

Energy Loss Management

Latin America

Technical Session 2: Loss reduction and the role of smart metering

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Introduction

Energy Loss

The region's electricity distributors have different levels of losses that depend especially on loss management strategies and environmental factors.

Climatic condition

Economic situation

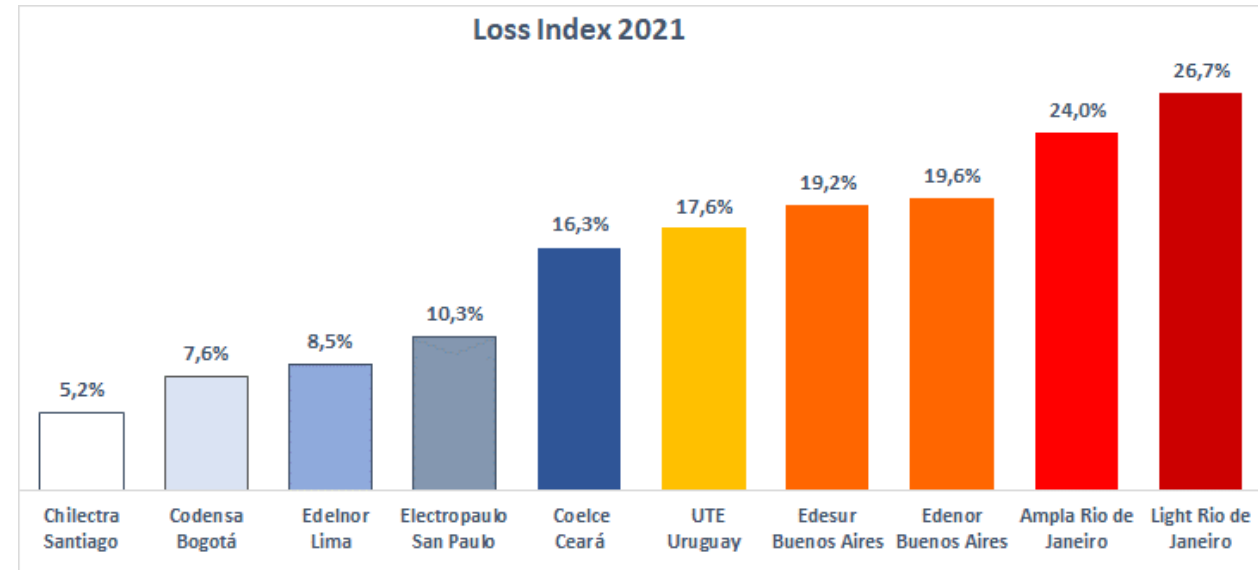
Political environment
country

Social development of the

I have participated in loss reduction programs in several countries, totaling 18.5 million consumers



Distributors that have incorporated new technologies in the measurement and protection of distribution networks have reduced and maintained their loss levels.



Transcendent factors such as the weather, the economic situation, criminality, urban disorder, etc., are outside the scope of action of the distributors.

The distribution companies can intervene directly in the **vulnerability of the network and of the metering equipment**. In addition, they can transform the relationship with communities and customers in general.

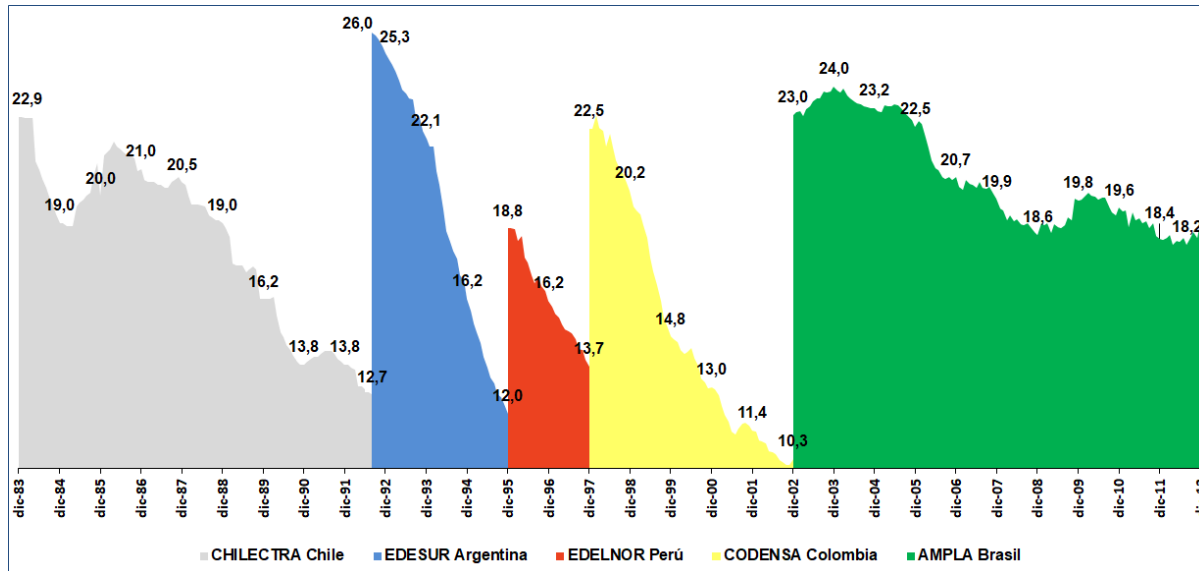
Reference companies in Latin America

Action strategies

Companies that have adopted Comprehensive and Permanent Programs to reduce losses have obtained excellent financial and operational results.

The initiatives focused on the following aspects:

- **Protect the product (networks and measurement equipment).**
- Facilitate access to electricity.
- Educate about the correct use of energy (**52% waste**).
- Energy efficiency.



Technical Measures



Commercial solutions



Control Actions



Energy efficiency



Relationship and
Social Integration



Information systems and OT/IT
technologies

Technical Measures

Anti-theft technologies

In the last decade, the most relevant advances were the large-scale incorporation of Electronic Metering and the creation of anti-theft energy distribution systems. The main objective is to prevent or hinder third party access to the low voltage distribution network and to protect the metering equipment.



Anti-Theft Networks - DAT

- LV network protected by the mounting height and the presence of the MV network.
- Externalized electronic measurement.



Anti-theft Machines Medium Voltage Customers

- Measurement equipment out of reach of the client.
- Electronic management with sensors.



Anti-theft Networks – LV Zero Network

- Elimination of the Low Voltage network.
- Encapsulated and shielded electronic measurement in transformers.



Externalized Metering Low Voltage Customers

- Measurement equipment out of reach of the client.
- Electronic management with sensors.



Low Voltage High Network

- Pre-assembled cable installed on poles of greater height (9 to 12 meters).
- Meters in hermetic boxes.



Shielded measuring cabinet

- Automated protection system. It has sensors for opening, breaking, shock, etc.
- Energy balance with automatic cut-off



Low Voltage network with protected cable

- Pre-assembled cable with high resistance flexible protective layer.
- Shielded connectors.



Centralized Electronic Metering

- Metering equipment installed in the distribution network outside the reach of the customer.
- Commercial electronic management.

Commercial solutions

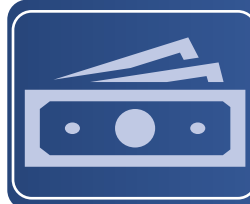
Action lines

The commercial solutions are intended to promote changes in the behavior of customers, in relation to the consumption and payment of the electricity service.

It is important to bear in mind that, in low-income sectors, energy theft is not considered a crime and, therefore, the value of this resource is not recognized.

With the application of programs to fight against energy theft, a significant number of consumers need a period of education and adaptation to the new commercial relationship with the distribution company.

Commercial solutions must facilitate the payment of consumption during the adaptation period and keep customers out of the vicious cycle of energy theft.



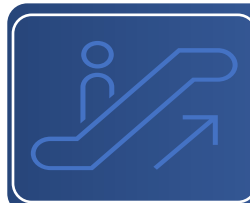
Special energy tariffs

- Negotiate with the regulatory authorities the application of subsidized tariffs.
- Compensated subsidy in tariffs.



Debt Financing Plans

- Payment plans with progressive discounts.
- Cancellation of debts and fines after a period of good behavior (6 to 18 months).



Staggered Billing

- In areas of application of massive technical measures, as a complement to make the transition from theft to full payment of energy.



Government Financing

- Total or partial financing of energy accounts by the authorities (Government, Municipalities, etc.)

Control Actions

Action lines

These activities are aimed at discouraging energy theft, making its cost tangible through the collection of fines and stolen energy. To the same end, direct punitive measures should be applied, such as police and judicial actions.

Legal actions and operations with the police and experts should be applied only in specific cases and their main objective is to suppress theft in emblematic and/or recurrent cases.

An internal organization is necessary to control misconduct and investigate cases of corruption of own officials and contractors.

If there are high levels of corruption, it is essential to count with the participation of private companies specialized in the investigation and dismantling of criminal organizations.



Collection of stolen energy and fines

- Administrative collection
- Prejudicial collection
- Credit restriction in financial entities



Suppressive Activities

- Actions in conjunction with the police to repress repeat offenders or special cases.
- Immediate imprisonment of offenders.



Lawsuits

- Civil processes. Collection of economic damages.
- Criminal proceedings. Criminal treatment of the crime.



Control of behavioral deviations / Corruption

- Identification of irregular activities.
- Adaptation of selection processes.
- Specialized research.

Energy efficiency

Action lines

The main objective of this initiative is to combat the waste of electricity generated by defective installations and equipment. This type of intervention produces a significant decrease in energy consumption and is an important step in adjusting the payment capacity of low-income customers.



Relationship and Social Integration

Action lines

To give sustainability to the commercial relationship with the most disadvantaged sectors, it is necessary to implement actions of a social and educational nature with the aim of guiding and directing consumers towards the conscious and rational use of electrical energy. In a complementary way, to make educational programs viable, it is necessary to introduce actions aimed at generating income.



Education for informed consumption

- ✓ Contribute to the education and construction of a new generation that is committed and aware of the social and environmental impacts of energy consumption.



Income generation and local development

- ✓ Carry out practical actions to generate income, civic education and professional training in the communities, with an emphasis on safety, rights, duties and the informed consumption of energy

Education for informed consumption

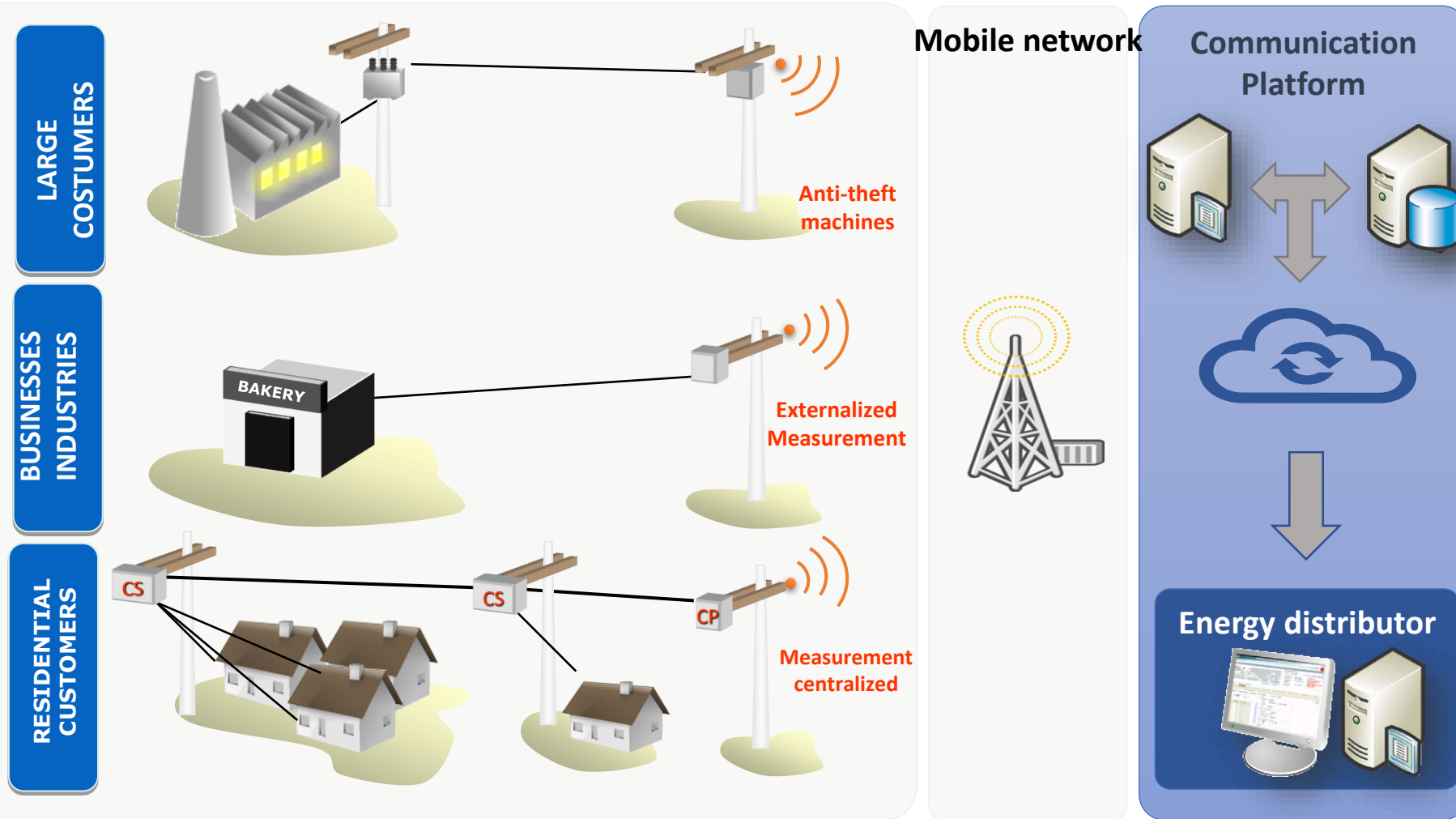
- Education in the Communities
- Energy efficiency at home
- Itinerant education
- Education in schools

Generation of income sources

- Art and craft courses
- Citizenship - Rights and duties
- Waste recycling and environmental education (electricity vouchers for the value of the waste)

Information systems and OT/IT technologies

Main Innovations – Electronic Measurement

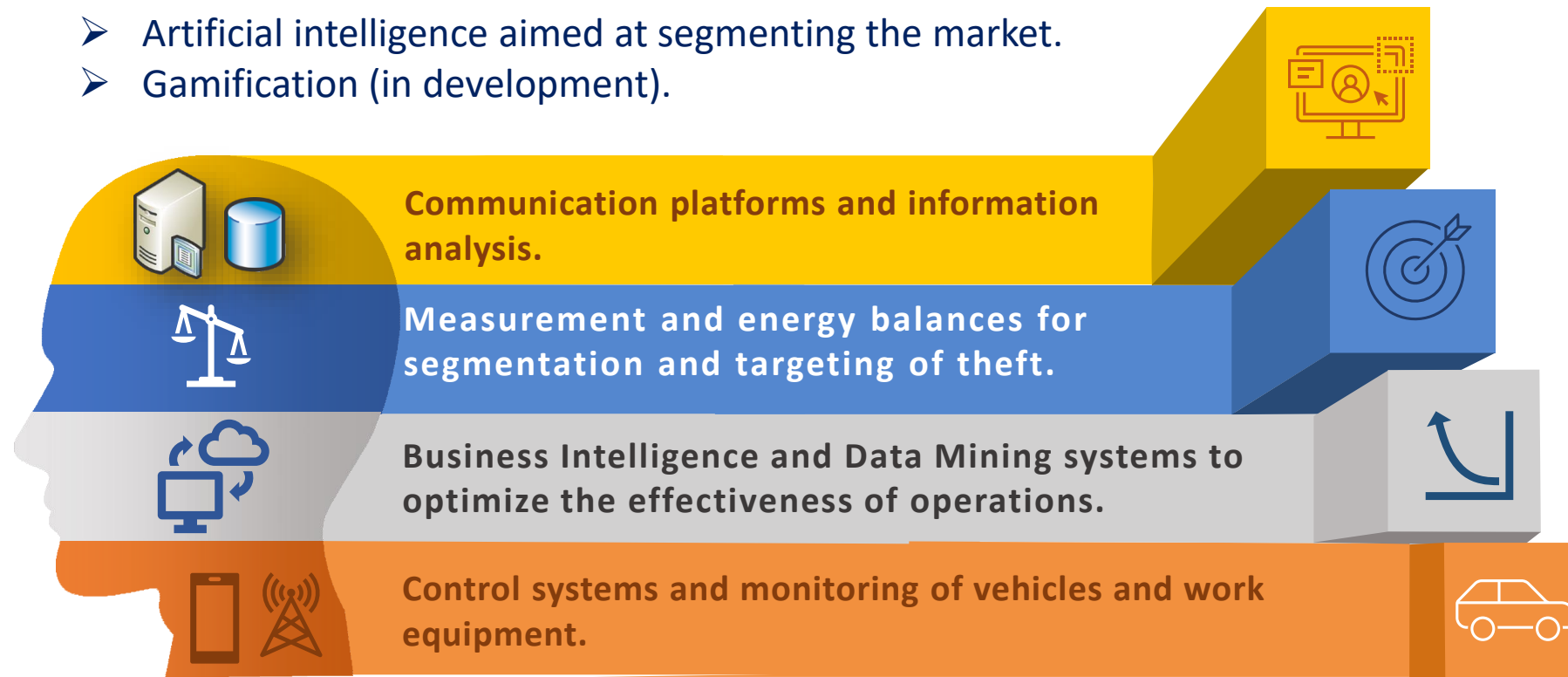


- Have real-time information on the status of the measurements.
- Identify regions and individual consumers with losses due to energy theft.
- Automate the actions of reading, cutting and reconnecting clients.
- In low-income areas, implement prepaid energy systems and the so-called "social court" (limit the availability of energy in case of non-payment)-

Information systems and OT/IT technologies

Main Innovations - Information Systems

- ❑ Creation and development of systems to optimize operations and generate new forms of fighting energy theft.
 - Identify consumption patterns of consumers with energy theft.
 - Detect sudden changes in consumption habits.
 - Type of activity with the greatest susceptibility towards energy theft (ice factories, bakeries, etc.)
- ❑ Incorporation of new technologies and processes
 - Artificial intelligence aimed at segmenting the market.
 - Gamification (in development).





Thank you



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