



RIO+20
United Nations Conference
on Sustainable Development

Overview - Experiences of ITAIPU in the Electric Vehicle Project

Rio de Janeiro - 2012 June 18th.

Eng. Celso Ribeiro Barbosa de Novais
CTO - Sustainable Electrical Mobility ITAIPU BINACIONAL

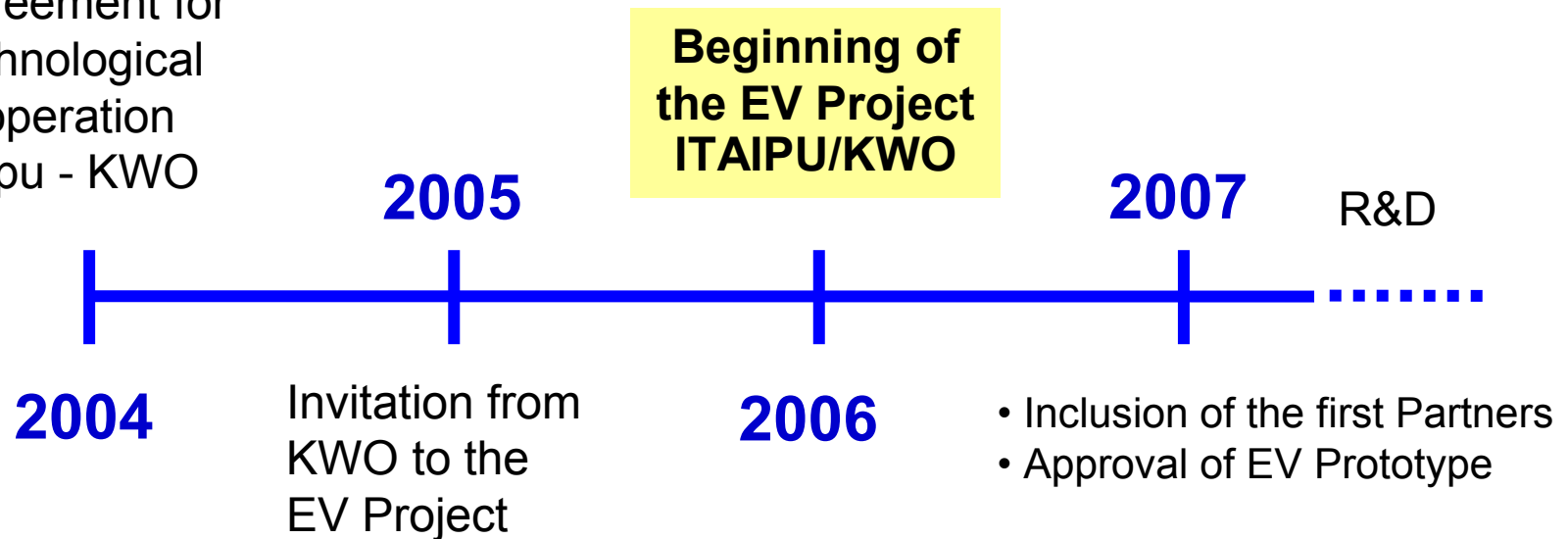


Ministério de
Minas e Energia



Historical of the EV Project ITAIPU/ KWO

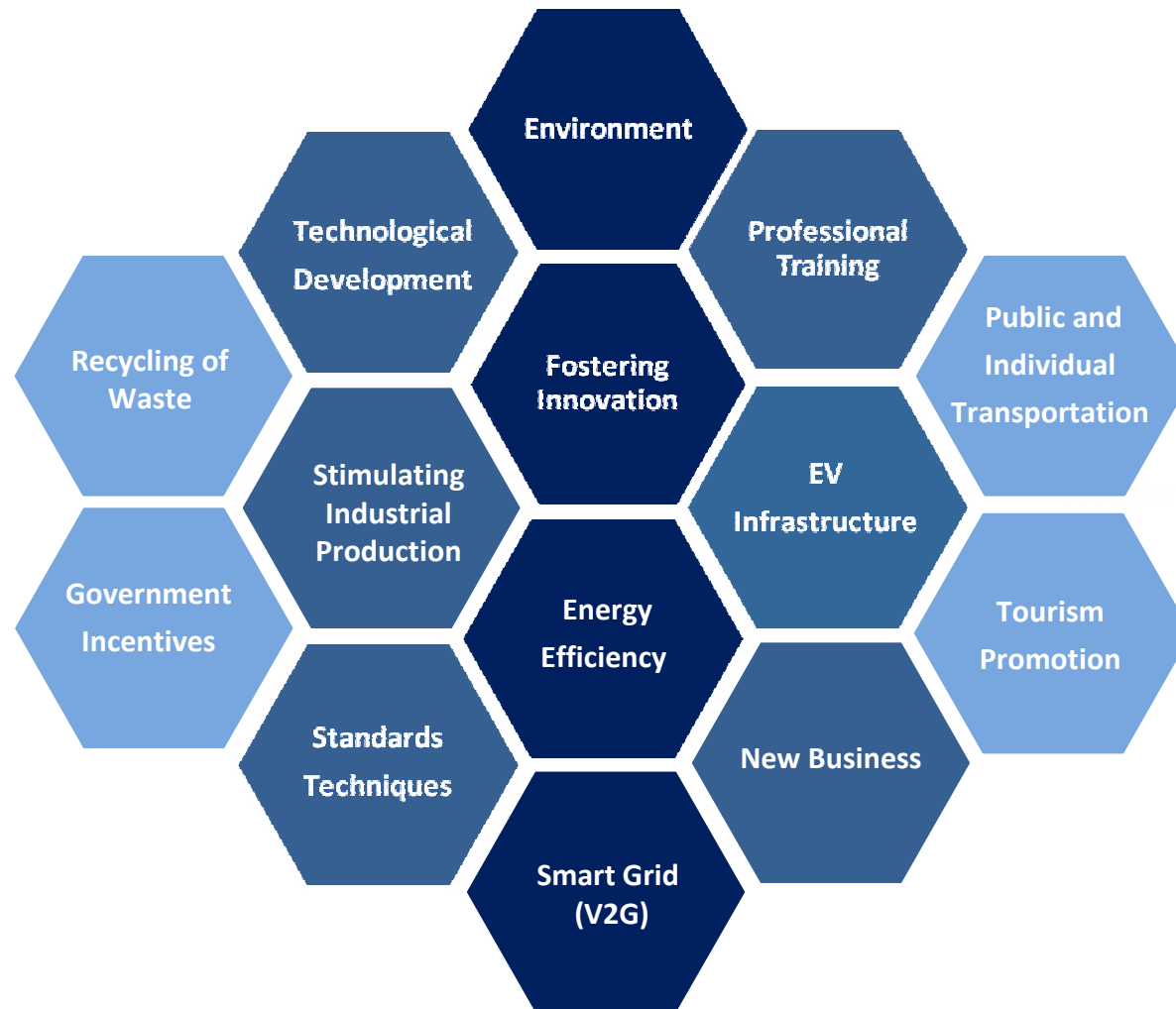
Agreement for technological cooperation Itaipu - KWO



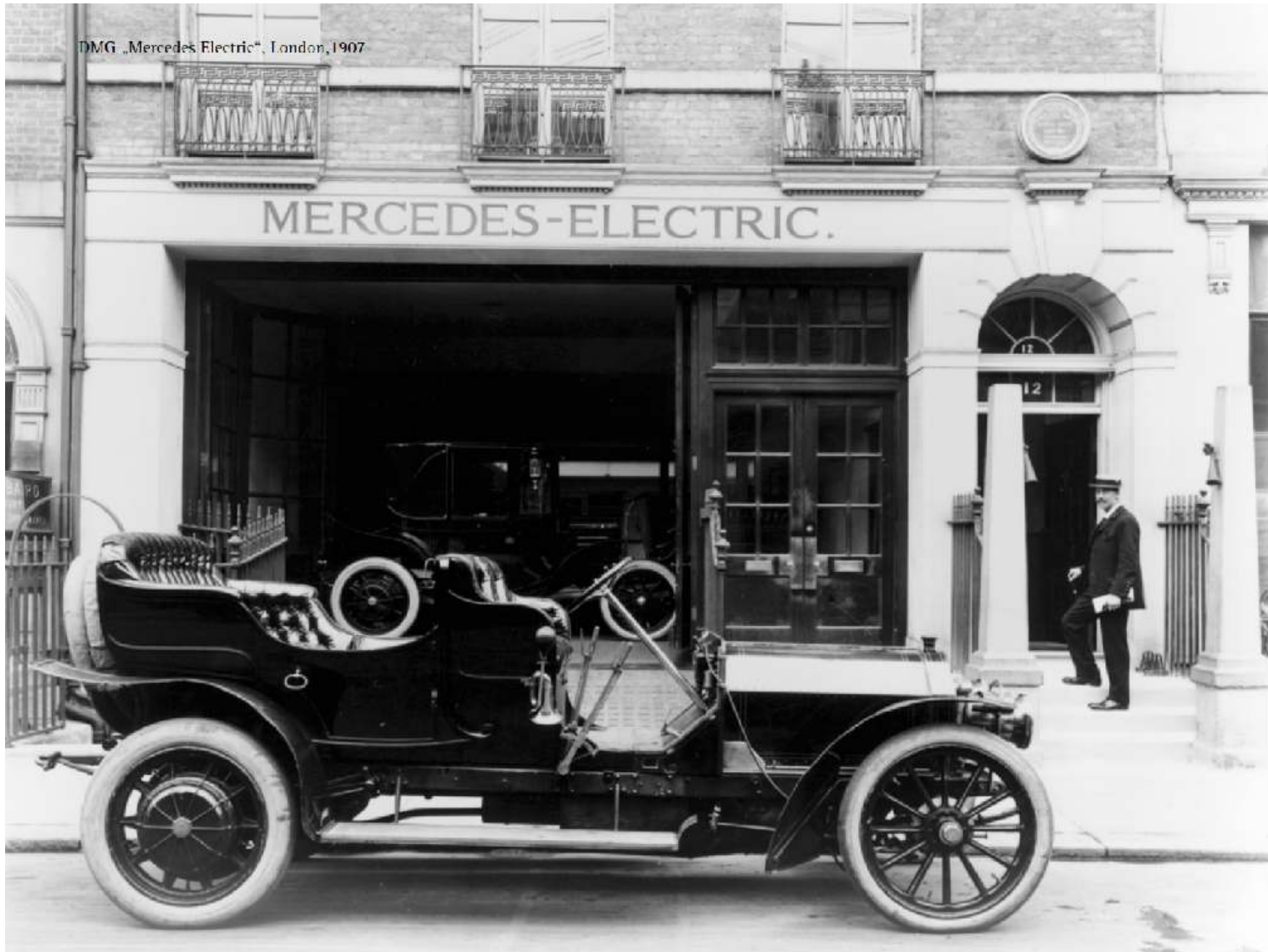
Objective:

Contribute to the **development of technology** for electrically powered vehicles in order to be **technically and economically feasible** promoting **rational and efficient use of energy** and **environment preservation**.

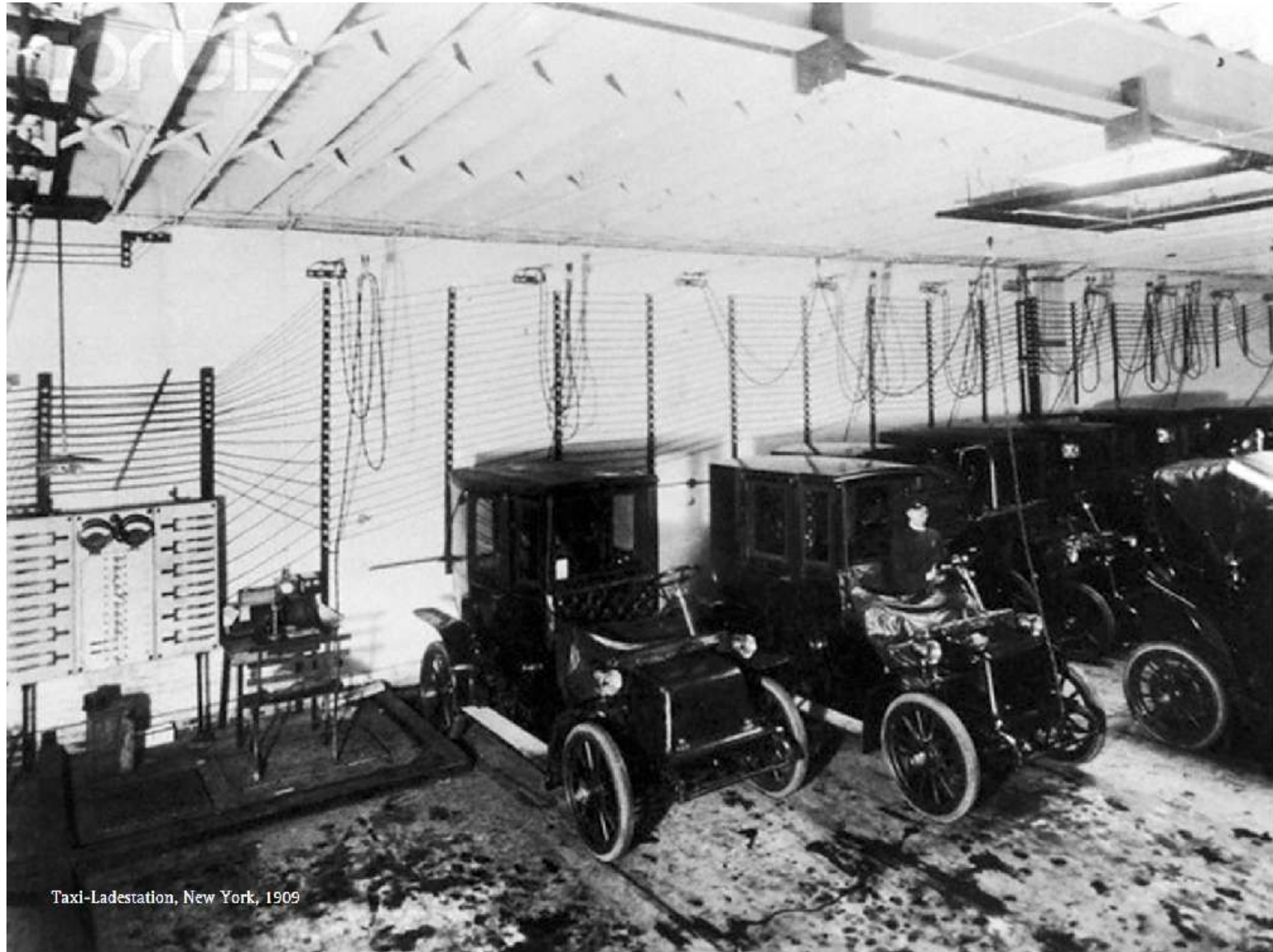
Areas involved in the Sustainable Electric Mobility



Mercedes Electric / Londres - 1907



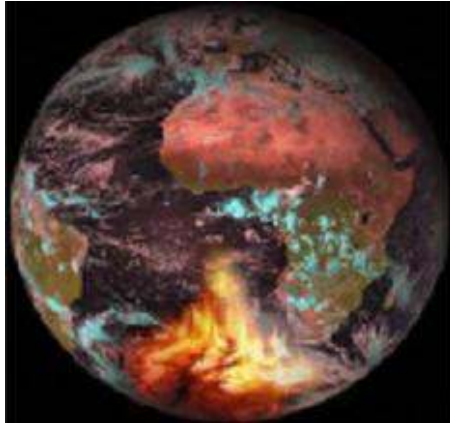
Charging Station for Electric Taxi, New York -1909



Taxi-Ladestation, New York, 1909

Appears a New Conjuncture

Climatic Change



Limitation of Natural Resources



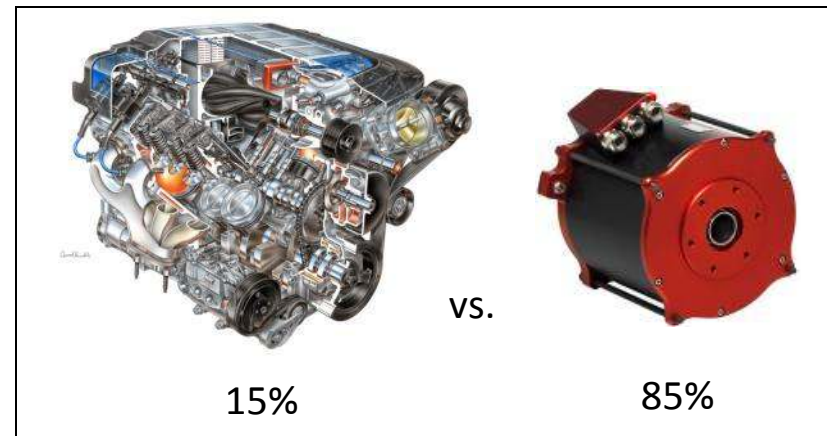
Greenhouse Gases



Technological Development



The Importance of Energy Efficiency



Specific situation of Brazil in terms of CO2 emissions

Comparação entre o perfil das emissões de GEE do Brasil e do mundo em 2030

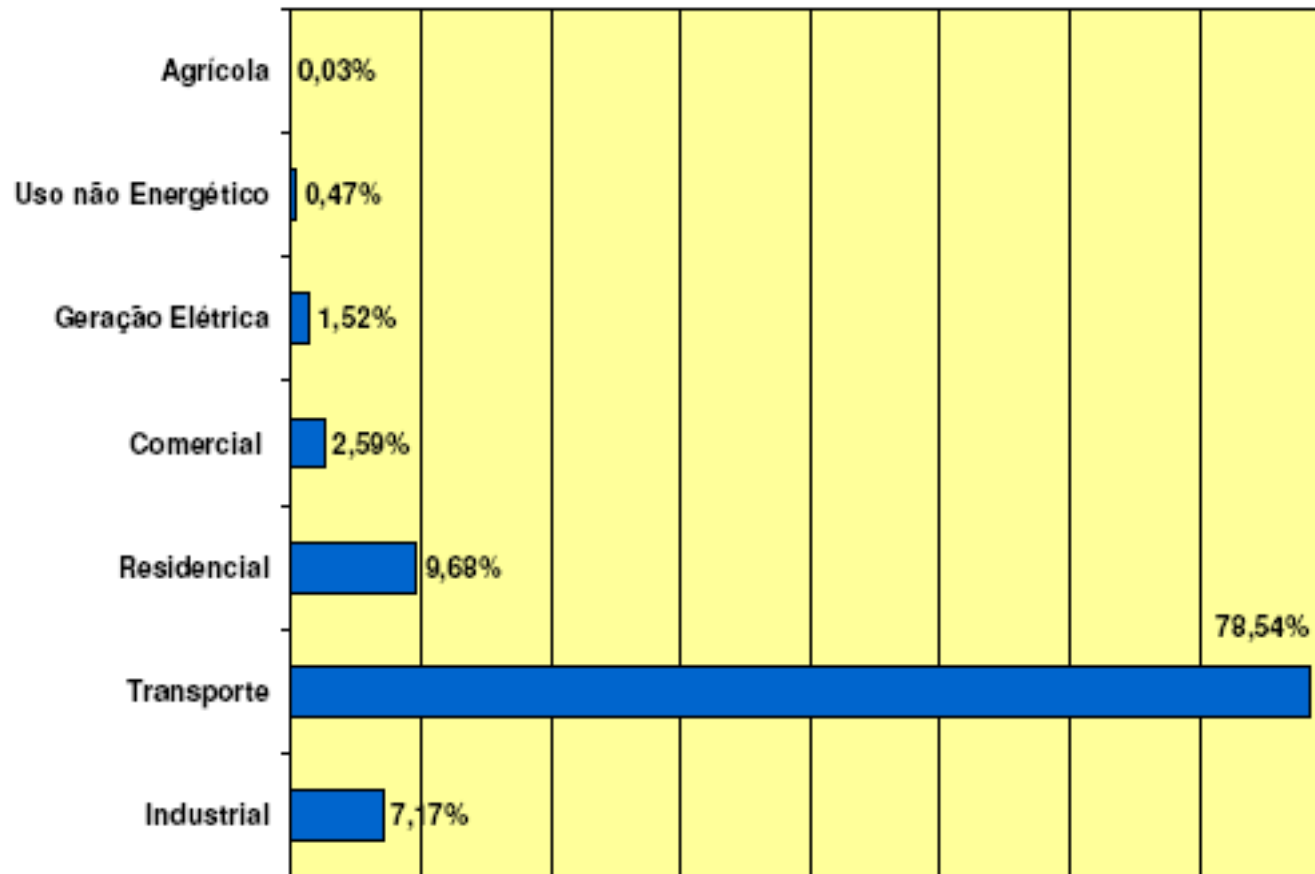
GtCO₂e, emissões diretas no caso base, 2030

○ Peso relativo (%)



The contrast of Urban Reality

Gráfico 4. - Contribuição dos Setores Sócio-Econômicos nas Emissões do Uso de Energia pelo Município de São Paulo, em 2003 (%).



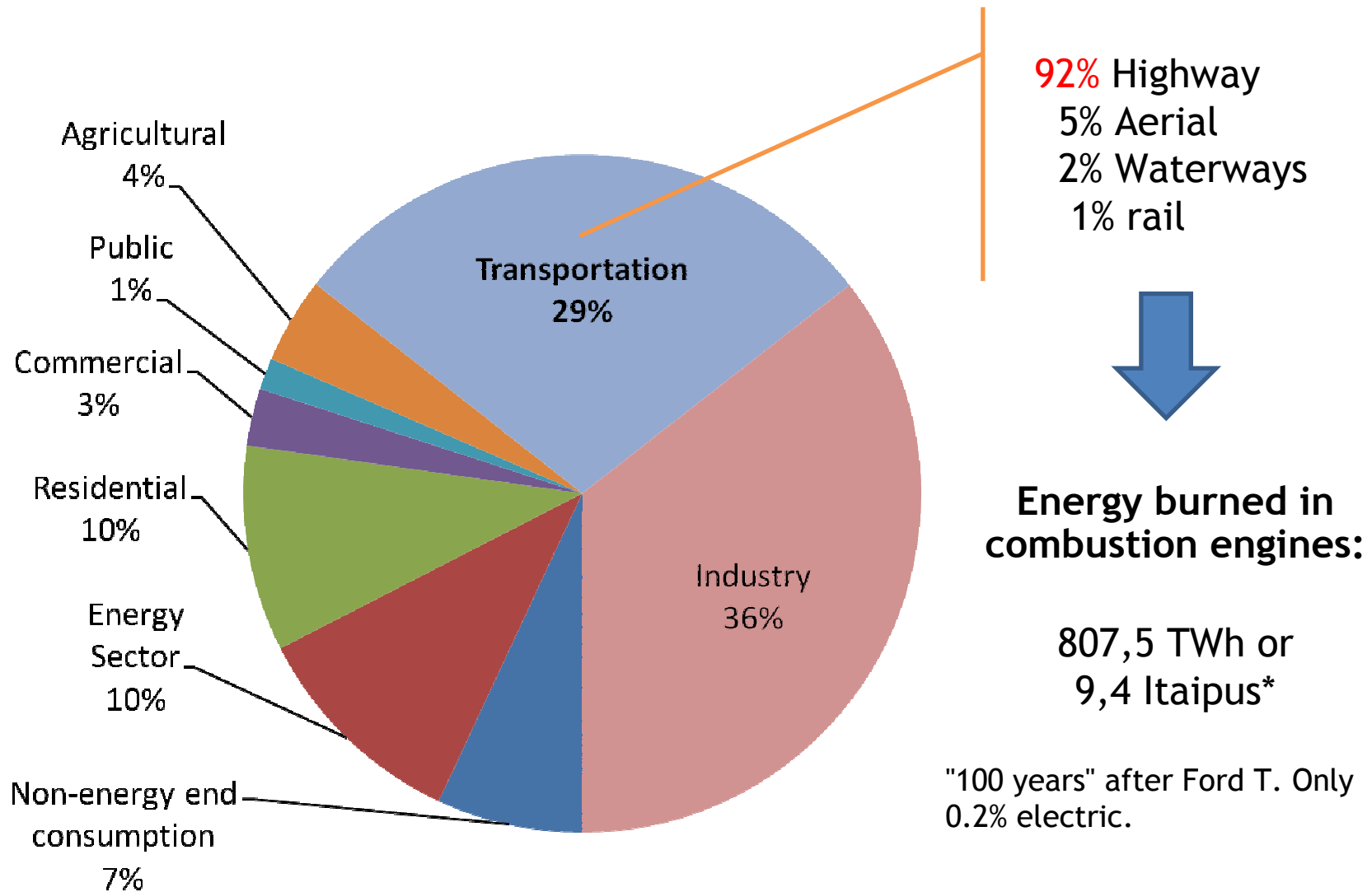
Fonte: Prefeitura de São Paulo/Secretaria do verde 2005

Conclusion 1:

In Brazil for metropolises,
electric vehicles are interesting.

Profile of Energy Consumption in Brazil

Use of Natural Resources

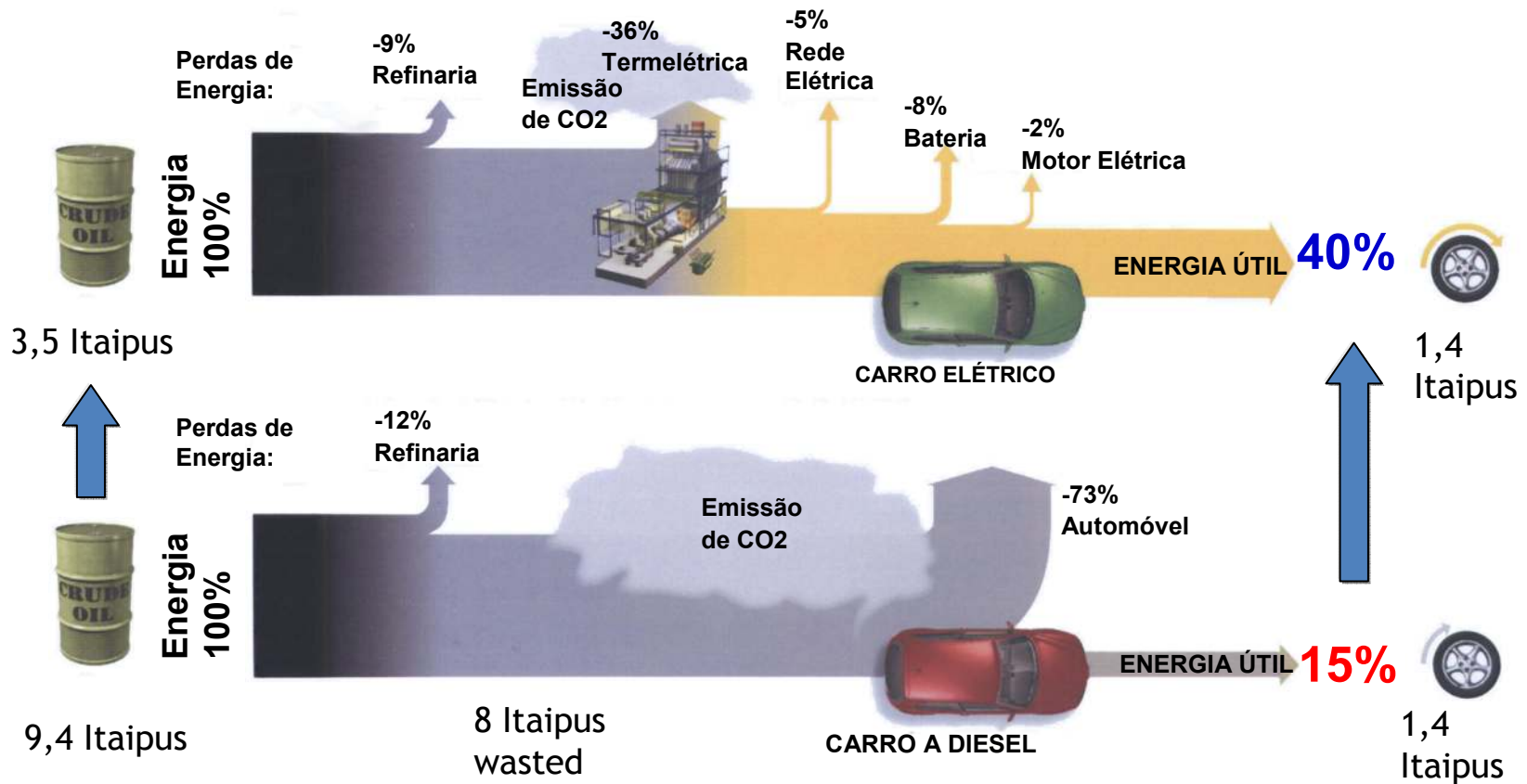


Will be possible to improve the use of natural resources?

Efficiency Analysis: Diesel vs. Electric

It is preferable to use a diesel power plant to produce electric energy than it puts in the tank of the car!

Compare energy efficiency (well-to-wheel) between a Car Diesel / Electric Car



Cost of energy, with residential tariff for every 100 km traveled: ~ \$ 3.00

Conclusion 2:

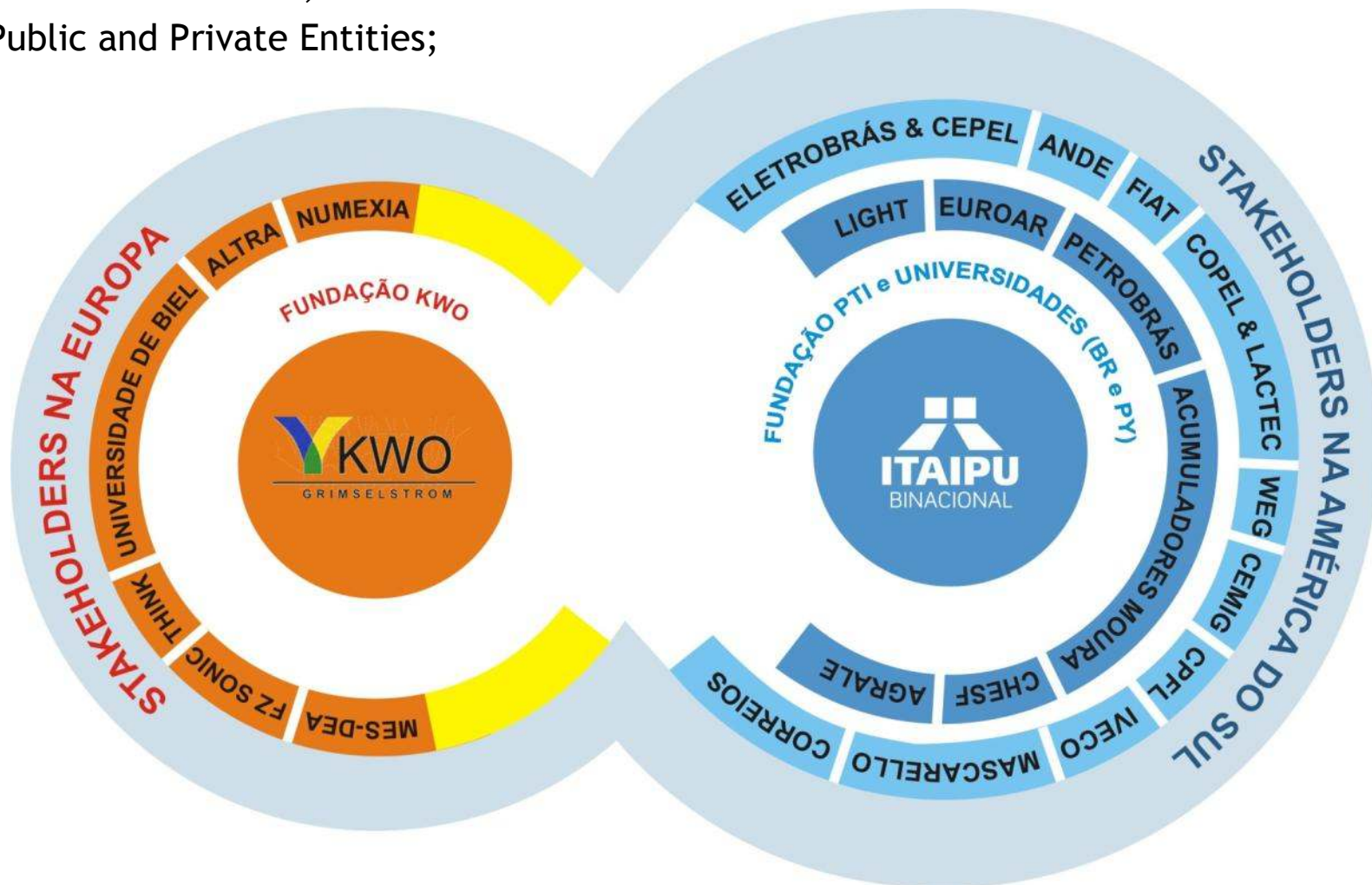
In Brazil, we could save energy equivalent to the production of 8 Itaipu Power Plants per year, which are now converted into heat and pollutants.

Advertising and Promotion Project



Idealized Profile and Partners

- Producer of Batteries and Electronic Accessories;
- Automotive Assemblers;
- Electrical Energy Concessionaires;
- Research Institutes;
- Public and Private Entities;



Centre for Research, Development and Assembly of the EV of ITAIPU



2006: Recursos Eletrobrás



2006: Obras de Adequação



2007: Produção de Protótipos



2008: Necessidade de Ampliação

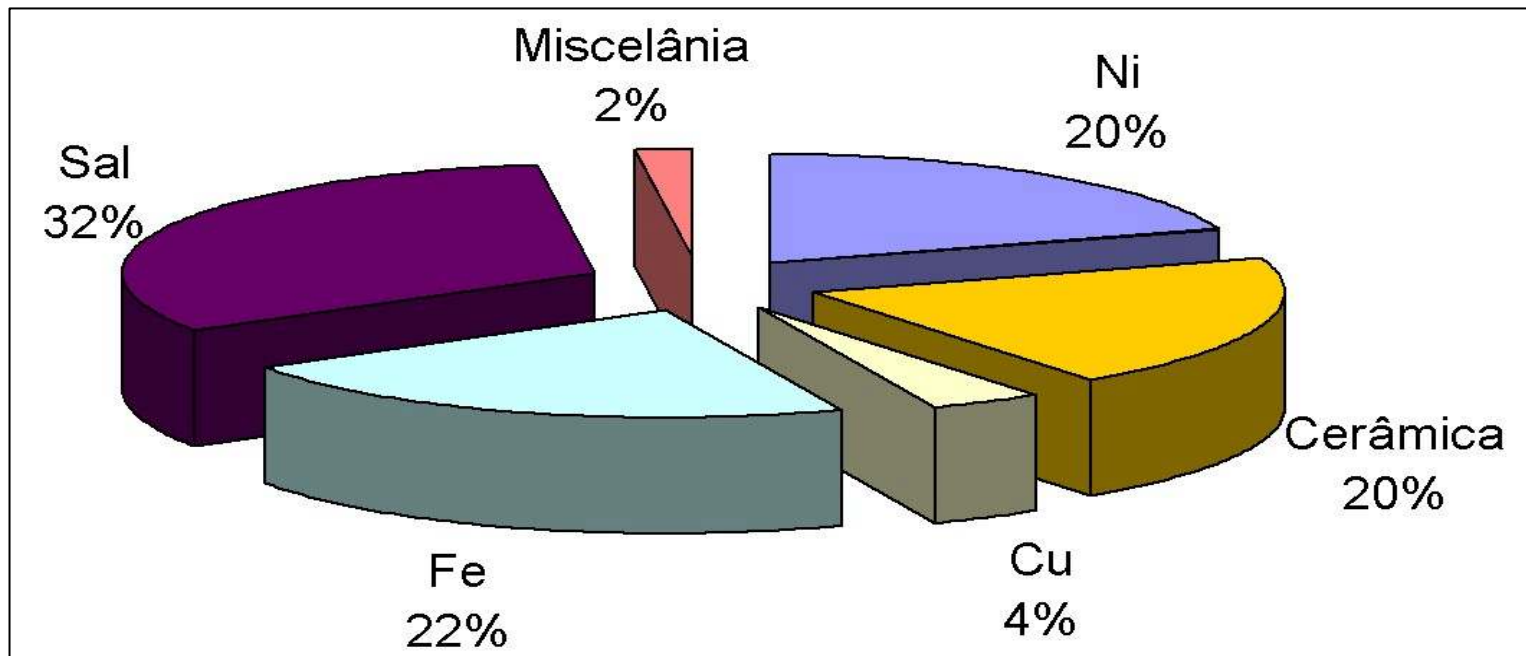
Patrocínio: **ELETROBRÁS**

ZEBRA Battery: Environment and Safety

- Practically **100% recyclable**;
- Metals easily reused in industry;
- Raw materials in abundance on the planet;
- Does not suffer the memory effect (no Habituation to reduced charging);
- **3 times lighter and 30% smaller** than a lead-acid battery;
- Suitable for tropical countries.



Approved in “crash test”
(50 km/h)



Prototypes Developed in Itaipu



Electric Car



Electric Truck

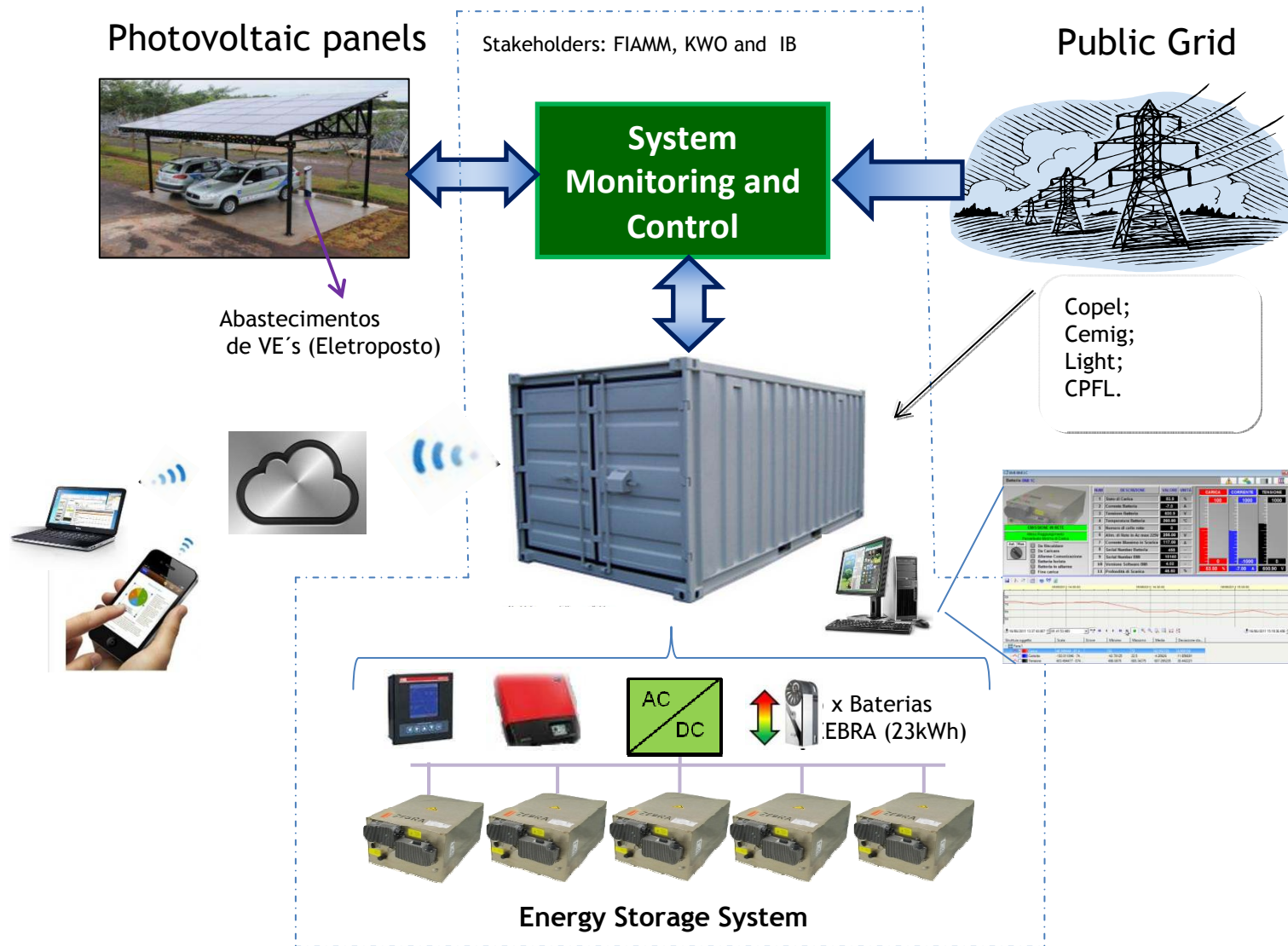


Pure Electric
Mini-Omnibus



Hybrid Electric Plug-In Ethanol Omnibus

System for Fast charge of the EV's



Sodium Stationary Batteries: Proposed Application to the Archipelago of Fernando de Noronha



Energy from ocean wave



4 MWh / 2 MW
80 x 50 kWh (NaNiCl)



Wind Energy



Solar Energy





Thank you

Eng. Celso Ribeiro B. de Novais

E-mail: cnovais@itaipu.gov.br

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