^3) then falls until 2018 (363.8 CFA Francs/ m^3)
		- F_o indexing and unit prices to be finalized before 31 December 2013 (thus not in appendix) and to factor in expenditure on electricity and chemicals at the new iron removal and defluoridation plants
		
		SONES
		- Water quality: "Exceptions shall be granted to the leaseholder by the leasing authority and SONES for all water whose (physico-chemical quality) content levels are higher than WHO recommendations"
		
		Reporting
		- Pipework plans updated and submitted in hard and soft copy
		
		Amendment 2 to the performance contract, signed 15 November 2013 (IP SDE in Appendix A)
		2014-2025 urban water master plan to be defined for the 5 years covered by the contract as part of a five-year investment plan

1st January 2014	Amendment 2 to the concession contract and appendices	Reason: - 5-year extension of the affermage contract after the total concession approach was abandoned - Increase the electromechanical equipment renewal threshold to 30 million CFA Francs (2014) SONES Work - Network renewal: everything not covered in the SDE renewal contract scope - Connection renewal: everything not covered in the SDE renewal contract scope - SDE can, in agreement with SONES, carry out renewal work to be paid for by SONES and deducted from the monthly fees - Network renewal studies undertaken by the leaseholder are invoiced in line with the unit price schedule - SDE schedules all renewal work, including than funded by SONES

		Dispute resolution: The inter-ministerial monitoring and audit committee is to settle any disputes relating to interpretation of the concession contract Performance contract State - Undertakes to review its water consumption by 30 June - Undertakes to plan all expenditure not covered by the amending finance act - Undertakes to restrict water for vegetable-growers to 12,000m3 /year Monitoring and audits - The monitoring committee is to meet at least once a quarter - The monitoring committee ensures that the performance contract is being carried out effectively - The monitoring committee can review the performance contract objectives Inter-ministerial committee - Monitors implementation of the concession contract and its appendices on behalf of the State
Approved on 14 October 2014	Amendment 8 to the affermage contract	Reason: - Deficit of 20,000m3/d in Dakar despite SONES taking emergency measures to inject 18,000m3 into the system - Development of a second program to secure water supply provision for Dakar by constructing an emergency production facility (60,000m3/j) in December 2015 - Identify pre-financing mechanisms to fund this construction work Solution: - The leaseholder is to submit an emergency investment program to reduce the deficit in the Dakar area, in addition to the 5-year investment program - The leaseholder is to fund and implement the program's emergency investment in water production and distribution infrastructure from 2014 to 2018 - The conditions of repayment relating to this work are yet to be determined Amendment 3 to the performance contract, signed on 30/10/2014 to incorporate the leaseholder's role in completing the emergency work

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