

STRATEGIC PLAN FOR THE ENERGY MANAGEMENT IN SONEDE

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SONEDE mission is to supply drinking water to all the Tunisian territory, she worked for decades for the development, operation, maintenance and renewal of a complex water infrastructure covering the entire countries with a combined length of 50000 km of water pipelines and with 1300 pumping stations and 1000 tanks which achieved a coverage rate of 100% in urban and 94% rural areas. Production transfer and distribution of water, through this important infrastructure, require large amounts of energy, which puts SONEDE as one of the largest energy consumers in Tunisia. Indeed, consumption reached in 2013, 360 GWh equivalent to 26 million €, which represents 20% of turnover of the company.

Aware of the challenges of energy costs in its financial balance, SONEDE conducted since 1998 several actions to control energy costs throughout its pumping stations essentially through the judicious choice of electricity supply contracts, the optimization of the pumping on the basis of the pricing schedule electricity, improving the power factor, improved maintenance programs, enhancing technical diagnostics operations and training of its staff Operating on energy management techniques.

These actions have achieved substantial results essentially by:

- maintaining the cost of electricity in SONEDE to a value lower than other customers of STEG as shown in Figure No.5.
- reducing the cost of electricity at SONEDE, calculated on the basis of the same price to eliminate the influence of increases in electricity prices from 1998 to 2014, as shown in FIG No. 6.

Although this actions have reduced energy costs, they remain relatively high compared to the turnover of SONEDE. This is explained in part by the low rate of increase in the water tariff compared to that of electricity. In addition, and prior to 2004, there were constraints to promote energy conservation programs, particularly the establishment of larger projects:

- The regulatory framework of incentives to the actions of energy control was not mature enough,
- Lack of national expertise in the field of energy control at the level of the drinking water sector that may give an additional contribution to the existing program of SONEDE,
- International cooperation and partnership program were underdeveloped,
- The difficulty in finding funding for such projects for uncertain economic viability reasons,
- The non-availability of mature and low costs technology to improve energy efficiencies in the drinking water sector,
- The energy prices were relatively low and do not promote the development of such projects.

In addition to the previous review, future projections of changes in costs of energy are worrying, given the rapid and sustained increase in energy prices, and given the trend of increasing energy consumption, following the growth of economic activity and population, and the obligation to improve the coverage rate of drinking water (in rural areas) require the extension of the pumping and distribution network and connecting inaccessible areas.

Furthermore, and like the countries of the southern Mediterranean, renewable water resources per capita in Tunisia are marked by a downward trend (the hydraulic potential is 450m³ / capita / year currently, which will be reduced to 360m³ / capita / year in 2030). This situation is exacerbated by the effects of global warming. In order to maintain the balance between supply and demand for water in the future, SONEDE will be obliged, in addition to its water conservation program, to resort to very energy-intensive solutions, consisting mainly of mobilizing all available resources, strengthening water capacity-transfers over long distances, and the use of large-scale unconventional resources such as desalination of brackish and sea waters.

Faced with this situation and prospects inducing significant energy consumption and energy prices persistently high and volatile, SONEDE has implemented an energy strategy in the areas of energy efficiency, renewable energy and energy management, which aims to:

- Participate effectively in the national plan for energy efficiency,
- Compress expenditures as part of the financial balance of the company to ensure the best product at the best price citizen,
- Contribute to the control in the medium term, the cost of operating the water by the diversification of energy resources and the use of renewable energy,
- Acquire an environmentally conscious company image.

To achieve these objectives, SONEDE has developed an energy management plan for the period 2012-2030 to:

- Limit the specific consumption (Wh / m³) to 85% of its expected value in a normal evolution scenario for 2030,
- Integrate renewable energy up to 30% of the total energy consumption in 2030 (objective of the Tunisian government)
- Optimize the pumping of water on the basis of the pricing schedule electricity, with a goal to reduce the purchase price of electricity by 10% by 2018 (based on constant price of the year 2012),
- Reduce fuel consumption by 20% by 2016,
- Establish by 2017 an energy management system in accordance with ISO 50001.

In addition SONEDE will engage several accompanying actions and capacity building which contribute in the implementation of the plan of controlling energy, particularly through:

- establishment of a business plan and organizational audit. This plan is currently underway and is funded by the European Union.
- the introduction of a geographic information system (GIS), financed by AFD, which is about to be set up
- the introduction of a software for better management of human resources, which is currently operating
- total review of commercial information system (CIS) for better control customer management (under establishment) and funded by the World Bank
- achieving future studies concerning:
 - optimizing of the treatment processes for drinking water,

- improving water network performance,
- improving the water micro counting,
- the introduction of a new water-saving plan.

CONCLUSION

Faced with future challenges, SONEDE is determined to achieve significant energy efficiency projects and use renewable energy on a large scale. These are strategic opportunities to SONEDE that will limit the impact of energy costs on the cost price of water in the future. However, their implementation:

- requires research of substantial funding (200 million€), including the use of the opportunities offered by the Clean Development Mechanism,
- and raises challenges in terms of projects, technologies and operations.

To make this energy transition, It is necessary to:

- Start a fruitful framework between SONEDE and authorities responsible of energy sector
- Implementing a network of cooperation, assistance and exchange of experiences and information with all foreign partners.

Beyond the satisfaction of the future needs, this ambitious plan will allow SONEDE to contribute strongly in the national energy control program and in the areas of sustainable development.