OBJECTIVES

- Development of calculation models in order to evaluate the impact of disturbing loads on the distribution system.
- The disturbing loads considered are: induction motor, x-ray device, welding machine and electric arc furnace.

APPROACH

- Network and Load Models.
- Induction motor model for the transient condition.
- Acquisition of the electrical equivalent circuit through the nameplate data using an evolutionary algorithm.
- Models for X-ray devices, welding machines and arc furnace.
OBJECTIVES

• To identify customer-types' responsibilities on marginal costs
• To design a tariff structure for efficient allocation of the utility’s permitted revenue

APPROACH

• For several customers, active power is measured in a 5-minute interval for several days.
• Chosen Load curves are grouped using statistical correlation instead of k-Means with Euclidean distance.
• Customer responsibility is defined using a statistical correlation function.
• Optimization process is formulated for solving the conditional probabilities problem.

RESULTS

• Simpler and more efficient method for classifying customer load curves.
• Consistent tariff structure, based on customers' responsibilities on the usage of the distribution network.
OBJECTIVES

Presents the methodology and the application of a market study model based on Geographic Information System for electrical load studies.

APPROACH

- Forecast studies: global forecast and spatial forecast.
- ARIMA Model (Box-Jenkins).
- Model in accordance with the Brazilian Regulatory Agency procedures.

RESULTS

Geo-referenced representation of the consumption per geographical entity

Historical series for the total consumption and customer type

Result of the time series forecast
OBJECTIVES

• Presenting a method for calculating technical losses with corrections from measurements.
• Calculating non-technical losses considering energy not billed.

APPROACH

• From topological, billing and measurement databases, a correction factor is calculated.
• This factor is applied to billed energy and variable losses.

RESULTS

Method applied to 8 substations and 83 primary feeders.

<table>
<thead>
<tr>
<th>Segment</th>
<th>Energy Loss Without Correction</th>
<th>Energy Loss With Correction</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>[kWh]</td>
<td>[%]</td>
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<tr>
<td>Distribution Substation</td>
<td>886,416.56</td>
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<td>LV Network</td>
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<td>Customer Connection</td>
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<td>Power Meter</td>
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<tr>
<td>Others</td>
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<tr>
<td>Technical Losses</td>
<td>5,441,972.42</td>
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<tr>
<td>Non-Technical Losses</td>
<td>-</td>
<td>-</td>
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</tbody>
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