

## USE OF SELF ADMINISTERED ENERGY METERS – ACCESSIBILITY OF THE POPULATION WITH LOW INCOME RESOURCES TO SUSTAINABLE ENERGY

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### ABSTRACT

*Based on the evaluation made, as regards the accessibility to the electric power of low-income customers, establishing a sustainable solution that satisfied the needs of this population and at the same time enables the reduction of non-technical losses and late payment or arrears, Edenor (Empresa Distribuidora y Comercializadora Norte) has established a self-administered energy meter installation plan, which in the case of new settlements is preceded by the construction of standardized networks that ensure the quality of service established by the regulator. Nowadays, more than 150,000 units have been installed and, at the end of this year, it will be possible to reach 250,000 units.*

### INTRODUCTION

The total energy losses TI + NTL (technical -TL- and non-technical NTL), has a mobile annual value of 18.06 %, from which is estimated a non-technical loss of approximately 9%. If we consider that customers associated with large demands (which handle half of the energy) have a very low NTL, the residential component of NTL would be close to 20% which increases when considering the most underprivileged areas.

On the other hand, for customers where the self-administered meter has been installed the verified NTL value is <6%.

For these users, it was verified that there were difficulties in the payment of service bills, most of them due to the fact that the user's energy consumption without monitoring the accumulated demand, generated bimonthly amounts greater than the payment possibilities. This situation resulted in a gradual deterioration in the relationship between the customers with the company, where commercial agreements for payment in installments were often not sustainable over time. In these cases, it could also be verified that the conventional actions turned out to be economically and operationally difficult to apply because the areas where these clients are located made the regularization actions of the supply complex and they did not represent a containment scheme for clients of these characteristics.

Therefore, the self-managed energy service became a viable alternative that provides an answer to the needs of customers with payment difficulties.

### FEATURES OF SELF- ADMINISTERED ENERGY METERS

The self-managed meter is a single-phase electric energy meter, bi-body type, based on the technology of data transfer via digital keypad. It consists of a metrological part located outside the house and an internal keyboard / display to facilitate the administration by the clients.

The meter is usually installed high on a post (decreasing the possibility of fraud), in a closed cabinet on the outside of the user's house, thus facilitating its inspection.



**Fig 1** Height installation of self – administered meters in cabinets

The user interface unit is the only way that allows the client to interact with the meter.

It is equipped with a display and a user-friendly digital keypad and it is installed far from the meter, usually inside, linked with the meter through PLC (Power line communication).



**Fig 2** Self- administered bi-body meter (keyboard / display and metrological unit)

### **Customer benefits**

- a) Control expenses through purchases according to your economic possibilities.
- b) Save money. The value of electricity is cheaper (social rate).
- c) Control your energy consumption in real time.
- d) It offers the possibility of distributing the fixed charge in more than one purchase of the month.
- e) Perceive which devices consume more electricity, in order to make a rational use and according to their possibilities.
- f) Make energy purchases in different points of sale and in a wide hourly range including weekends.
- g) Have points of sale near your home.
- h) Access mobile applications (APP) to perform the energy recharge

### **Company benefits**

- a) Minimizes late payment or arrears
- b) Minimizes non-technical losses.

- c) Minimizes operating expenses associated with the treatment of clients with lower socioeconomic status.
- d) Customer complaints are reduced.
- e) It avoids the customer repeated attendance to commercial offices.
- f) Improvement in the business image. The client company relationship is strengthened.
- g) Eliminates the processes of reading, issuing and distributing invoices.
- h) Reduces costs overruns in hiring security staff for work teams.
- i) Improves loyalty. The client's perception is that the distribution company strives to find new agreements that cover its real possibilities.

It should be considered on the other hand that the installation of self-managed type meters presents higher initial costs for the distributor

- a) The connection is more expensive than a conventional equivalent in the same tariff, given that the cost of the self-administered meter is higher than the one of a conventional meter and it must be placed in height in the open and inside a sealed box.
- b) Although the invoicing is done on the System of the distributor, there are additional costs for the installation of application servers that guarantee an adequate response time for each sale transaction.
- c) Additional costs due to the need of adding an external integrator to the project that provides the points of sale (similar to those of prepaid telephony)

### **Social benefits**

Edenor offers its customers this modality according to their profile and / or commercial history, which allows:

- a) Social inclusion of these families by enabling them to match the payment behavior with the rest of society.
- b) Facilitates the access and permanence of more families to the use of electric power.
- c) It is an excellent tool to implement direct subsidies to consumption or social rates. Customers acquire a culture of efficiency in the use of energy.

d) It is possible to collect a greater amount of taxes that can be used to improve the living conditions of the population, essential to advance a plan for the normalization of disadvantaged neighborhoods

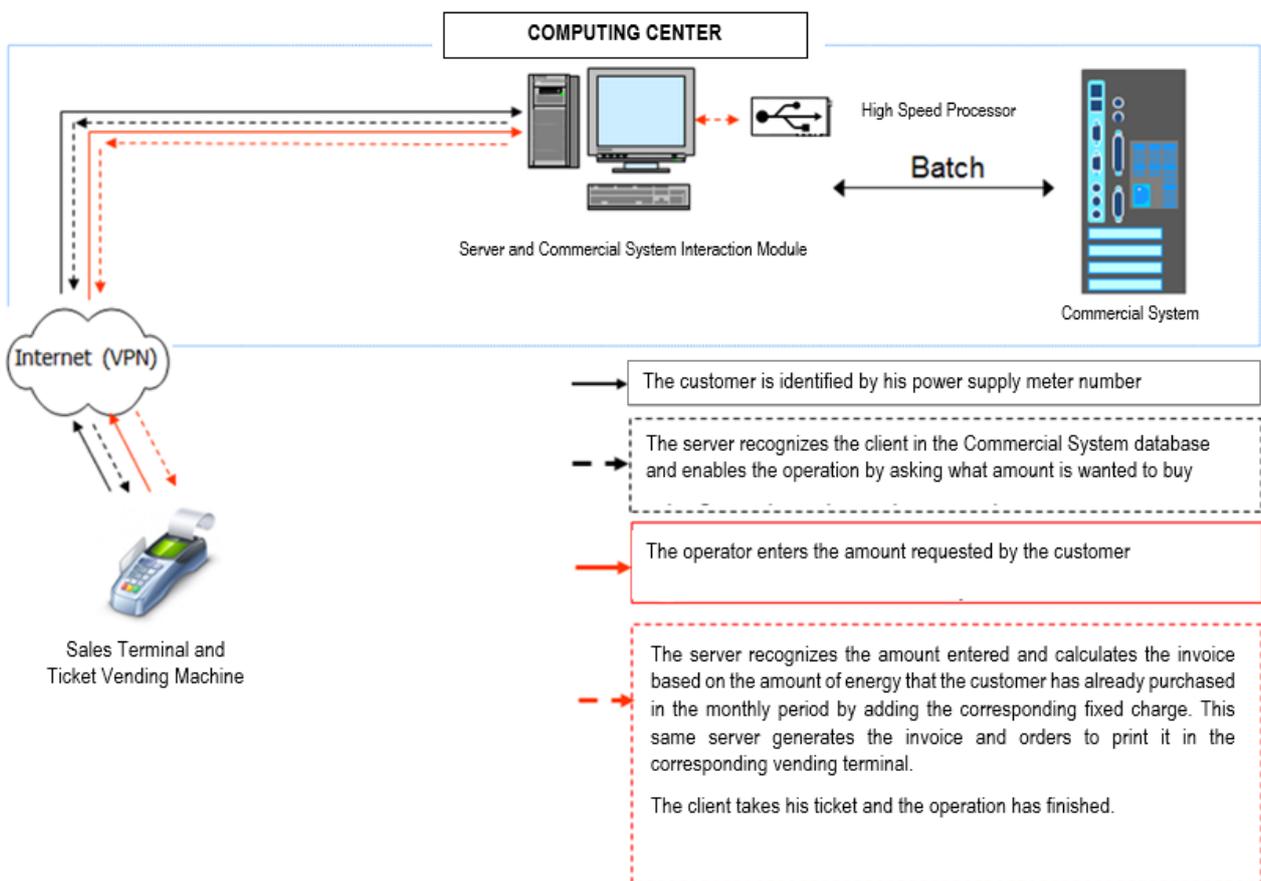
**Additional considerations**

In order to ensure the success of the implemented method, we will make some additional considerations.

a) The rate applied to these customers should not be higher than that of residential customers with conventional measurement and bimonthly billing.

b) The cost of the technology and the installation of the meters and systems of sale should not represent any charge for the client.

c) Adherence to the self-administered system must be voluntary on the part of the client.



**Fig 3** Energy purchase and validation process

**Lower vulnerability of trunk networks**

Although the self-administered meter, is a fundamental element in the strategy established to enable access to low-income sectors to the electric power service, since it was designed to allow the customer willing to pay, self-control, consuming electricity according to its economic possibilities, in a sustainable way, it is not the only factor that distribution companies should take into account.

In many places or neighborhoods that presented characteristics of greater social vulnerability, complementary actions have been carried out and other solutions have also been implemented to provide a service that, in addition to being accessible and sustainable for the client, provides a way to reduce the non-technical losses.

We can mention as actions of this type

a) Sealing (gluing) of meter cabinets placed in height, because from the analysis of the database of customers, who did not present purchases in a certain period or that their purchase was well below average, anomalies were detected that affected the company's billing. As a typical example of this situation, there were bridges between phase entry and exit. inside the cabinets in the meters placed in height.

b) On the other hand, when carrying out verifications in some deprived neighborhoods, direct connections to the trunk aerial network were observed (irregular - without going through meter). To avoid this situation, a type of network – MULCON – **M**ultiple **C**oncentric cables was designed to locate the meters in concentrated form in

columns of 14 meters, and from that point onwards, for each user, a connection was made with a concentric cable, which makes it difficult to connect directly to the trunk network line since it is, in most cases, hundreds of meters from the point of supply.

### CONCLUSIONS

The mass use of the self-administered meter accompanied by social tariffs and, where necessary, the implementation of new and less vulnerable networks, allow access to sectors of the population, to the electric power service in a sustainable manner enabling a benefit for all sides (customers, utilities and society).