

InovCity Aparecida

Developing a smart grid project in EDP Brazil.



Ecil Energia



Ecil Energia is a Brazilian company, with Ecil Group's tradition and strength, founded in 1929.

Ecil Energy works in the areas of Automation, Control and Protection of Distribution Substations and Power Transmission.

Products: Smart Energy Meters, AMI/AMR, Reclosers and Circuit Breakers, Automation and Protection System (e-SIP), Connectivity and Industrial Computers.



EDP = Brazilian's Pilot Project: Aparecida City



35.000 inhabitants;
15.300 power customers;
121 km²;
Tropical weather;
High HDI Level (0,804);
R\$9.988/ person GDP.

R&D Project:
Smart Meters;
Public Lightning;
Distributed Generation;
EV Support.

Investment :U\$ 4 Million

Tourism town
with 1% of the
energy users of
EDP
Bandeirante



First Stage: 6 Different Areas

Efficient Public Lighting



- LED.

Energy Efficiency



- More efficient lamps, refrigerators and showers donated to low income consumers.

Distributed Generation



- Solar PV pannels performance test.

EV Support



- Eletric vehicles.

Smart Metering



- Smart Meters: 100% LV units

Community Awareness



- Educational programs within local institutions

Main Characteristics

Aparecida Project (InovCity)

METERS LV
TOTAL: 13.800

ZIGBEE
Coordinator

SW – Management

1. Grid Management;
2. Loss Management;
3. Process Flags;
4. Metering Portal;
5. CCS Integration;
6. Tariff Management.

Single Phase:
1.500
Two Phase:
10.900
Three Phase:
1.400

A1: 01
A4: 34
MT: 6
CME: 11
ETs: 460

200 units

Meter and Coordinator: 100% Brazilian Technology



Meter

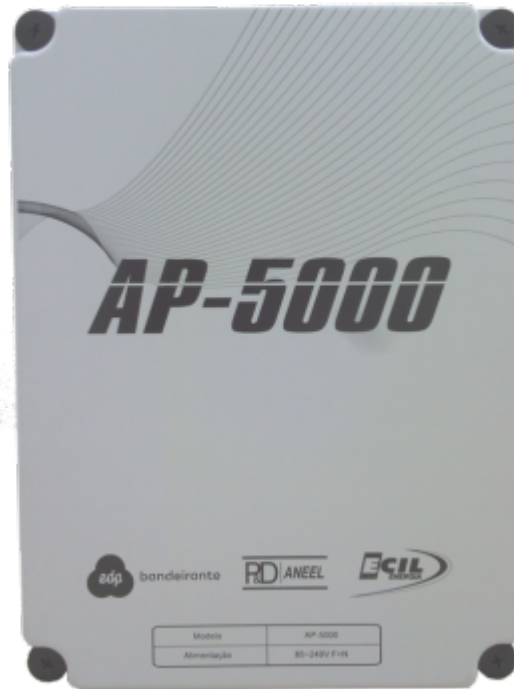


Coordinator



R&D: EDP Regulatory Budget and Ecil Energia Technical Development.

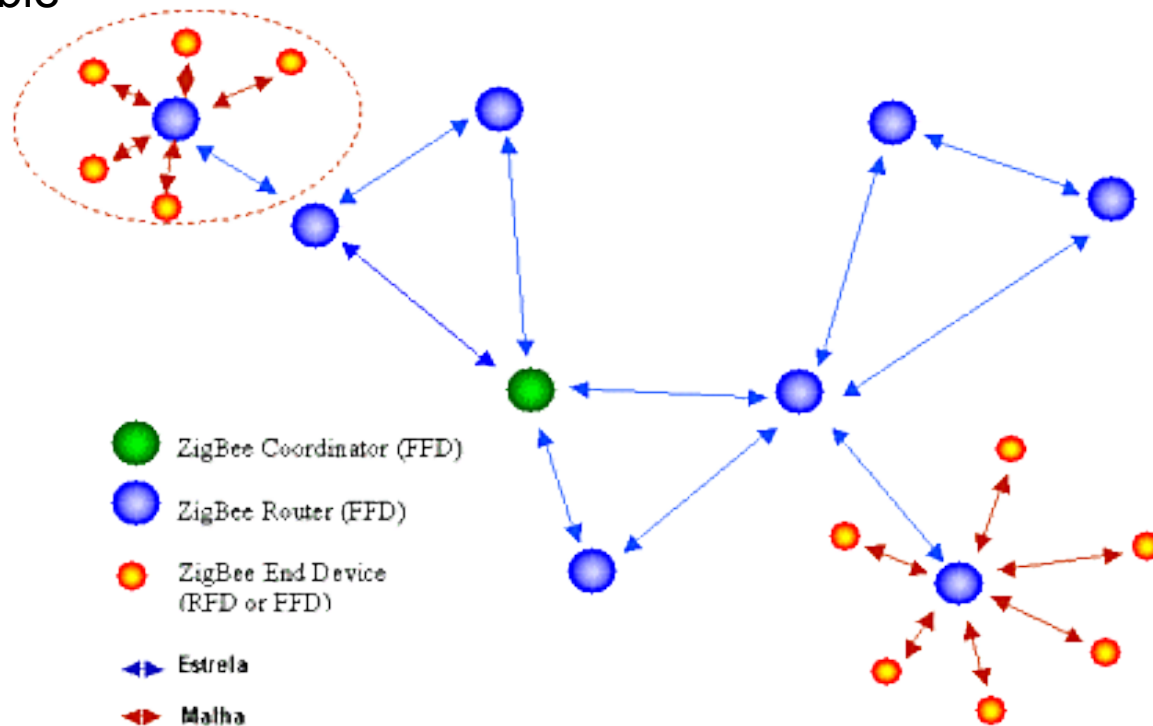
ZIGBEE Gateway



- Up to 8 Zigbee networks;
- 8 directional antennas;
- GPRS/GSM/ 3G compatible;
- Ethernet, Bluetooth, Wi-Fi and WiMAX;
- Backup Battery;
- IP66 – External Use Installation.

Advantages of zigbee

- Wireless communication with expected range of up to 500 meters;
- Operating Frequencies between 868 MHz and 2.4 GHz;
- Transmission rate around 250Kbps;
- Low power consumption;
- Low implementation costs;
- Variable Network topology;
- Interoperable



Disadvantages of GPRS

Speed

Due to the low number of GPRS Base Stations, specially in Aparecida, typical connection speeds are below 56K, when full connections are available.

No Quality of Service

The public GPRS networks in Aparecida grant voice connections priority over data connections yielding a high number of disconnections for the data applications

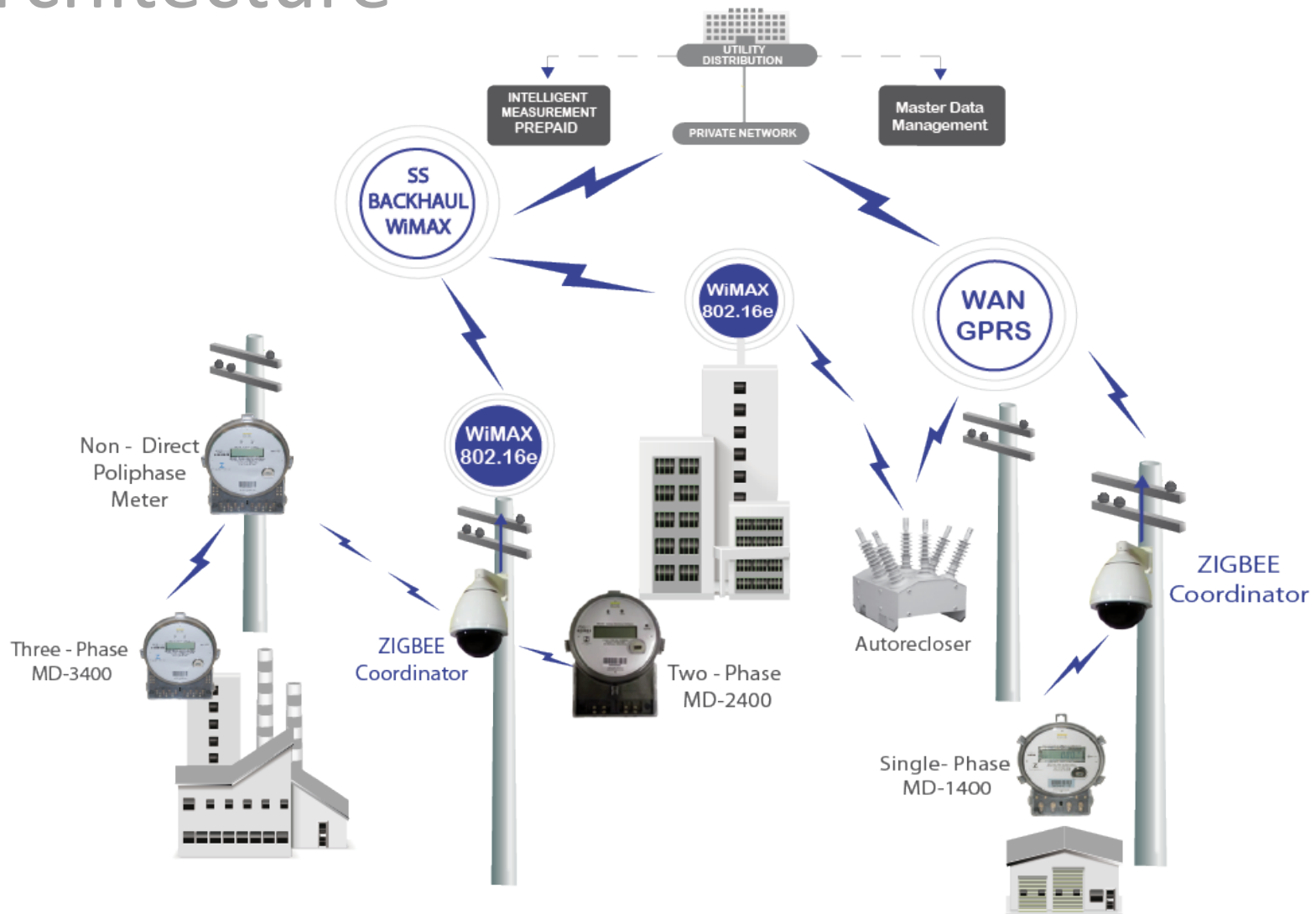
Reliability

Service availability is below 95% due to poor implemented infrastructure.

Service Costs

Available GPRS connections are billed based on data volume transferred, with high prices per contracted maximum bytes transferred in a month. Services costs for the data volumes needed are prohibitive.

Architecture



SMART METERING MANAGEMENT



edp bandeirante

SMM
SMART METERING MANAGEMENT

Usuário : barbarisi

ECIL

Sistema Importações Rede Elétrica Instalações Gateways Medidores Displays Smart Tug Comunicação Comandos Portal Web Cliente Sair

Bem Vindo Usuário: barbarisi Data: 20/02/2013

Funções

Últimos Eventos [13919] Marcar Todos Eventos

- O Medidor 13278213 está apresentando um Erro em sua comunicação.
- Ocorreu um Novo Desligamento do Medidor 13278213.
- O Medidor 13278211 está apresentando um Erro em sua comunicação.
- O Medidor 13278207 está sem Carga.
- O Medidor 13278207 está apresentando um Erro em sua comunicação.
- O Medidor 13278206 está apresentando um Erro em sua comunicação.
- O Medidor 13278206 está sem Carga.
- Ocorreu um Novo Desligamento do Medidor 13278206.

Comunicação Medidores [2206]

1108 1098

Comunicando Sem Comunicação

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Software responsible for the telemetry system, managing the complete network and meter status in InovCity, in addition to the connection to the various EDP enterprise systems.

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P&D BD-ES-004-10

- METER BILLING + POWER QUALITY



P&D BD-ES-003-10

- HOME CONTROL



Internal Topology - Home



Thank You!!

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