Expected benefits adherence to the free energy market: Migration of SAMAE JS to Free energy contracting environment

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Highlights:

- Reduction and reduction of electricity costs
- Public administrative modernisation

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INTRODUCTION

According to SNISi, electricity is one of the top three costs incurred by sanitising companies in Brazil. The intensity of this cost depends fundamentally on topographical issues and the technology options adopted (Borges, 2022). The municipality of Jaraguá do Sul, situated in the north of the state of Santa Catarina, boasts an exemplary human development index (HDI) of 0.803. The Autonomous Municipal Water and Sewage Service (SAMAE-JS) is responsible for the provision of excellent sanitation services. Indeed, electricity constituted 12.30 per cent of costs, representing the second-largest expenditure category after human resources.

For every five gigawatt-hours (GWh) consumed, the Brazilian market has three GWh in the regulated contracting environment (ACR) and two GWh in the free contracting environment (ACL). The latter is on the rise, to the detriment of the ACR (ANEEL, 2023).

In light of the aforementioned considerations, SAMAE-JS constituted a task force (Hackman & Oldham, 1980), (Toffler, 1980), with the objective of implementing a strategic decision to migrate to the free trade environment. This was initiated in October 2022, the formalisation of the interruption of the generation with the local distributor starting in March 2023, and the first change of supplier occurring in February 2024.

The following article will address the following aspects: The anticipated benefits and initial tangible outcomes; the implementation strategy; and the challenges to be overcome.

METHODOLOGY

In the realm of financial management for sanitation companies, distinguishing between cash outflows related to operational expenses and capital investments remains paramount for optimizing resource allocation (Cui, 2022; Ferguson, 1998). One of the primary financial burdens for such entities is the expenditure on electricity, often ranking as one of the two largest financial commitments. In this context, energy expenditures constitute approximately 12.3 percent of total costs. Therefore, optimizing energy use and reducing related expenses can lead to a potential cost reduction of about 3.5 percent, signifying substantial economic benefits.

The organizational shift toward a task force model represents a paradigm deviation from traditional hierarchical structures initially outlined by Fayol (1949). These traditional structures often impede the proactive resolution of multi-faceted challenges that cut across various domains of expertise. As organizations face complex adaptive systems, a systemic and dynamic strategy becomes essential (Senge, 1990). In response, the CEO appointed the technical director and economic analyst to lead a multidisciplinary task force aimed at achieving both economic efficiencies and ensuring energy and operational security. Additionally, collaborating departments such as legal and tendering were engaged to uphold necessary legal frameworks, illustrating the integrated approach suggested by Mintzberg (1980) for overcoming organizational silos.

Recent studies emphasize the strategic role of energy efficiency in organizational competitiveness. Kaplan and Norton (2020) highlight how businesses can integrate sustainability practices into their Balanced Scorecard framework to achieve long-term financial success and sustainability. By aligning energy-saving initiatives with corporate strategy, organizations like sanitation companies can create value not only economically but also environmentally, reinforcing their competitive position.

Furthermore, in the context of technological integration, Jones et al. (2019) explore the impact of smart grid technologies on optimizing energy consumption. These technologies enhance real-time energy monitoring and data analytics, enabling companies to make informed decisions that reduce energy costs. Similarly, Geels (2018) discusses the multi-level perspective on energy transitions, suggesting that companies adopt a holistic view of socio-technical changes to effectively implement innovations that drive energy savings. By aligning technological advancements with organizational goals, companies can achieve significant gains while ensuring compliance with modern energy regulations and sustainability standards.

An integrative approach to project evaluation involving both risk analysis and SWOT (strengths, weaknesses, opportunities, and threats) assessments provides a robust framework for strategic decision-making (Aven, 2008; Gürel, 2017). This method not only uncovers potential threats and vulnerabilities but also highlights opportunities and advantages, facilitating a comprehensive understanding of the internal and external environments.

The legal context surrounding the tendering process, which adheres to pertinent federal and local regulations, is crucial and available through relevant legal resources. The project was operationalized in October 2022, highlighted by site visits to selected energy companies and consultations with industry experts. To objectively assess the energy trading environment, an external consultancy—ensuring neutrality by maintaining no affiliations with energy generation or distribution sectors—was engaged. This consultancy is tasked with identifying potential economic gains and risks as well as outlining strategic action plans, mitigating any potential conflicts of interest.

Strategically, a decision was made to commence the transition of nine out of ten high-voltage consumer units (UCs), responsible for roughly 70% of power consumption, under a five-year energy generation contract. Meanwhile, low-voltage consumer units, which represent a smaller consumption share with lesser potential gains (estimated at 15%), will undergo migration through asset leasing strategies, specifically distributed generation. The ongoing tendering process for this transition is designed to be less bureaucratic, optimizing procedural efficiency.

RESULTS AND CONCLUSIONS

It was decided that energy generation contracts should be reported to the local distributor from March 23 (Legal requirements requiring at least 180 days prior notice). This was to coincide with the preliminary analysis of the environment and the basic roadmap of actions already having been defined. The selection of the UCs to be migrated, the reporting of the generation contracts of these UCs, market research, the preparation of Terms of Reference, the survey of the technical adaptations of the UCs, and the preparation of a public notice for the acquisition of energy generation were all completed. It should be noted that the first UCs were migrated in February 2024 and the last will be in September 2024, at a bid cost of R$101 per MWh.

The external consultancy has validated the comparison between the cost of energy in the ACL and how it would be in the ACR.

The data for the first three (out of nine) UCs in the ACL indicate that energy cost savings will be around 46% in 2024, as shown in Table 1. This performance is much higher than the initial expectation of 30% for high voltage UCs.

Table 1 - ACL vs. ACR energy - Feb to Mar/24

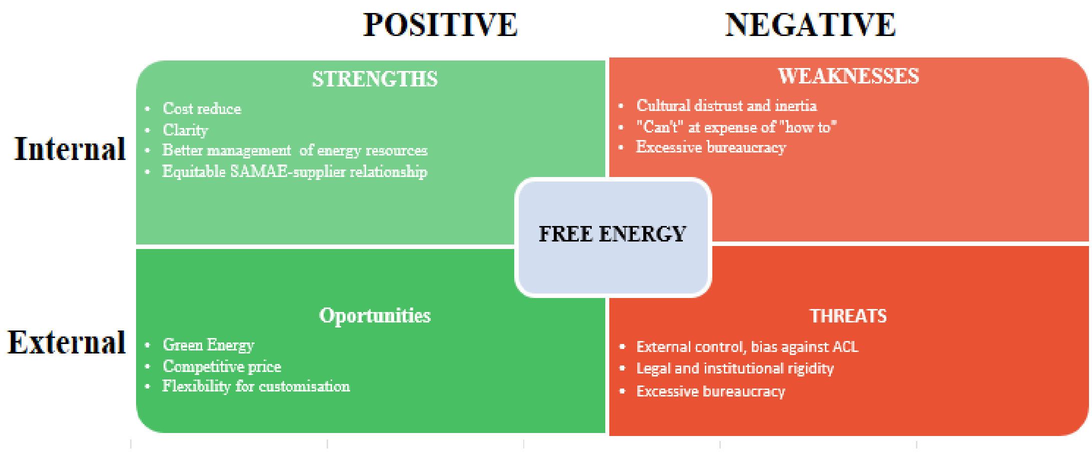
	consumption unit	id	ACL-R$	ACR-R$	Reduce-R$
feb	ETA SUL-TRATAMENTO - Sul T	43867830	3.718,51	6.596,24	2.877,74
	ETE ÁGUA VERDE - AV	245564363	25.877,63	47.622,41	21.744,78
	ETE SÃO LUIZ - SL	42666106	24.833,15	45.660,60	20.827,45
			54.429,29	99.879,25	45.449,97
mar	ETA SUL-TRATAMENTO - Sul T	43867830	3.474,98	6.343,55	2.868,57
	ETE ÁGUA VERDE - AV	245564363	26.714,86	49.464,47	22.749,61
	ETE SÃO LUIZ - SL	42666106	25.243,83	46.893,35	21.649,52
			55.433,67	102.701,37	47.267,70
			109.862,96	**202.580,62**	**92.717,67**
			54,23%	**100,00%**	**45,77%**

Source: Authors

There are two other institutional advantages: the diversification of suppliers, which puts the consumer on an equal footing with the supplier in the negotiation process; energy is now generated with incentives, i.e. from explicitly certified renewable sources (green energy), thus making a decisive contribution to the preservation of the environment.

As with any change, there are aspects that favour it and others that create obstacles. It's up to managers to assess whether the benefits outweigh the energy and wear and tear that is inherent in any process that changes paradigms that are rooted in the culture of the organisation. A summary is shown in Figure 2.

Figure 2 -SWOT migration analysis



Source:Authors

One difficulty in implementing this type of project stems from organisational culture and institutional inertia. It has always been the practice to contract all energy supply services (generation and distribution) with the local distributor, on the false premise that there is no choice. On the other hand, the legislation creating ACL dates back to 1995, i.e. 29 years ago. In spite of the difficulties: the sometimes-excessive bureaucracy, the initial reluctance (culturally normal) and the fact that it is still a work in progress, the economic and institutional benefits are undeniable.

It is highly recommended that other sanitation companies have a similar policy in place and that this process is maximised.

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