



Providing for the People: Policy Note on Utility Service Reform in Mauritania's Mining Corridor

A POVERTY AND SOCIAL IMPACT ANALYSIS | SOCIAL DEVELOPMENT DEPARTMENT | AFRICA REGION – POST CONFLICT & SOCIAL DEVELOPMENT



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Providing for the People:
Policy Note on Utility Service Reform in
Mauritania's Mining Corridor

A Poverty and Social Impact Analysis



Africa Region (Post Conflict & Social Development) and
The Social Development Department
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1 USD = 239.0 UM

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ACRONYMS AND ABBREVIATIONS

ADER	Agency for the Development of Rural Electrification (<i>Agence de développement de l'électricité rurale</i>)
ANEPA	National Potable Water and Sanitation Agency (<i>Agence nationale de l'eau potable et de l'assainissement</i>)
APAUS	Agency for the Promotion of Universal Access to Regulated Services (<i>Agence de promotion de l'accès universel aux services</i>)
ARM	Multisectoral Regulatory Authority (<i>Autorité de régulation multi-sectorielle</i>)
CAS	Country Assistance Strategy (<i>Stratégie d'assistance pays</i>)
MDRE	Ministry for Rural Development and the Environment (<i>Ministère du développement rural et de l'environnement</i>)
MHE	Ministry of Water and Energy (<i>Ministère de l'hydraulique et de l'énergie</i>)
MMI	Ministry of Mines and Industry (<i>Ministère des mines et de l'industrie</i>)
Moughataa	Administrative district; there are 53 moughataas in Mauritania
NGO	Nongovernmental Organization
NZC	Nouadhibou-Zouerat Corridor
ONS	National Statistics Office (<i>Office national de la statistique</i>)
PDU	Urban Development Program (<i>Programme de développement urbain</i>)
PRISM	Mining Sector Capacity Building Project (<i>Projet de renforcement institutionnel du secteur minier</i>)
PRSP	Poverty Reduction Strategy Paper
SME	Small and Medium Enterprise
SNDE	National Water Society (<i>Société nationale d'eau</i>)
SNIM	National Industry and Mining Society (<i>Société nationale industrielle et minière</i>)
SOE	State-Owned Enterprise
SOMELEC	Mauritanian Electricity Society (<i>Société Mauritanienne d'électricité</i>)
SONELEC	Former water and electricity society, now split into two separate entities (SNDE and SOMELEC)
UCPM	Mining Project Coordination Unit (<i>Unité de coordination du projet minier</i>)
UM	Ouguiya (Mauritanian Currency Unit)

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Acknowledgements

This report presents the results of field research and a consultative process on a proposed reform in Mauritania's mining sector. Its intention is to provide empirical evidence on the gains and risks associated with transferring utility service provision from the national mining company SNIM to a new operator. The results from this research, presented from the recipient's perspective, as well as an intensive discussion process addressing unresolved transfer issues, will allow key stakeholders to buy into and actively support the reform process, while protecting access to essential social services for identified vulnerable groups.

The Poverty and Social Impact Analysis was produced by a team led by Salamata Bal (AFTCS) and Renate Kirsch (SDV), and consisting of David Hall, Nils Junge and Jean-Loup Jourdain (consultants). The field research was conducted by Amadou Sall (qualitative analysis) and the consultancy firm Tenmiya, under the supervision of Tandia Madioury and Mohamed Ould Tourad (quantitative analysis). The final report was written with input from Clemens Gros and edited by Payton Deeks. Gillette Hall, David Post and Danielle Christophe (SDV) helped us getting the document in shape for publication.

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Executive Summary

1. This policy note summarizes the results of a Poverty and Social Impact Analysis (PSIA) and a consultative decision making process in Mauritania carried out from 2005-2007. The analysis reviews a reform that proposes transferring water and electricity services provided by the national mining company SNIM in the Nouadhibou-Zouerat mining corridor to another provider.
2. The objectives of this PSIA were to (a) assess the distributional impacts of the proposed transfer of ancillary services on different social groups, with a particular focus on the poor; (b) engage key stakeholders in a debate about the social and economic gains, costs, and trade-offs of the different transfer options; and (c) analyze and explore options for generating stakeholder support for implementing the preferred transfer option.
3. All settlements in the Nouadhibou-Zouerat corridor are entirely dependent on SNIM for the provision of water and electricity services. **However**, SNIM does not have the expertise necessary to reliably serve a growing population in the corridor that is not affiliated with the company but still serviced by SNIM. This mismatch between SNIM's capabilities and the demand for services has resulted in strong and widespread consumer dissatisfaction, even in Zouerat's most privileged neighborhood, the SNIM Cité, where only SNIM employees live. Moreover, SNIM's practice of providing its employees with utility services for free or at highly subsidized prices has created significant inequalities in the access to, and quality of, service provision between the mining company's workforce (mostly living in the SNIM Cité) and the rest of the population in the corridor.
4. From an economic point of view, the current situation is also problematic as the provision of utility services is a drain on the fiscal resources of the company and detracts from the reinvestment in modernizing the mining equipment necessary for increased production.
5. Despite the government's interest in transferring utility services to a professional service operator (as envisaged by Mauritania's Electricity Act of 2001 and the new Water Act of 2005), SNIM has expressed major reservations about the proposals. This is because the company does not believe that nationally-mandated service providers (such as SOMELEC and SNDE) have the capacity to manage the production and distribution of water or electricity with the degree of reliability necessary for competitive mining production and employee satisfaction.
6. To explore potential options for service transfer, the PSIA analyzed the institutional capacity of operators who expressed an interest in providing services in the corridor. Results show that no single provider seems capable of operating utility services both in Zouerat and all other settlements in the NZC due to technical and/or financial capacity constraints. Hence, the capacity of potential operators needs to be built up before responsibility for the provision of services is transferred.

7. The PSIA also assessed the economic viability of transferring utility services from SNIM to another provider for each settlement in the corridor. Results indicate that in Zouerat it would be economically viable to have a single new operator manage water and electricity *distribution* in the whole city, including the SNIM Cité, while SNIM (which runs already well-working water and electricity production facilities) could continue to manage *production*. The same new distributor operating in Zouerat should also handle electricity services in F'Derick where service provision would be profitable if tariffs were increased to competitive levels. Water service provision in F'Derick could remain unchanged, with SNIM continuing to provide free power for pumping and heavy maintenance. Small and remote settlements such as Choum need external assistance because no economically viable utility service operation is possible in the medium term.
8. In terms of consumers' ability and willingness to pay, the PSIA showed that the expected tariff increases for water and electricity necessary to achieve improvements in service provision would exceed most poor households' ability to pay (i.e. spending more than 5% of total household expenditures on each utility). Given that the majority of higher income households spend less than 2.5% of their total expenditures on water, there may be room for an increase in tariffs for these groups and the possibility to cross-subsidize poorer consumers.
9. Some consumer groups have been shown to be particularly vulnerable to changes in the status quo and need to be protected by mitigating measures. Small and medium enterprises, market gardeners, and livestock producers are at risk of losing access to water and/or electricity services if tariffs increase. Moreover, poor households, numerically the most significant vulnerable group (25% of the population in the target settlements, living on 10 000 UM/month or about US \$0.25 per person per day), are at risk of losing access to essential services if the increase occurs.
10. The Municipality of Zouerat is also considered to be a potential loser of the reform. Since water re-sale (provided for free by SNIM to the Municipality) is the single most important source of revenue for this level of local government, and the Municipality is at risk of being excluded from the future distribution system, the proposed reforms could result in substantial revenue losses.
11. Policy options have been identified to mitigate the risks of reform for vulnerable groups. First, stepped tariffs for water and electricity can be introduced to design pricing structures according to what households can afford to pay. Second, the future operator should devise mechanisms that allow for connection costs to be spread over time so that households can make payments for their connection to the grid according to their present ability to pay. Third, the reform design should incorporate protective measures for the poorest households, e.g. a life-line tariff structure. Fourth, general access to water for the wider population should be made easier and cheaper through community managed standpipes. This management system would also serve resting nomads better, who visit the city in hot summer months with their herds and can cause steep increases in water consumption for short periods of time. Fifth, market gardeners, who rely on waste-water for irrigation purposes, should be

granted safe access to pre-treated wastewater to reduce health risks for the population. Finally, the Municipalities should be assigned a new role in the future service delivery system so that they can continue to generate revenue.

12. Weighing risks against benefits, the overall conclusion of the Poverty and Social Impact Analysis is that the positive effects of reform will outweigh its potential risks. First, SNIM's competitiveness will be strengthened and the company will be able to make new investments in its core mining business again. Second, over time the new utility provider will play a significant role in the overall development of the Corridor, including the reduction of social inequalities in access to essential social services. Third, the Municipalities could participate in the the new service delivery systems. Finally, and most importantly, consumers will be able to access water and electricity services that are safe and reliable at prices that most can afford.
13. The way forward for implementing the necessary reform measures was outlined in a stakeholder workshop, held in Nouadhibou in January 2007. Stakeholders agreed that the desirable solution for Zouerat would be one single operator, selected by public tender, in charge of the distribution of water and electricity for the whole community, but excluding industrial mining facilities.
14. Electricity distribution in F'Derick should remain with the same operator that will be in charge of electricity distribution in Zouerat because of their proximity and for the sake of efficient use of resources. The present situation in F'Derick is satisfactory with a private operator selected by ANEPA currently providing water services.
15. The suggested solution for Choum is the application of national policies to the settlements located in this area (i.e. establishing local operators according to the solutions developed by ANEPA and ADER).
16. The success of establishing a local operator for water and electricity services largely depends on investments in the distribution network. Therefore SNIM or other potential new operators have to negotiate the financing of necessary investments with government and possibly with donor agencies. A task force has been set up to facilitate this process, and will receive support from the Bank's PRISM project.
17. Progress in implementing the PSIA recommendations has been challenged by the difficult political situation in Mauritania (caused by two coup d'états). However, stakeholders have voiced an interest in resuming implementation once the political turbulences in the country have eased. The PRISM project responded to the PSIA exercise by including a social component in the second phase of the project, which provides the conceptual and financial space necessary to support the transfer of services once the political situation stabilizes. The two main government entities (SNIM and the Ministry of Hydraulic and Energy) that will have to initiate and facilitate the reform process are confident that they have gained sufficient public and political support to move ahead.

1. Introduction

1.1 This policy note summarizes the results of a Poverty and Social Impact Analysis (PSIA) and a consultative decision making process carried out over a two-year period (2005–2007).¹ The analysis reviews a reform that proposes transferring water and electricity services provided by the national mining company SNIM in the Nouadhibou-Zouerat mining corridor to another provider. As the population has increased, the provision of these services has become more and more problematic and constitutes a drain on the company's fiscal resources, threatening its competitiveness. SNIM also does not have the expertise of a professional utility operator to reliably serve a growing population in the corridor, resulting in strong consumer dissatisfaction, particularly by people not employed by SNIM and excluded from its benefit packages. Accordingly, the Government of Mauritania has proposed the transfer of water and electricity services from SNIM to a professional utility service provider in order to reduce the fiscal pressure on SNIM and clarify the roles and responsibilities of the mining company vis-à-vis local government.

1.2 The objectives of this PSIA were to (a) assess the distributional impacts of the proposed transfer of ancillary services on different social groups, with a particular focus on the poor; **(b)** engage key stakeholders in a debate about the social and economic gains, costs, and trade-offs of the different transfer options; and **(c)** analyze and explore options to gain stakeholders support for implementing the preferred transfer option, thereby contributing to a more evidence based, inclusive and transparent decision making process. The analysis includes a stakeholder and institutional analysis, a Consumer Assessment, and an economic feasibility study, using both quantitative and qualitative methods. The consultative decision making process was based on focus group discussions, stakeholder workshops, and the establishment of a technical and political steering group.

1.3 The primary purpose of this report is to inform the national stakeholders involved in the reform process in Mauritania. This audience will use the report as justification and guidance in forthcoming decision making related to the implementation of the reform. **The second purpose of this document is to present a country case study to a wider group of people interested in learning how the PSIA approach can be applied and used in a specific sector or country context.** For this audience, the country example illustrates that using the interdisciplinary perspective of social and economic analysis allows for a richer and more comprehensive understanding of the potential impacts of reform on the population. Moreover, the section on political economy of reform implementation draws attention to the fact that analyzing distributional impacts alone is often

¹ The following reports, commissioned by or related to the PRISM project, fed into this policy note: Economic Assessment of Reforms to the Provision of Ancillary Services in the Mauritanian Mining Sector, PRISM Project, February 2007; Consumer Assessment of Reforms to the Provision of Ancillary Services in the Mauritanian Mining Sector, World Bank, February 2006; Enquête quantitative sur l'évaluation des consommateurs, Secteur de l'eau et de l'électricité dans les trois localités (Zouérat-Choum-F'Dérick), Tenmiya, November 2006. Analyse de l'impact social de l'évaluation de la gestion des prestations d'électricité et d'eau dans les localités de Zouerate, F'Derick et Choum. Etude qualitative Amadou Sall, 2006.

not sufficient in identifying crucial bottlenecks and risks to the reform. In this case, previous analytical inputs did not help to move the reform process forward because stakeholders' interests, their potential to influence the reform and power relations among stakeholders were not adequately understood and addressed. As a consequence, the reform process stalled. Finally, this case shows that combining stakeholder participation and consultations with analytical research can help overcome obstacles to reform and move the implementation process forward.

1.4 Results of this report directly inform the World Bank's Second Mining Sector Capacity Building Project (Projet de Renforcement Institutionnel du Secteur Minier, PRISM), who commissioned this work. The road map for reform implementation (section 6 of the report) outlines how the PRISM team can support the process of transferring utility services from SNIM to any other entity, thereby facilitating a successful reform outcome. These insights contribute to reaching some of PRISM's objectives, namely (a) to build-up and consolidate the Government's long-term institutional and technical capacity to manage the country's mineral resources, including social and environmental management; (b) promote private investments in the mineral sector and (c) improve the mineral sector's contribution to national and regional socio-economic development. Under PRISM, the emphasis has been placed on the need for non-mining, local economic development and the improvement of social services in mining areas.

1.5 Structure of the report: **Chapter 2** presents the country and reform context by providing background information on the role of mining in Mauritania's economy and explaining the current situation in the Nouadhibou-Zouerat economic corridor with regard to water and electricity services. This section indicates the need for reform by reviewing the reform context from a legal, economic, institutional, technical and consumer perspective. **Chapter 3** introduces previous reform proposals and discusses the economic viability of the most plausible reform option. **Chapter 4** outlines the potential social and poverty impacts of utility service reform by presenting survey results on consumers' ability and willingness to pay, showing which social groups are at risk of being negatively affected by reform and exploring policy responses to the identified risks. It also weighs the risks associated with reform against its benefits and provides policy recommendations. Issues associated with the political economy of reform implementation are discussed in **chapter 5**, which concludes by making specific recommendations for the implementation of the necessary reform measures (**chapter 6**).

2. Reform Context

2.1 Approximately 40,000 people live in the economic corridor that stretches some 650 kilometers from the port of Nouadhibou in the north of the country through the desert to the iron ore mines near Zouerat in the east. The mining town of Zouerat with its 31,000 inhabitants is by far the largest settlement in the corridor, followed by F'Derick and Choum, each with a population of about 3,000. The other seven settlements in the corridor have less than 800 inhabitants each. Half of the adult population in the Nouadhibou-Zouerat economic corridor is employed directly by SNIM or its affiliates. Residents of the corridor have a relatively high standard of living on a wide range of indicators when compared with other parts of the country. The rest of the adult population are family members of employees, semi-settled nomad families and semi-permanent refugees from the Western Sahara. Job opportunities in the mining sector are the main reason for people to settle in the midst of the Sahara desert: one out of every two adults in the corridor is a migrant to the area. Unemployment levels are relative low, but show clear gender differences with only 19% of men being unemployed compared to 48% of women.

ENHANCING THE INTERNATIONAL COMPETITIVENESS OF THE MINING SECTOR IN MAURITANIA

2.2 Iron ore accounts for about 50 % of Mauritania's total exports (12 % of GDP) and is a major source of foreign exchange. The ample reserves are expected to permit exports at current levels for at least a century to come. The state-owned mining company SNIM (Société Nationale Industrielle et Minière) exports over 10 million tons of ore annually and generates around US \$180 million in sales, of which approximately US \$20 million are transferred directly to the Government.

2.3 Structural reforms in the mining sector were first undertaken in 1997, and aimed to accelerate the growth of the mining sector through the removal of obstacles for private sector engagement. These reforms were aimed at reducing the involvement of the State in mining exploration and development activities; promoting private sector investment in the mining sector; building the capacity of agencies involved in regulating mining activities and developing the environmental and "social management" aspects of mining.²

2.4 These mining sector reforms have taken place in the context of the Government's broader efforts to liberalize the economy and attract investment. Reform efforts have included, for example, revisions to the Investment Code and the Commercial Code to adopt more free market principles in Mauritania's economy. Together with prudent fiscal and monetary policies, these reforms contribute to better market performance in mining and other key sectors.

² World Bank, Project, *Project Summary*, Mining Sector Capacity Building Project ID P057875.

2.5 However, none of these reforms have resulted in the privatization of Mauritania's largest mine in Zouerat, which remains firmly in the hands of the Government through its state-owned mining company SNIM. Nor have they resulted in the privatization of the national electricity company (SOMELEC) despite repeated efforts to do so. The following paragraphs show that a lack of reform has had important implications for the population living in the economic corridor that stretches from Nouadhibou in the west to Zouerat in the north east.

ACCESS TO AND QUALITY OF WATER AND ELECTRICITY SERVICES IN CITIES ALONG THE CORRIDOR

2.6 All settlements in the Nouadhibou-Zouerat corridor are entirely dependent on SNIM for the provision of water and electricity services. The company itself created and maintained the relevant infrastructure in this wasteland area of Mauritania to operate its mines and supply its workforce with essential utilities. SNIM employees receive preference in service as an incentive to move to the north of the country. This practice created **significant inequalities in the access to, and quality of, service provision between the mining company's workforce and the rest of the population living in the corridor.** It is this growing inequality which makes the status quo unacceptable for both consumers and the Government.

2.7 In the SNIM Cité the mining company provides free housing, water, and electricity services to its workforce. There is excellent access to water and electricity through piped and secure networks in this neighborhood of Zouerat. The neighborhood has been built and maintained by SNIM exclusively for SNIM employees and their families. This group accounts for approximately one quarter of the corridor's population. Consumer perceptions rate the quality of services provided in the SNIM Cité as good. As such, their level of satisfaction is high. However, demand for water already exceeds supply in the Cité which translates into water rationing in the piped network. Similarly critical, all water pumped and distributed by SNIM comes exclusively from non-renewable aquifers which are estimated to carry enough water only for the next ten years. Recent hydro-drillings have not succeeded in finding new water reservoirs which are needed to sustain life and production in the desert. Moreover, although the SNIM Cité is the only settlement in the corridor which has a piped wastewater drainage system, all wastewater is discharged outside the Cité untreated.

2.8 People living outside the SNIM Cité in Zouerat, in F'Derick, Choum or the smaller settlements (75% of the population in the corridor) experience very different levels of service provision. Access to services is limited and the reliability and quality of the services provided is generally considered to be poor (see table 1). In Zouerat people outside the Cité do not have access to water through a piped network. Instead, SNIM provides water at no cost to the Municipality for onward sale to consumers. The Municipality employs tanker trucks to distribute the water to household or communal cisterns and charges prices for this service that are almost four times the average national price (437 UM/m³ or US \$1.83/m³ as compared to 119 UM/m³ or US \$0.50/m³ national average). Individual households pay up to 1,250 UM/m³ (US \$5.23/m³) for water deliv-

Table 1: Consumer's perspective: Inequality in access to and quality of utility services. Total population in the three study towns: 37,000 (100 %)

	Zouerat Population: 31,000 = 84 % of total population in study towns		F'Derick Population: 3000 (8 %)	Choum Population: 3000 (8 %)
	SNIM Cité Pop. 11,100 (30 %)	Non-SNIM Pop. 19,900 (54 %)		
Access to water and reliability of service	Universal and reliable access through piped network	Irregular access to poor quality, over-priced water through tanker trucks	Access to good quality water from F'Derick's own borehole; 66% of households have piped connection, 33 % access through less reliable standpipes	Irregular access to low quality water in short supply; no piped network (62% standpipes; 16% tanker trucks; 8% other sources)
Consumption per capita	84 liters/day		87 liters/day	87 liters/day
Price paid per m ³	0	437 UM (\$1.83)	75 UM (\$0.31)	120–200 UM (\$0.50–\$0.84)
Access to electricity and reliability of service	Universal and reliable access through planned and secured network	78% of households; frequent power cuts; illegal & non-secured connections consume up to 40% of power supply	Universal access between 10am and midnight	No access to electricity; power generator at SNIM base for communal refrigerators accessible by the public
Annual consumption per household	4810 kWh	1470 kWh	1992 kWh	n/a
Price paid per kWh	0	24.42 UM (\$0.10)	0	n/a

Source: PSIA generated data. In: *Economic Assessment of Reforms to the Provision of Ancillary Services in the Mauritanian Mining Sector, PRISM Project, February 2007.*

eries from tanker trucks (more than ten times the national average price). High demand and a restriction by SNIM on establishing new connections have contributed to the growth of a network of illegal water connections. Water loss from theft is estimated to amount to 20–30% of total production.

2.9 Electricity supply in Zouerat outside the SNIM Cité is similarly problematic.

While 80% of the population have access to electricity at reasonable prices (at 24 UM/kWh or US \$0.10/kWh the cost is actually below the national average tariff of 36 UM/kWh or US \$0.15/kWh), there are frequent power cuts and a very high rate of illegal, non-secured connections (which consume up to 40% of the power provided by SNIM outside the Cité). From the consumers' perspective there is widespread dissatisfaction with the quality and quantity of the services provided by SNIM.

2.10 The town of F'Derick is in the fortunate position to be located near a high yielding borehole with good quality water. Two thirds of the population procure water through a piped network and one third through standpipes at reasonable prices (75 UM/m³ or US \$0.31/m³). Since 2002, the distribution of water has been managed by the national water agency ANEPA (Agence National de L'Eau Potable et de L'Assainissement), with SNIM providing free power for pumping and free heavy maintenance. However, people living out of town still have to buy water from tanker trucks for up to 2500 UM/m³ (US \$10.46/m³). Members of women's groups also pointed out that access to water through standpipes is not only more expensive than piped connections, but also less reliable. However, new connections are often unaffordable to these households because the investment costs for a connection to the piped network has to be paid upfront – an amount of cash they cannot come up with. There are no provisions to accommodate poorer households' wishes to obtain household connections or ease the burden of these high upfront investment costs. Electricity in F'Derick is provided by SNIM for free through a medium tension line from Zouerat. Virtually all households have a connection and access to free electricity.

2.11 Most problematic is the case of Choum, where no piped network for water supply exists and people have to buy poor quality water from standpipes and tanker deliveries at prices ranging from 120 to 200 UM/m³ (US \$0.50 to \$0.84/m³). Even this low quality water is often in short supply. A recent attempt to improve the provision of water services through a solar-powered system run by ANEPA has not met people's expectations of improved service delivery. People do not have access to electricity in Choum, though a generator supplying the small SNIM base gives people the opportunity to store perishable aliments in communal refrigerators.

ECONOMIC AND LEGAL LIMITATIONS FOR SNIM TO PROVIDE UTILITY SERVICES IN THE CORRIDOR

2.12 SNIM has shown a high degree of corporate social responsibility to the people living in the corridor by making the utility services available as good as possible. But from an economic point of view, the current situation is problematic as the provision of utility services is a drain on the fiscal resources of the company and detracts from reinvestment in modernizing the mining equipment (which would allow for increased production). In Zouerat alone, the company incurs annual costs for domestic water supply of about 130 million UM (US \$544,000) without any cost recovery. Similarly, SNIM bears the costs of electricity supply for domestic purposes in Zouerat at about 341 million UM (US \$1.4 million) per year, excluding investment costs, with only partial cost recovery from non-Cité households at 133 million UM (US \$558,000)³. Hence, maintaining the status quo would require a significant continued burden on the mining company's finances.

2.13 From a legal perspective, the present situation places the company at odds with national policies that have established and mandated specific institutions to

³ Numbers of 2005.

supply water and electricity services in both rural and urban areas. The new laws on water and electricity service provision⁴ encourage partnerships between the state, local institutions, and the private sector in financing, managing and operating both water and electricity services. There are several public or semi-public entities that are now specifically mandated to take over utility service operations in Mauritania. The state-owned electricity supplier SOMELEC (Société Mauritanienne d'Electricité) is mandated to produce, distribute, and sell electricity in urban areas with populations over 5,000 inhabitants. The company would be willing and prepared to take over electricity supply and distribution in Zouerat. Likewise, the Agency for the Development of Rural Electrification (L'Agence de Développement de l'Électrification Rurale, ADER)⁵ and the Agency for the Promotion of Universal Access to Regulated Services (L'Agence de Promotion d'Accès Universel aux Services Régulés, APAUS)⁶ would both be willing to manage electricity supply and distribution in F'Derick and Choum. With regard to water services, the National Water Society (Société Nationale des Eaux, SNDE)⁷ is fully prepared to manage water supply and distribution in Zouerat. The National Potable Water and Sanitation Agency (L'Agence Nationale d'Eau Potable et d'Assainissement, ANEPA)⁸ would be ready to supply rural and peri-urban areas not covered by SNDE (F'Derick and Choum), as long as SNIM would continue to provide some technical support. While there has already been some moderate progress in the water sector (eg. ANEPA's active role in developing a new water system for F'Derick in cooperation with SNIM), progress in licensing private sector operators for electricity production and distribution in the electricity sector has largely stalled. Indeed, no suitable investors could be found. As such, one objective of the World Bank's PRISM project is to build up capacity among these implementing agencies to take over utility services from SNIM.

2.14 Despite the government's interest in transferring utility services, SNIM has expressed reservations about this proposal: The company itself does not believe that nationally-mandated service providers (such as SOMELEC and SNDE) have the capacity to manage the production and distribution of water or electricity with the degree of reliability necessary for competitive mining production and employee satisfaction. SNIM fears that the reform will cause them to lose control over essential factors of production, thereby putting the viability and expansion of its business at risk. (A more detailed analysis of the institutional capacity of potential service providers is presented in chapter 3). Subsequently, the Government has not pressured SNIM to comply with its policy

⁴ A new Electricity Act was adopted in 2001 and a new Water Act was passed in 2005.

⁵ ADER is responsible for rural areas where off-grid solar or mini thermal systems are most appropriate. It was set up in 2000 with an initial target of some 3,500 villages across the country.

⁶ APAUS operates under the Ministry of Economic Affairs and Development. It is a multisectoral agency that promotes access to water, electricity and telecommunications in parts of the country that would not normally be considered economically viable by utility companies. In this respect, APAUS is considered to be an instrument of the Government's poverty alleviation strategy. Projects are a joint effort involving APAUS, the commune and a private sector manager.

⁷ SNDE was created by decree in July 2001 when the old water and electricity corporation (SONELEC) was split up into separate utility companies. It has full responsibility for the production, distribution and sale of water in urban areas according to national tariffs agreed with the Ministry.

⁸ ANEPA was also created in 2001. It has the mandate to supply rural and peri-urban areas not covered by SNDE with water. It has over 370 projects supplying water schemes of different sizes around the country.

and legal frameworks, largely because of the company's potency and importance for the state.

Table 2: A comparison between Mauritania's legal framework for water and electricity supply and distribution and the current situation.

Locality \ Utility	Water		Electricity	
	Legal Mandate	Status Quo: Service provided by	Legal Mandate	Status Quo: Service provided by
Zouerat	<u>SNDE</u> (National Water Society)	SNIM	<u>SOMELEC</u> (Société Mauritanienne d'Electricité)	SNIM
F'Derick	<u>ANEPA</u> (National Potable Water and Sanitation Agency)	SNIM	<u>ADER</u> (Agency for the Development of Rural Electrification)	SNIM
Choum	<u>ANEPA</u> (National Potable Water and Sanitation Agency)	ANEPA in cooperation with SNIM	<u>ADER</u> (Agency for the Development of Rural Electrification), <u>APAUS</u> (Agency for the Promotion of Universal Access to Regulated Services)	SNIM

3. Reform Proposals and Their Economic Viability

3.1 The PRISM project sought to engage stakeholders in a constructive dialogue to promote reform and commissioned – as an initial input for discussion – a study which explores options and scenarios for a potential transfer of ancillary services from SNIM to a private or public utility service provider. The ETASCO/TASMIN report

Table 3: Summary of utility service reform options as proposed by the ETASCO study

Utility Locality	Water	Electricity
Zouerat	<p><u>Option 1:</u> Production: provided by SNIM Distribution: concession to a 3rd party</p> <p><u>Option 2:</u> Production and distribution by 3rd party</p> <p><u>Option 3:</u> BOT (Build, Operate and Transfer)⁹</p>	<p><u>Option 1:</u> Generation: provided by SNIM Distribution: SOMELEC (state-owned electricity company.)</p> <p><u>Option 2:</u> Production: provided by SNIM Distribution: BOT</p> <p><u>Option 3:</u> Production (except for industrial purposes) and distribution by 3rd party (SOMELEC)</p>
F'Derick	<p><u>Option 1:</u> Production: provided by SNIM Distribution: concession to a 3rd party (ANEPA, GIER, ...)</p> <p><u>Option 2:</u> Production and distribution by 3rd party</p> <p><u>Option 3:</u> Production: provided by SNIM or a 3rd party by concession Distribution: service or operating lease agreement with 3rd party</p>	<p><u>Option 1:</u> Generation: Maintain status quo, i.e. electricity supply from Zouerat Distribution: Managed by the Zouerat operator, following economic rationale</p>
Choum	<p><u>Option 1:</u> Service or operating lease agreement between APAUS and a 3rd party</p>	<p><u>Option 1:</u> Service or operating lease agreement between APAUS and a 3rd party with the involvement of ADER</p>

Source: ETASCO/TASMIN report, p.7.

⁹ BOT would be a concession contract in which the government would grant a concession to a concessionaire who is responsible for the construction and operation of a facility over the period of the concession before finally transferring the facility, at no cost to the government, as a fully operational facility.

presents options ranging from a simple change in the pricing structure between miners and non-miners to a complete transfer of responsibilities for production, distribution and/or management of services to the local government and/or private providers and/or other state agencies.¹⁰

The report managed to ignite a discussion among stakeholders but did not lead to any concrete results as it failed to address many stakeholders concerns. The PSIA takes up the process where it stalled in 2004 by building on the scenarios developed in the ETASCO study and providing additional analyses to address stakeholder concerns.

3.2 In addition to the ETASCO report, the PSIA assessed the economic viability of reform options for each settlement. Reform option 1 (i.e. in Zouerat and F'Derick *production* would remain with SNIM since the company runs already well-working water and electricity production facilities, while the *distribution* of both utilities would be transferred to a single new operator) **was identified as the most economically reasonable option.** In the case of Choum, professionally managed production and distribution would have to be set up by a new operator since virtually no infrastructure exists.

3.3 Results of the economic analysis indicate that in Zouerat reform option 1 would be economically feasible if a single new operator was mandated to distribute water and electricity in the whole city, including the SNIM Cité. Excluding the Cité from the service mandate would render all operations unprofitable as most high income consumers live in this neighborhood. These better-off customers would be able to pay the prices set by the new tariff structure, which would be a prerequisite for some kind of cross-subsidies to poorer households.

With regard to **electricity**, results from the analysis indicate that if a new operator were to maintain the current tariffs charged by SNIM (24.42 UM/kWh or US \$0.10/kWh) it would incur an annual deficit greater than 100 million UM (US \$418,000). If the tariff were to be increased by 51 % to the national SOMELEC tariff of 38 UM/kWh (US \$0.15/kWh) a profit of about 100 million UM (US \$418,000) per year could be made. However, taking into account the recent change in SNIM's short term marginal costs (an increase of almost 50% between 2005 and 2006 due to increases in petroleum prices), using the SOMELEC tariff would allow a break-even only for the period 2005–2015, with deficits during the first years of operation. Thus, the economic earnings of the operator would be very sensitive to the transfer price per kWh charged by SNIM.

¹⁰ Groupement ETASCO/TASMIM, *Assistance technique pour l'étude de la situation actuelle des services fournis aux communautés par la SNIM et des alternatives de gestion*, PRISM, 2004.

For Zouerat's **water** services, the model again assumed that a new operator would focus only on water distribution, i.e. selling bulk water supplied by SNIM onward to customers. Results show that charging the national SNDE water tariff of 118.9 UM/m³ (US \$0.49/m³), would still result in substantial losses for the operator (though it would improve revenue collection). The tariff would need to be increased to an average of 133.7 UM/m³ (US \$0.56/m³) to make service provision economically viable. The profitability of the water service operator could be further improved if SNIM were to contribute free power for pumping, as is already the case in F'Derick.

3.4 The same new distributor operating in Zouerat should also handle electricity services in F'Derick, which would be profitable if tariffs were increased to competitive levels. Water service provision in F'Derick could remain unchanged, with SNIM continuing to provide free power for pumping and heavy maintenance. Results from the modeling exercise show that tariffs would need to be increased to 36.32 UM/kWh

Table 4: Results of economic viability study: option 1 economically feasible (except for the city of Choum).

	Zouerat		F'Derick	Choum
	SNIM Cité	Non-SNIM		
Water				
Production	Provided by SNIM at short term marginal costs		ANEPA (with power for pumping and heavy maintenance provided by SNIM at no cost)	External assistance needed; in the meantime: production and distribution by SNIM via tanker trucks (status quo)
Distribution	Independent entity servicing both SNIM Cité and non-SNIM Zouerat		ANEPA	
Current prices paid per m ³	0	437 UM (\$1.83)	75 UM (\$0.31)	120–200 UM (\$0.50–\$0.84)
Projected future price per m ³ to make operation profitable	133.7 UM (\$0.56)		75 UM (\$0.31)	120–170 UM (\$0.50–\$0.71) but still not profitable
Electricity				
Production	Provided by SNIM at short term marginal costs		0	External assistance needed; prices of profitable operation would by far exceed ability to pay
Distribution	Independent entity servicing the whole city of Zouerat and F'Derick			
Current prices paid per kWh	0	24.42 UM (\$0.10)	0	(no access to electricity)
Projected future price per kWh to make operation profitable	36.77 UM (\$0.15)		36.32 UM (\$0.15)	91.52 UM (\$0.38) (not applicable; by far exceeding ability to pay)

Source: Economic Assessment of Reforms to the Provision of Ancillary Services in the Mauritanian Mining Sector, PRISM Project, February 2007.

(US \$0.15/kWh) to make electricity service provision profitable in the medium term (this tariff would still result in losses through about 2011, after which a balanced operation would be possible). The current situation of water supply in F' derick is satisfactory, with sufficient good quality water provided by an operator who conforms to the national norms and tariffs for small towns (ANEPA). However, the viability of the status quo might be at risk if SNIM decided to discontinue its free supply of power for water pumps. For this reason the Economic Assessment recommends a written agreement to be drawn up between ANEPA and SNIM for covering pumping costs, access to water (by SNIM) and heavy maintenance through SNIM.

3.5 Small and remote settlements such as Choum need external assistance because no economically viable utility service operation is possible in the medium term. In Choum, the economic modeling showed that neither water nor electricity supply and distribution can be managed as commercially viable operations. To make service provision profitable, the operator would have to charge prices that would be prohibitive from a household perspective. Hence, smaller “off-grid” settlements would require external assistance in the form of government subsidies in order to enjoy levels of service that are similar to those of larger communities. However, a transition period where SNIM stays financially involved could be discussed if this were to occur.

3.6 In conclusion, the distribution of water and electricity services to citizens in the corridor is only partially economically viable for a new operator that would impose tariff structures above the national average. The recognized business constraints severely limit the options for transfer of services. It might therefore be necessary to combine the management of water and electricity distribution in the hands of a single new operator instead of having separate companies in charge of water and of electricity services. The risk of economic loss can be reduced if SNIM maintains its high degree of social corporate responsibility and contributes to certain costs, like pumping costs for water or drilling costs to identify new water resources. However, the analysis was carried out at a pre-feasibility stage where exact details on future tariff structures or levels of service were not yet known. Therefore, the actual prices necessary to make service provision profitable for the new operator might differ from the prices calculated in this analysis.

INSTITUTIONAL CAPACITY OF POTENTIAL UTILITY OPERATORS

3.7 The PSIA also analyzed the institutional capacity of operators who expressed an interest in providing services in the corridor in more detail. Results show that no provider seems capable of operating utility services both in Zouerat and all other settlements in the NZC. Service providers either lack the technical or financial capacity or they would require public financial support to undertake such a large scale operation (as is the case with ADER, ANEPA and SNDE). The uncertain legal status of SOMELEC is also critical. Previous attempts to privatize the state-owned electricity supplier have failed and a new strategic perspective for the company's future is not in sight. This situation implies a high degree of unpredictability for SNIM who would have to rely on SOMELEC's services as a utility provider. An overview on the legal status, the capacities

and constraints of each of the potential new operators is presented in the following paragraphs and summarized in table 5.

3.8 The **Agency for the Development of Rural Electrification (ADER)** is a semi-public enterprise under the control of the Ministry of Water and Energy. Financial contributions from consumers provide additional funding. It currently supplies electricity in rural areas where off-grid solar or mini thermal systems are most appropriate and would be interested in managing electricity generation (solar only) and distribution in the smaller settlements in the Nouadhibou-Zouerat economic corridor. ADER has already financed a feasibility study for operations in Choum and earmarked funding for the project. However, the technical and financial capacity of the company is considered limited. It will most likely need public financial assistance or support from a private investor to reliably service even the smaller settlements.

3.9 The **National Potable Water and Sanitation Agency (ANEPA)** is a private entity with Government contributions to its budget. It has the mandate to supply rural and peri-urban areas that are not serviced by SNDE with water (see below). ANEPA operates water supply in F'Derick in cooperation with SNIM and maintains projects in Choum. The company has an interest in generating and distributing water to all cities and settlements along the corridor except Zouerat since the mandate to service the city of Zouerat lies with SNDE. ANEPA has proven its financial and technical capacity to provide water to people in F'Derick and Choum and customers are relatively satisfied with the quality of services provided. Nevertheless, the company itself does not believe that it will be economically feasible to deliver water to the settlements along the corridor without public financial support.

3.10 The **Agency for the Promotion of Universal Access to Regulated Services (APAUS)** is a state-owned enterprise under the control of the Ministry of Economic Affairs and Development. Financial contributions from consumers provide additional funding. The Agency promotes access to water, electricity and telecom services in areas where service provision is economically not viable without financial assistance from the Government. It is thus eager to provide utility services in the smaller settlements along the NZC. APAUS also paid for a feasibility study for a project in Choum, but when it was discovered that ADER had done exactly the same one, this study was put on hold. The Agency has already proven its capacity to provide reliable services in the cities of Southern Mauritania and has gained experience in cooperating with the private sector. While this can be an advantage when scaling up operation in rural areas, there is also a risk of duplicating the efforts of ADER and ANEPA which have similar service mandates.

3.11 The **National Water Society (SNDE)** is a state-owned water service operator in urban areas whose management firmly believes in its mandate to generate and distribute water in the city of Zouerat as a whole, thus including the SNIM Cité. However, the company is willing to compromise in that they would agree to an arrangement where SNIM remained in charge of water supply for industrial purposes while SNDE would take over all domestic supply. SNDE's major constraint is its limited technical and financial capacity. It is not in a position to bear the investment costs necessary for water

source exploration missions or to finance future water generation. Hence, the provision of services by SNDE seems economically unviable and might require Government subsidies.

3.12 The **Mauritanian Electricity Society (SOMELEC)** is also a public service agency with a mandate to manage electricity supply in urban areas. SOMELEC would like to take over all aspects of power generation, distribution, and sales in the corridor. It has also expressed its interest in taking over SNIM's power plant, which is the largest in Mauritania. As is the case with most other implementing agencies, the technical and financial capacity of SOMELEC is considered limited. Adding to the problem is the fact that previous attempts to privatize SOMELEC have failed and left the company's legal status uncertain. This also poses a great risk for SNIM, which would have to rely on the services of SOMELEC as electricity supplier.

3.13 **The results of the institutional analysis suggest that plans to transfer utility service provision from SNIM to a single new operator may be inadvisable.** Given that none of the implementing agencies would technically or financially be able to reliably service all settlements in the Nouadhibou-Zouerat economic corridor, a stepwise transfer of services from SNIM to a consortium of operators in which SNIM initially is a large shareholder seems much more feasible. Responsibilities can be handed over after initial tasks are delivered successfully, capacity is built over time, and SNIM is comfortable with the arrangement. In the initial phase, the new operator(s) could manage solely the *distribution* of services to all inhabitants, eventually followed by also managing the *generation* of water and electricity. SNIM's concern regarding the high quality of service for its staff at the lowest possible costs could be addressed by considering a reimbursement arrangement between the new provider and SNIM, whereby SNIM covers the costs of its employees. Feasible recommendations on how to proceed with the transfer of services, which were refined in the PSIA stakeholder workshop of 2007, are given in the last chapter of this report.

Table 5: Implementing agencies, their mandates, interests, and capacity to become a reliable utility operator.

Agency	Status (public/ private)	Provision of service	Interests	Capacity and Risks
ADER (Agency for the Development of Rural Electrification)	Semi public under the control of Ministry of Water and Energy with participation of consumers	Electricity supply in rural areas where off-grid solar or mini thermal systems are most appropriate	Interested in becoming the service generator (solar only) and distributor for the smaller settlements. Already financed a feasibility study for Choum and earmarked funding for the project.	Limited technical and financial capacity; will need public assistance or private investor to cover even the smaller settlements reliably.
ANEPA (National Potable Water and Sanitation Agency)	Private enterprise with Government contributions to its budget	Water supply for rural and peri-urban areas not covered by SNDE	Operates water supply in F'Derick in cooperation with SNIM and maintains projects in Choum. Is interested	Has proven its financial and technical capacity to provide water to people in F'Derick and Choum with good customer

Agency	Status (public/ private)	Provision of service	Interests	Capacity and Risks
			in generating and distributing water to all cities and settlements along the corridor except Zouerat for which SNDE has the mandate to service the city.	satisfaction ratings. ANEPA is convinced that it will not be economically viable to deliver water to the settlements without public financial support.
APAUS (Agency for the Promotion of Universal Access to Regulated Services)	Public under the control of the Ministry of Economic Affairs and Development; Consumer contributions provide additional resources	Promoting access to water, electricity and telecom in areas where service provision is economically not viable without public support	Keen to provide utility services in the smaller settlements. Also paid for a feasibility study for a project in Choum, which was put on hold when it was discovered that ADER did the same.	Has proven its capacity to provide reliable and accessible services in Southern Mauritanian cities and has experience in cooperating with the private sector. Risk of duplicating the efforts of ADER and ANEPA
SNDE (National Water Society)	Public	Water supply in urban areas	Management is of the opinion that it is their mandate to generate and distribute water to all Zouerate citizens. Willing to compromise as they would agree to a situation where SNIM retained water supply for industrial purposes, but would hand over all domestic supply	Technical capacity existent but limited; financially not in the position to put up investment costs for future water resource identification and generation Provision of services seems economically unviable at the present level and might require government subsidies
SOMELEC (Société Mauritanienne d'Electricité)	Public	Electricity supply in urban areas	Keen to take over all aspects of power generation, distribution and sales in the corridor; would like to take over the SNIM power plant which is the largest in Mauritania.	Technical and financial capacity is considered limited. Previous attempts to privatize SOMELEC have failed, which leaves the legal status of the company uncertain.

Source: PSIA generated data.

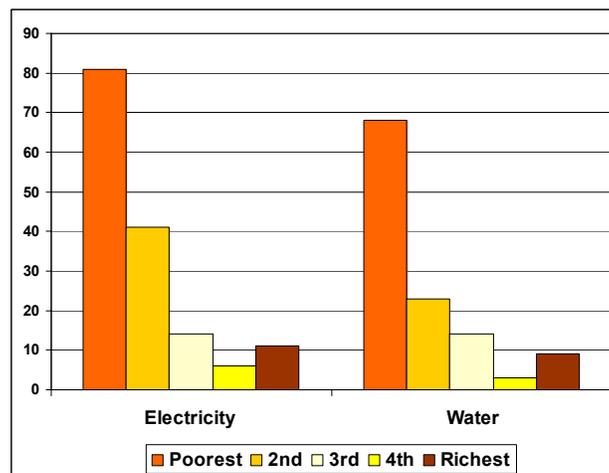
4. Likely Social and Poverty Impacts of Reform

4.1 A core focus of the PSIA was the identification of potential winners and losers of the proposed reform. Concerns included the following questions: How does the transfer of utility services impact consumer's access to water and electricity? Are groups at risk of losing access to services and how can this be avoided or mitigated? Who, at the community level, would be likely to support or oppose the reform idea? **These questions were assessed by relating the results of the economic analysis to consumer needs and analyzing whether consumers could or would be willing to pay these increased prices.** The analysis also revealed groups at risks of not having sufficient access to water and electricity services.

HOUSEHOLD SURVEY RESULTS ON THE ABILITY AND WILLINGNESS TO PAY OF HOUSEHOLDS IN THE MINING CORRIDOR

4.2 Evidence from the Consumer Assessment¹¹ clearly shows that the expected tariff increases assumed under the economic viability analysis (see table 4) would exceed most poor households' ability to pay. 80% of the poorest households (bottom income quintile) already spend more than 7.5% of total expenditures on electricity and 70% of the poorest households spend more than 7.5% of total expenditures on water. Assuming a reasonable affordability threshold of 5% of total household expenditures on each utility, the expected future prices will exceed the ability to pay of this lowest income group (which accounts for about one quarter of the population in the Nouadhibou-Zouerat corridor). **By contrast, the majority of households with regular incomes, headed by retired people, wage earners or business people, spend less than 2.5% of total household expenditures on water, suggesting some room for an increase in tariffs for these groups.**

Figure 1: Percentage of Households Spending more than 7.5% of Total Expenditures on Utility Services (Source: PSIA generated data, Consumer Assessment of Reforms to the Provision of Ancillary Services in the Mauritanian Mining Sector, World Bank, February 2006, p.54).



¹¹ Consumer Assessment of Reforms to the Provision of Ancillary Services in the Mauritanian Mining Sector, World Bank, February 2006.

Table 6: Water and Electricity Expenditures as Percentage of Total Expenditures

Occupation of Household Head	Water	Electricity	Other items	Total	% on water	% on elec.	% on both
Unemployed	3,395	5,364	55,519	64,278	5.3	9.7	14.9
Unpaid house work	2,943	3,743	79,529	86,215	3.4	4.7	8.1
SNIM employee ¹²	3,766	3761	132321	139,848	2.7	2.8	5.5
Civil servant	3,190	6,762	121,994	131,946	2.4	5.5	8.0
Business	3,683	4,657	107,079	115,418	3.2	4.3	7.5
Artisan	4,921	3,932	73,371	82,223	6.0	5.4	11.3
Market gardening	6,232	2,915	98,331	107,478	5.8	3.0	8.8
Retired	3,530	4,797	80,933	89,260	4.0	5.9	9.9
Non-SNIM employee ¹³	4,566	5,472	95,381	105,419	4.3	5.7	10.1

Source: *Consumer Assessment of Reforms to the Provision of Ancillary Services in the Mauritanian Mining Sector*, World Bank, February 2006, p.55.

4.3 The analysis of consumers' willingness to pay shows vastly different attitudes between SNIM Cité residents and the rest of the population in the corridor. Inside the Cité, willingness to pay for improved and generally accessible service delivery is very low since SNIM employees consider free water and electricity provision as their right and an essential part of their benefit package. Any attempt to introduce payments on SNIM staff for water or electricity is therefore likely to result in strong opposition. Especially with regard to electricity, employees do not feel that they should be coerced to pay for improvements in Zouerat as a whole because they do not consider the neighborhoods outside the SNIM Cité to be their concern.

4.4 Outside the Cité there is a strong appreciation for any improvements in water and electricity services and an understanding that these can only be achieved and sustained if everybody contributes. With regard to water, most households are willing to pay at least the national tariffs, and in many cases even more than this, to see an improvement in the current situation (in Zouerat, 88.4% of households would be willing to pay the national tariff, and 44.9% would be willing to double their current payments; in F'Derick, 75% would pay national tariffs and 25% would double payments; in Choum, about 66% are willing to pay national tariffs and 33% would double payments). Concerning electricity services, a large majority of non-SNIM employees (83%) are willing to pay more for improved service delivery, and nearly half of the consumers say that they would be prepared to double their current payments to gain better electricity service. 50% of the households in F'Derick who do not currently pay for electricity would be willing to do so. Poorer consumers outside the Cité with no or limited access to services (and therefore low levels of expenditures on utilities) show the greatest willingness to pay more to achieve improvements in their town's electricity services when compared to

¹² These are people employed by SNIM who do not reside in the SNIM Cité (possibly because they have been recruited locally or have moved out of the Cité for some reason). SNIM Cité residents are not included in this analysis as they are provided with free water and electricity on a quota basis.

¹³ This refers to waged workers employed on a regular basis by individuals or entities other than SNIM.

other income categories, most likely because these households have the least opportunity to obtain a connection (SNIM suspended access to new electricity connections in 2004) but view this as a great chance to enhance their business opportunities. However, significant opposition comes from consumers that currently spend more than 7.5% of total expenditures on electricity, most of whom belong to the lowest income quintile. Members of this group clearly stated that they cannot afford to pay higher prices and would most likely reduce consumption or lose access altogether if tariffs were increased.

SOCIAL GROUPS AND INSTITUTIONS AT RISK

4.5 Improvements in water and electricity services require substantial investments, which will subsequently lead to tariff increases that will have to be passed on to consumers, some of which are particularly vulnerable to changes in the status quo. The Consumer Assessment showed that many of the poorest households spend proportions of their incomes on water and electricity that are considered unsustainable, i.e. above 5%. If tariffs for water and electricity increase, it is likely that they will have to make difficult trade-offs to pay for other essential commodities and services. This poses a risk to their access to adequate nutrition and/or participation in other livelihood dimensions (e.g. health or education). The PSIA identifies social groups that already face difficulties in accessing services and discusses options about how they might be protected (regardless of which reform options will eventually be adopted) in greater detail.

4.6 Small and Medium Enterprises: The majority of all 1,000 SMEs in the Nouadhibou-Zouerat corridor are small-scale, family owned enterprises, a third of which are run by women. At least one in five of these SMEs' depend on electricity for production purposes. Poor electricity supply already constrains the productivity and growth of these enterprises. Willingness to pay for improved supply is very high, although about one quarter of SMEs would experience difficulties in paying more than current levels due to very low incomes (less than 10,000 UM/month or around US \$42). Hence, the future tariff structure would need to take into account the special need for electricity combined with the limited ability of some SMEs to pay higher tariffs.

4.7 Market Gardeners: At least 60 households in Zouerat live off selling home-grown garden produce. These gardeners provide the bulk of fresh vegetables and mint in the city. They are particularly vulnerable as they have very low levels of income and depend on free waste water from the SNIM Cité to irrigate their crops. The use of untreated waste water poses a public health threat and needs to be addressed, but in a manner that protects the gardeners' livelihoods. A feasibility study is required to address this issue in more detail.

4.8 Livestock Producers: Nomadic groups come to Zouerat (and other small settlements supplied by SNIM) to obtain water at different times of the year, notably in the height of summer. The watering of livestock can lead to sharp increases in water consumption in the city and needs to be considered when calculating consumption needs and patterns in light of a forthcoming network expansion. More research is needed to determine the number of nomads and their water consumption to make conclusive

statements about possible mitigating measures. However, it is evident that if the reform agenda does not accommodate nomadic people, they may be placed at serious risk as water sources are rare in the corridor.

4.9 The Poor: Numerically, the most significant vulnerable group is made up of the poor, which are primarily households headed by unemployed persons (625 hhs), those doing unpaid house work (390 hhs); low-income SMEs (150 hhs); artisans (40 hhs); gardeners (60 hhs); and certain pensioners (20 hhs) all of which live on less than 10 000 UM/month (US \$42, which is roughly equivalent to about US \$0.25 per person per day). All in all, these households make up approximately one quarter of the population in the target settlements. Their ability to pay, especially for more expensive water services, is very limited. Moreover, they are at risk of losing access to essential services, which further perpetuates the poverty trap.

4.10 SNIM Employees: SNIM's staff remuneration package includes specific benefits, notably housing with water and electricity included. Employees have joined the company on the basis of this benefit package and expect these conditions to be maintained. If SNIM does not offer its skilled cadre attractive benefits it is likely to find it difficult to recruit and maintain staff in an increasingly competitive sector. However, SNIM could maintain the remuneration packages even if the reforms were implemented by paying an operator on behalf of its staff, as is already the case in Nouadhibou.

4.11 The Municipality: In the case of Zouerat, income from water re-sale (provided for free by SNIM to the Municipality) is the single most important source of revenue for this level of local government. Since all reform options discussed above envisage a single new operator for water distribution, the Municipality would be excluded from the distribution system which would mean a significant revenue loss.

POLICY RESPONSES TO IDENTIFIED RISKS

Five policy options have been identified to mitigate the risks of reform for vulnerable groups. Selected measures will have to be incorporated in the design of any reform implementation plan.

4.12 Stepped tariffs for water and electricity. At present, all households outside the Cité pay similar prices (although their ability to pay varies significantly), resulting in considerable variance in the proportion of income spent on water and electricity. With stepped tariffs higher-income consumers subsidize poorer households by paying above-average prices. This is only feasible if the new operator will be mandated to service the SNIM Cité, the area in the Corridor where most upper-income households reside, along with all other settlements. Additionally, operators will need to devise flexible measures to allow those with irregular incomes to make payments when they are able to do so.

4.13 Spreading connection fees. To encourage and enable low income households to connect to the grid it is vital that the future operator institutes mechanisms that allow for

connection costs to be spread over time so that households can make payments according to their present ability to pay.

4.14 Subsidies for the poor. Even with the connection costs being spread out, the approximately one third of unconnected households which subsidize on less than 10,000 UM per month (US \$42) will still find it difficult to connect. These households will only be able to connect if their connection costs are covered by a third party. This third party could be the operator (through cross-subsidies), SNIM through its Corporate Social Responsibility program, the Government, or donors. The recipients of subsidies should be selected in a transparent manner, possibly involving a non-partisan committee functioning under the Municipality.

4.15 Making access to water easier and cheaper through standpipes. Providing universal access to water in the Nouadhibou-Zouerat corridor through a piped network will be difficult to undertake, expensive, and will only be achievable in the longer term. The existing role of the Municipality as operator of tanker trucks that sell water (provided by SNIM for free) to households outside the Cité is very problematic as this service is costly, inefficient, inequitable and possibly corrupt. A cost effective alternative could be the installation of a piped network to community managed standpipes.

SNIM has expressed concerns that a piped network outside the Cité will result in high levels of consumption, placing the remaining reserves of sweet water at risk. However, a number of key informants working for SNIM and the Municipality who were interviewed in the process of the PSIA disagreed with this assertion. They believe that water could be efficiently delivered through a piped network to community managed standpipes at specific times of the day and in limited amounts, preventing excessive use and steep increases in consumption. They argue that this would result in (a) greater transparency of operations; (b) greater equity in terms of geographic distribution, and (c) reduced costs.

4.16 Waste water for market gardeners. Market gardeners are amongst the poorest households in the corridor and the economic viability of their businesses depends on access to free waste water for irrigation. The reform should safeguard their long-standing access to water, but at the same time try to address the public health threats associated with the use of untreated waste water for irrigation.

4.17 Finding a new role for the Municipality. The Municipalities could become part of the new service delivery systems. Water and electricity service provision are essential public responsibilities in which the Municipality must play a role, at least in supervising operators and mediating between the interests of the different entities (SNIM and the utility distributor) and citizens. A small percentage of the revenue from water sales could go to the Municipality for its participation. Feasibility studies are needed to provide detailed information on the potential shape and form of the Municipality's involvement.

There is a pressing need for reform with regard to tanker truck operation by the Municipality. This method of delivery is economically inefficient and results in social injustice as consumers are heavily penalized by having to pay more than is necessary. The costs

of tanker delivery can vary between 2,500 UM (\$10.46) and 10,000 UM (\$41.84) per 8m³, depending on the distance to be covered between the source and delivery point. In contrast, the same amount of water could be delivered to households through a piped network for as little as 748 UM (\$3.13).¹⁴ Moreover, from a public health point of view, tanker delivery results in a decrease in water quality, posing possible health risks to consumers.

A piped network would not necessarily imply ending all tanker truck operations. Indeed, better-off households with large cisterns will probably wish to continue to be supplied in this way. Hence, a small number of private sector tanker trucks, functioning in parallel to the public standpipe system, could satisfy this demand.

Table 7: Summary of benefits and risks of reform to certain stakeholders; policy options for mitigating identified risks

Stakeholders	Benefits	Risks	Options to mitigate risks
SNIM	Saving valuable resources for new investments; protecting SNIM's competitiveness	If capacity of implementing agencies is limited, SNIM's competitiveness is at risk	Assess the implementing agencies' capacity for service operation and transfer services carefully. Consider a gradual transition to build capacity of the new provider over time. Clearly define expectations about required standards and define indicators to monitor them after transfer. Develop "fall back" or "safety" rules with new provider.
Government	Lower inequality in service provision reduces risk of social tension and unrest in the corridor and increases government credibility and acceptance (compliance with new legal frameworks)	A decline in SNIM's competitiveness translates into a loss of revenues for the Government.	ditto
Implementing agencies	Compliance with national legislation.	If SNIM Cité is not included in the service mandate, utility service operation will not be able to operate in an economically viable manner and will have to rely on government or SNIM provided subsidies.	If negotiable, make the inclusion of the Cité in the service mandate a precondition for service transfer.

¹⁴ *Consumer Assessment*, p.85.

Stakeholders	Benefits	Risks	Options to mitigate risks
Small and medium enterprises	Better access to water and electricity will increase the productivity of SME as they depend on water and especially on electricity for income generating.	Approx. 25% of SMEs in the corridor will not be able to pay more than current tariffs.	Consider applying base-line consumption or stepped tariffs and flexible repayments of connection fees to allow smaller SMEs access to services.
Market gardeners	Improved access to, and better quality of, water will improve their produce and subsequently their livelihoods. It will increase the supply of fresh vegetables for residents in the corridor with expected nutritional improvements.	Market gardeners rely on untreated wastewater from the SNIM Cité for irrigation, which poses a public health risk. However, depriving them of access to wastewater will threaten their livelihoods.	Access to land for gardening and use of waste water for irrigation needs to be secured to sustain this income generation activity. Cité wastewater should at least be pre-treated to eliminate public health threats. The development of possible solutions and support from SNIM is required to address this issue in more detail.
Livestock producers / nomadic groups	Improved access to water will enhance health of livestock herds and stabilize nomads' livelihoods.	It is unclear how much water is consumed by this group, especially in the summer when demand is greatest.	Understanding the specific water needs of this group requires further research. However, their consumption and provision needs must be considered as it is substantial in the summer months and can otherwise lead to miscalculations of required water capacity, particularly in Zouerat.
The poor	The poor account for 25% of the population in the target settlements. A pro-poor reform would attempt to expand access to water and electricity for this group.	Their ability to pay, especially for more expensive water services, is very limited.	Integrate policy measures outlined in chapter 4.4. into reform design..

Source: PSIA generated data.

4.18 Weighing risks against benefits, the overall conclusion of the poverty and social impact analysis is that the positive effects of reform will outweigh its potential risks. The overall assessment of institutional capacity, gains and risks from a social and economic perspective reveals that a transfer of water and electricity services to a new operator would benefit most stakeholders, enhance legal regulation and oversight, reduce social inequalities and provide better business opportunities for SNIM as well as for small businesses operating in the city of Zouerat. However several groups are at risk of potentially losing out and will need to be protected by implementing mitigating measures as outlined above. There are also institutional risks that need to be carefully managed to ensure a positive outcome of a service transfer. Attention to institutional capacity building is key, as well as a gradual transfer of responsibilities to the new operator.

Without the continued drain on its fiscal resources, **SNIM**'s competitiveness will be strengthened and the company will be able to make new investments in its core mining business again. By transferring water and electricity distribution to a third party, SNIM could free itself of the burden of being a 'social' service provider, a task that has increasingly overwhelmed the company. This reform would also bring SNIM in line with national legislation that mandates other agencies to provide utility services in the corridor. The **implementing agencies** will then begin to play a significant role in the Corridor as envisaged by national policies and legislation. The **Municipalities** could become part of the new service delivery systems. Water and electricity service provision are essential public responsibilities in which the Municipality must play a role, at least in supervising operators and mediating between the interests of the different entities (SNIM and the utility distributor) and the citizens. Most importantly, the **consumers** will find that they are able to access water and electricity services that are safe and reliable at prices that most can afford.

4.19 At the same time, the costs of maintaining the status quo will be large, if not prohibitive. Inequality in service provision will increase while reliability and quality of service provision will further decrease as resources become scarcer. This is likely to affect the social integration and cohesion of the communities in the corridor, possibly triggering social unrest and opposition against SNIM.

5. Political Economy Issues of Reform Implementation

5.1 Despite assessments confirming the technical, social and economic viability of the reform proposal, previous attempts to move the reform process forward have failed. Indeed, the provision of analytical evidence and the subsequent development of transfer options seemed insufficient in addressing stakeholder's concerns. A detailed analysis of stakeholder's interests and their support for and opposition against the reform proposal reveals insights into why this has been the case and provides potential strategies for overcoming these constraints.

OVERVIEW OVER THE POSITIONS OF KEY GOVERNMENTAL ACTORS

5.2 The Government clearly favors the implementation of the reform, but is reluctant to put pressure on SNIM. The Ministry of Economic Development, the Ministry of Energy and Oil, and the Ministry of Water Affairs have repeatedly expressed their concerns about the growing inequality in utility service provision and emphasized their willingness to move forward on the utility sector reform agenda. However, to date the Government has neither taken any decisive steps to initiate the transfer of utility service provision from SNIM, nor has it selected a new provider. This is most likely due to the Government acknowledgement of SNIM's doubts about potential new providers' capacity and concerns about undermining SNIM's efficiency and mining productivity, which would have direct implications on government revenues.

5.3 The regulatory organizations of the state are theoretically well placed to promote the transfer of services through licensing and other legal instruments. The key agency in this category is the **Multisectoral Regulatory Authority (MRA)**. By law, the MRA should ensure that all agencies engaged in the provision of utility services comply with the national legislation outlined earlier in this report. In reality, the MRA has done little to promote the reforms as it has neither asked SNIM to become a licensed operator nor taken decisive steps to protect consumers in the NZC.

5.4 **Development coordination ministries**, notably the Ministry of Economic Affairs and Development (MEAD) are in a position to encourage discussion between the key parties and ensure that reform momentum is maintained. The MEAD is well-placed to influence the reform process and has clearly indicated a desire to see greater equity in service provision in the NZC, regardless of employment status or area of residence. The MEAD has the potential to drive the process and has recently demonstrated both its willingness and capacity to do so by promoting and facilitating dialogue between stakeholders and establishing committees dedicated to the reform process.

5.5 **Sectoral Ministries**, notably the ministries of Mining; of Energy and Oil; and of Water, could encourage (or even oblige) the entities under their control to take concrete steps towards the transfer of services. The **Ministry of Energy and Oil** could insist that SNIM transfers aspects of power supply and/or distribution to SOMELEC or another entity. However, to date it has not actively supported the reform process. Not only does

it have concerns regarding SOMELEC's management and technical capacity but it is also hesitant to take any action that might undermine SNIM's efficiency and mining productivity. In short, it has done little to challenge the powerful position of SNIM or to enhance the position of SOMELEC. In short, the Ministry could play a very critical role in promoting the transfer of electricity distribution to a new entity, but has so far not come forward to do so. Similarly, the **Ministry of Water Affairs** could have encouraged SNIM to hand over water distribution to SNDE (or another entity) but has not done so. Its future involvement may be essential if a successful transfer of water distribution is to take place in Zouerat. However, in the absence of verifiable information on potable water sources in the Zouerat area, it may be reluctant to place any pressure on SNIM to relinquish control of distribution, let alone production of this strategic resource. Support from the PRISM project to finance new water drillings and secure new water sources is essential to overcome this bottleneck and to provide new negotiation options. The **Ministry of Mines and Industry**, being SNIM's line ministry, is best placed to take an active role in encouraging SNIM to focus on its core business of mining and to be less directly involved in the provision of ancillary services. However, the Ministry has not had any measurable impact on the proposed transfer of ancillary services to date. As noted earlier, SNIM tends to operate in a largely autonomous manner, with the influence of the Ministry being barely discernible.

THE POSITION OF SNIM

5.6 SNIM welcomes the opportunity to reduce its non-mining costs through the reform but is also strongly reluctant to give up control over the power and water supply for its industrial operations and employees. The mining company would like to rid itself of the burden of having to supply water and electricity to consumers outside the SNIM Cité. The company also acknowledges its own inability to provide adequate water and electricity services to these households. Hence, the company favors a reform design which implies ceding all its utility service operations outside the SNIM Cité while maintaining control over production and distribution within the Cité. Since SNIM attracts its staff, especially the higher qualified tiers of its workforce, through benefit packages including housing with free water and electricity, the company is very reluctant to take any steps that would jeopardize the high levels of service provision in the Cité. The company also does not believe that nationally-mandated service providers (such as SOMELEC and SNDE, see below) have the capacity to manage the production and distribution of water or electricity with the degree of reliability necessary for mining production and employee satisfaction. Previous attempt to discuss details of transferring services to a new provider have failed because of these concerns.

IMPLEMENTING AGENCIES AND THE MUNICIPALITY

5.7 The implementing agencies that could potentially take over utility service provision from SNIM are largely in favor of the reform. However, following economic rationale, they are not willing to take over operations in Zouerat without also

being responsible for the utility service provision in the SNIM Cité. All upper-income households with the greatest ability to pay live concentrated in the Cité, and utility service provision is unlikely to be economically viable without revenue generation from serving this clientele.

5.8 The Municipality of Zouerat is reluctant to reform due to concerns about revenue loss. Excluding the Municipality from the water distribution system would not only mean losing income from the onward sale of free water, but would also be against the provisions of the new Water Act of 2005 which mandates that local authorities should be actively involved in the provision of water services, at least by planning future investments. Local government capacity needs to be built up and strengthened if SNIM is to reduce its functions as a utility provider.

POTENTIAL OPPOSITION TO A TRANSFER OF UTILITY SERVICES TO A NEW OPERATOR

5.9 The Consumer Assessment highlighted a number of sources of potential opposition. The acceptance of the reform among the most influential consumers – SNIM employees – rests on payments for water and electricity being made by SNIM on behalf of its staff. If this is well-managed and SNIM agrees to pay an operator for the consumption of its staff, then the risk of social opposition from SNIM employees is low. However, if SNIM decides to pass some of these costs on to its employees through direct or indirect payments, there is a strong possibility that the company will face intense opposition, presumably through the unions.

5.10 As shown in the Consumer Assessment, opposition could also stem from those approximately 25% of consumers who would not be able to pay more for electricity services than they currently do. There is a strong possibility of poor consumers opposing new tariff structures unless stepped tariffs are introduced to protect this customer group. At the same time, the economic assessment showed that increases would be necessary to achieve operator viability – an essential factor to attain sustainable reform outcomes.

5.11 In F'Derick, about half the consumers have accepted that they will need to start paying for electricity. However, the remainder is likely to oppose any measures that will see an end to their free access to electric power. Unless the transition from free power to paid power is handled very effectively (through good external communication and a stepwise transition) there is a strong possibility of social opposition from at least half of F'Derick's residents.

5.12 In Choum, the picture is quite different since the risk of opposition comes from any further delays in implementing the reform. The community feels sidelined and neglected, especially with regard to electricity service provision.

ADDRESSING POLITICAL ECONOMY CONSTRAINTS

5.13 These diverse and partially competing interests, the interdependence of required action steps (one component needs to be in place first in order to be able to agree on another component), and the uneven bargaining power among stakeholders **led to a logjam in the process**. A series of intense stakeholder consultations was seen as a promising instrument for overcoming the standstill and fostering a consensus on how to move forward.

5.14 A cascade of consultations was initiated, starting with individual discussions with each stakeholder. Positions were inquired and issues, options and possible solutions discussed. Subsequently, stakeholder groups representing a similar position were clustered and invited for discussions. Stakeholders then presented their opposing positions, and a common way forward was identified through negotiations. **After a period of 18 months, stakeholders agreed to meet in a workshop to discuss *how* a transfer could be facilitated.**

6. The Way Forward for Implementing the Necessary Reforms

6.1 A stakeholder workshop was held in Nouadhibou in January 2007 with the objectives of discussing how the above concerns could be addressed and to identify if there was enough support, including from opponents, to move into the planning phase for utility service transfer. The willingness for reform was confirmed by all parties and participants agreed on a preferred transfer option. A technical steering committee, comprised of government, municipality, SNIM, provider and consumer representatives, was assigned to propose solutions to outstanding issues and to develop a road map for the transition process. A political decision making committee endorsed the road map. The results of the PSIA were presented to make stakeholders aware of potential social and economic risks and to inform them about consumer's willingness and ability to pay. **Participants agreed upon functional solutions for incorporating poverty and social aspects in the new arrangement.** The results discussed below are presented by locality.

6.2 The suggested solution for Zouerat is to have one single operator in charge of the distribution of water and electricity for the whole community, but excluding industrial mining facilities. This operator should be entrusted with the distribution of water and electricity services both in the SNIM Cité and in the remainder of the city. The new operator will have to offer services adapted to the demand of its customers and their ability to pay. In particular, this means that the modalities and technical details of the electricity and water distribution system can be differentiated by neighborhood. The operator should be supplied with water and electricity from bulk producers which should be selected by public tender under the supervision of the Multisectoral Regulatory Authority (ARM).

6.3 As a first step, establishing a water distribution network in the peripheral quarters of Zouerat will require providing water access to the population via stand-pipes. In the second phase, and depending on the availability of water resources, individual household connections should be offered to the population.

6.4 The new single operator for Zouerat should be selected by public tender, overseen by the Multisectoral Regulatory Authority (ARM). The government invites SNIM, SOMELEC and SNDE to form a consortium to take part in the tendering process. The new operator should be established as a private enterprise and prepared for private sector participation in its capital stock. This solution would allow SNIM to retain control over the quality of services provided by the new operator during the first phase, while preparing its own financial pullout from the enterprise. It would also allow SOMELEC and SNDE to be present in the project and would allow the new enterprise to draw on the technical expertise of all three entities (SNIM, SOMELEC and SNDE).

6.5 The composition of the new operator's capital stock could be organized as follows:

- Initially, 50% of the capital are held by SNIM and 25% held by each SOMELEC and SNDE.
- SNIM can eventually reduce its capital share to a symbolic value (below 20%) or even pull out completely; this pullout will be organized as cessation of business and ARM will have to define the conditions of this cessation.
- The participation of SOMELEC and SNDE should evolve in line with the technical requirements and the level of private sector engagement in the new operator.

6.6 Electricity distribution in F'Derick should remain with the same operator that will be in charge of electricity distribution in Zouerat, because of their proximity (30km distance between Zouerat and F'Derick) and for the sake of efficient use of resources. Therefore, the setup of the new operator in Zouerat will need to include provisions for F'Derick, especially the necessary transition from a system of free service delivery to a regime of charging the effective consumption costs.

6.7 The present situation regarding water services in F'Derick is satisfactory with a private operator selected by ANEPA. However, this situation could be improved by licensing an operator selected through public tender under the control of ARM. In any case, it is advisable to codify the service conditions of the operator by setting up a contract that ensures electricity supply by SNIM in return for SNIM to procure water from F'Derick.

6.8 The suggested solution for Choum is the application of national policies to the settlements located in this area, i.e. establishing local operators according to the solutions developed by ANEPA and ADER. However, two issues remain to be resolved: First, the Government must decide which agency has to finance the investment costs of the electrification project. ADER and APAUS have both analyzed and prepared the same electrification project, adhering to the national electrification policy. There is no other feasible solution than the state deciding on which agency will be in charge of the financing.

6.9 Safeguarding sustainable water supply will depend on the discovery of new sources of potable water. An exploration mission searching for potable water is currently being undertaken in the area between Choum and Zouerat with financial and technical support from the PRISM project. Given the importance of new water resources in achieving positive and sustainable reform outcomes, PRISM's support in this activity should be augmented.

6.10 The success of establishing a local operator for water and electricity services largely depends on investments in the distribution network. It is therefore required for SNIM or other potential new operators to negotiate the financing of required investments with government and possibly with donor agencies in order to:

- improve the water and electricity networks in the SNIM Cité;
- completely refurbish the electricity network in Zouerat (outside the SNIM Cité);

- establish a water distribution network in the peripheral quarters of Zouerat, securing an initial basic water service provision system through standpipes.
- renovate and secure the electricity network in F'Derick.

The implementation process should thus gauge the necessary investments and plan for the corresponding financing.

6.11 To secure access to water and electricity services for identified vulnerable groups, the PSIA policy recommendation outlined in chapter 4 should be adopted under any transfer scenario. SNIM confirmed its commitment to being a socially responsible enterprise and expressed its interest in supporting measures that allow protect poor people's access to essential services.

6.12 To implement the solution outlined above, the following next steps should be taken:

- Undertake a public tendering process, based on the requirements specification developed by ARM, for the production and supply of bulk electricity to the future operator in Zouerat. SNIM shall take part in this tender and if it is the lowest bidder – which is likely considering its present energy production facilities – obtain the status of an Independent Power Producer (Producteur Indépendant d'Énergie, PIE). The requirements specification and the contract will have to define the technical and financial conditions of the electricity provision.
- Hold a public tendering process, based on the requirements specification developed by ARM, for the production and supply of bulk water in Zouerat.
- Public tender(s) are needed for the selection of the electricity operator for Zouerat and F'Derick, and for the selection of the operator of water services for Zouerat. Both licenses (distribution of water, distribution of electricity) should be assigned in the same tendering process.¹⁵
- The Government should set tariffs, based on the suggestions from ARM, for the distribution of electricity (Zouerat, F'Derick) and water (Zouerat).

ADDITIONAL WORK TO BE UNDERTAKEN

6.13 A considerable amount of work will be required before tender documents for the actual operations can be prepared. The need for such groundwork has previously been recognized in the ETASCO study. It was emphasized in the document that, for progress to be made, it would be necessary to investigate a number of issues in greater depth to determine the operational costs of implementing the preferred options. Areas of work include:

¹⁵ In fact, in case two separate tenders will be held, there is a risk that one of the two tenders will be unsuccessful, in which case the outcome would be a one-sided result, having an operator for one service but not for the other. It would thus be more effective to initiate only one public tender under the control of ARM for both services; if this should not be possible it would be appropriate to launch the two tenders simultaneously so that the decisions about assigning the two licenses could also be made simultaneously.

- Study of potential water sources and of optimizing their use
- Audit of the existing reticulated water network
- Audit of the existing electricity network
- Audit of the sewerage network
- Study on the potential future involvement of the Municipality

6.14 The newly-formed steering committees will have to decide how best to proceed with these studies. Each of the above studies (or similar) could be put out for tender, but this could be a fairly costly and administratively cumbersome process. Another possibility would be to incorporate the audits, feasibility and detailed design studies into the main contract for the operation of the new networks. In other words, those tendering for the long-term operations would need to indicate what preliminary work they would undertake (and at what cost) to upgrade and extend the existing systems to the point that they can be operated successfully. The contracts could be structured in a phased manner so that critical milestones have to be achieved before the contractor could move on to the next phase.

Annex: Methodology

METHODOLOGY OF THE CONSUMER ASSESSMENT

The Consumer Assessment was chosen as one of two methods for this PSIA as it generates information on people's consumption patterns, their preferences and their willingness and ability to pay for services under varying circumstances. This information helps to determine the degree of vulnerability of people to changes in access to essential services and to identify who is at risk if tariffs are increased – both core objectives of this PSIA. It also highlights situations where better-off consumers are under-charged for services they would be willing and able to pay more for and hence identifies options for potential redistribution of costs and enhanced access to services for presently excluded citizens.

Additionally, the Consumer Assessment also reviewed the viability of future service delivery option. Information generated on consumption patterns allowed a first basic estimation on demand and supply of future service delivery. This is essential information if future systems are to be properly designed. For example, if demand is overestimated, valuable resources may be wasted on the construction or upgrading of systems that are not fully utilised. Similarly, if demand is underestimated many consumers may be inadequately supplied even though some improvements are made in service provision.

In exploring what consumers would be willing to pay for services, the Consumer Assessment took into consideration how attitudes are shaped by existing circumstances and discusses how reforms may change these. In situations where services have been obtained for many years without payment (or with subsidies) this entails exploring the conditions under which consumers would be prepared to pay more. The assumption here was that consumers are willing to increase payments, but only in exchange for an improvement in services, with the focus being on greater reliability, improved access and improved quality and quantity. In the arid Saharan region where SNIM operates this presents technical challenges and it may be very difficult to offer such improvements in the short term at a reasonable price. For this reason the social and technical dimensions of the reform have been addressed concurrently, with strong collaboration between the social and economic research teams.

Willingness to pay can also be influenced by people's perceptions of the service provider. The assumption in this case was that if there are already problems in current supply it may be difficult to convince consumers to pay (or to pay more) as they may be sceptical about the success of reforms if implemented by the current provider. For this reason, the Consumer Assessment gave consideration to the views of consumers regarding the institutional arrangements that are put in place by the reforms and weighs these against proposals being made by other stakeholders, including the current service providers. In this way the PSIA facilitated agreements on the best institutional arrangements, taking producers' and consumers' views into consideration.

The Consumer Assessment also looked at what people are actually able to pay, as this can differ from what they are willing to pay. This entailed collecting a wide range of socio-economic data at the household level, which was compiled via the Tenmiya study. The data was then be used to analyze how tariff structures needed to be designed in order to make service provision affordable and economically viable. It also showed what proportion of the population is destitute and unable to pay for services. This information provided a basis for discussions with stakeholders regarding how to provide services for the poor. Combined with the information on consumption and willingness to pay, the ability to pay analysis provided an indication of the return that can be expected from new investments in infrastructure.

Research design

The Consumer Assessment which was applied is based on a comprehensive household survey (covering different social groups in terms of class, gender, residence, etc) and a contextual analysis of identified issues, based on qualitative research methods.

Research was conducted in the three largest settlements in the corridor (outside of Nouadhibou), namely on the towns of Zouerat, F'Derick and Choum. The qualitative study laid the foundation for a quantitative survey by exploring issues in an open-ended manner. This guided the development of the household questionnaire. The quantitative survey, in addition to gathering new information, helped to test to which degree the phenomena and issues identified by the qualitative study could be generalized. A brief summary of the qualitative and quantitative methods is given below.

Qualitative methods

The qualitative research was based on observation, key informants and focus groups interviews, and case study write-ups. Particular objectives included: identifying and describing profiles of those social groups and institutions using water and electricity services and likely to be impacted by the reform; analysing stakeholders' interests and influence at the community level over reform proposals and; assessing the institutional capacity of potential future service providers. A team of six researchers, managed by an anthropologist, engaged community leaders, administrative officials, entrepreneurs, women's cooperative members, consumer groups and SNIM staff in the discussions. Specific cases at the consumer and institutional level with regard to consumption patterns and practices were investigated in more depth, providing an opportunity for the 'triangulation' of data collected from different sources and through different methods. Information obtained pointed to local political economy issues in water and electricity supply and distribution.

Quantitative methods

The quantitative research used a household survey to examine how different social groups might be impacted by the various reform options. The questionnaire was drawn up by a team of local and international consultants and shared with local stakeholders for their comments before being pre-tested and finalized. It contained over 300 variables, covering the basic demographic and socio-economic characteristics of the households, followed by detailed information on water and electricity consumption, views of service delivery and willingness and ability to pay for these. The high level of homogeneity

within neighborhoods allowed for a more limited sample size (440 households) than would otherwise have been the case. The sample captures households living within the SNIM residential areas as well as those outside. Data collection took place over a two week period in the middle of summer (1-15 August 2006) when water and electricity use are at their highest. Levels of community cooperation were high, with only two households declining to participate.

Limitations of the data analysis

Wherever possible, the distributional impacts of reform were explored by disaggregating the data according to the areas of residence (SNIM Cité vs. non-SNIM residences). Data were weighted to reflect actual population sizes of the sampled areas.

One constraint of the data analysis was that SNIM employees are provided with free unmetered water (delivered through a piped network three times a day), making it impossible to determine the quantities used. Likewise, SNIM households operate under a quota system for electricity and are often unaware of how much they consume. As a result, consumption data for SNIM employees is based on estimates and less accurate. This constrained comparing SNIM and non-SNIM households on the same basis.

In analyzing the likely distributional impacts of a reform, a PSIA often explores how these might vary according to variables such as consumers' age, education status, class, gender, ethnicity, religion or political affiliation. While all of these are important in Mauritania, the data analysis in this study has concentrated on two key variables: employment status and levels of income. The reason for this is that these two variables are of particular importance in the Nouadhibou-Zouerat corridor: the social status of a household is largely determined by the occupational status of the household head and his income level, especially with regard to accessing the utility services that are the subject of this report. In situations where other variables, such as gender, appear to be important these are noted and brought to the fore. However, by and large, the data are stratified according to occupation and income.

METHODOLOGY OF THE ECONOMIC ASSESSMENT

The Economic Assessment analyzes the viability of different transfer options from an economic point of view. It was designed to inform the Consumer Assessment by providing an indication of the tariff structures that would be required to make service provision financially viable under different reform options as well as to provide information to be discussed at the PSIA stakeholder workshop. For these reasons it has been closely studied and extensively used in this report, which effectively synthesizes the results from the qualitative and quantitative field surveys with those of the economic study.

The economic analysis tested different quantitative models of operating water and utility services in Zouerat, F'Derick and Choum, based on data on present consumption patterns, investment costs, amortization, capacity utilization and cost recovery. The models tested different tariff structures and showed what prices would need to be charged if

service operation was to be profitable in the medium to long term. Results of this analysis are presented in table 4 of this report.

If the Consumer Assessment shows that consumers' ability to pay falls far below the resources required over time to maintain (and eventually replace) the infrastructure, consideration has then to be given to the institutional and financial measures that will be required to maintain the viability of the service providers. For example, this could be in the form of cross-subsidies from other operations or it could be a direct subsidy made by the Government. Either way, the mechanism should be transparent and adequate to maintain the viability of the service providers.