InovGrid Project - Case-study for CBA

Application of EPRI methodology

2nd EU-US workshop on Smart Grid assessment methodologies

Washington DC, 7th November 2011

João Martins de Carvalho
Gonçalo Castelo Branco

EDP Distribuição

Confidentiality and Disclaimer

<u>This document contains privileged and confidential information</u> intended only for the person and entities to which it is addressed. Any review, retransmission, dissemination, copy or other use of, or taking of any action in reliance upon this information by persons or entities other than the intended recipient(s), is prohibited.

EDP shall in no event be liable for any damages whatsoever including, without limitation, indirect, consequential or special damages, such as for loss of revenue, loss of income, or loss of profit, business interruption, or loss of data or loss of information, arising out of the use of or inability to use the information in this report, even if EDP has been advised of the possibility of such damages.

Agenda

1. **EPRI Ten-Step Approach for Cost-Benefit Analysis**
2. **Sensitivity Analysis to Main Variables**
3. **Social Impacts and Externalities**

Ten-step Approach for a Cost-Benefit Analysis (EPRI)

1. Review and describe the technologies, elements and goals of the project
2. Identify the functions/functionalities
3. Assess the principal characteristics of the Smart Grid to which the project contributes
4. Map each function onto a standardized set of benefit types
5. Establish project baselines
6. Identify and compile data
7. Quantify the benefits;
8. Monetize the benefits
9. Estimate the relevant costs
10. Compare costs to benefits

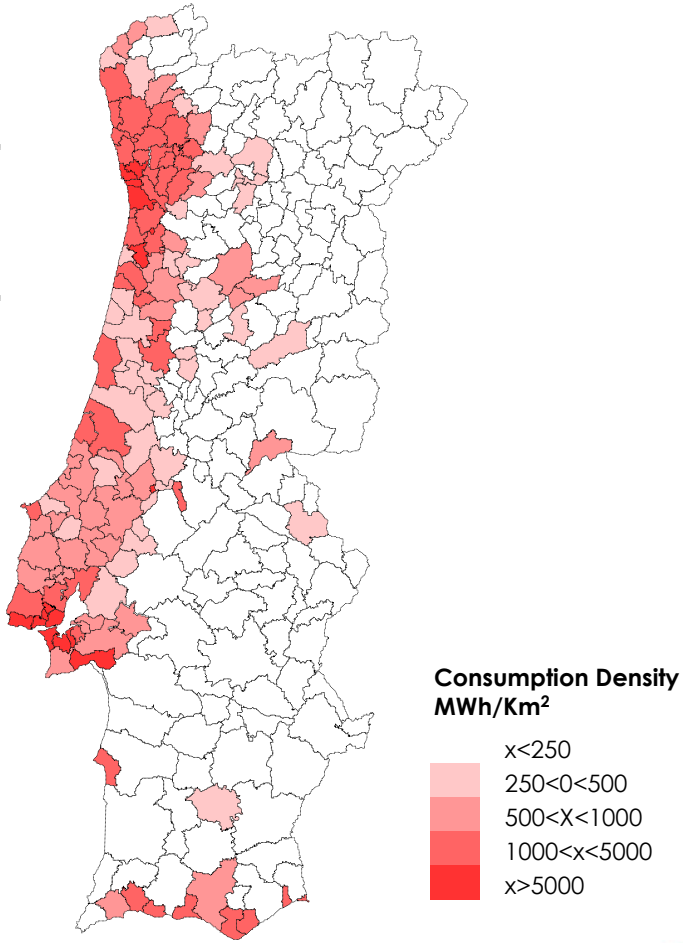
Step 1. EDPD distributes energy to more than 6 million clients, with a network of more than 200.000 Km

1 Step

Energy Consumption Density

In-flow Energy
51,6 TWh

Distributed Energy
47,8 TWh



Main figures 2010:

1.	**Headcounts (#)**	**3.637**
	• External Suppliers	> 7.000
2.	**Assets (€MM)**	**2.469**
	• Substations (#)	404
	• MV/LV Substations (#)	63.223
	• HV/MV Network (km)	83.294
	• LV Network (km)	137.069
	• LV meters (#)	6.149.046

edp distribuição

Step 1. Évora InovCity is a living lab for InovGrid project, with different dimensions from smart metering, Public Lighting, EV, Energy Efficiency and Client interaction

1 Step

Évora is the first InovCity with more than 30k smart meters and 340 DTCs in operation

Évora InovCity has the dimension, the network diversity, the customers and the context to support a thorough evaluation of the solution

Main attributes of Évora pilot:

InovCity store

EV charging points

DTC installed in all secondary substations

Efficiency Case-study with selected Commercial Clients

MicroGeneration integration

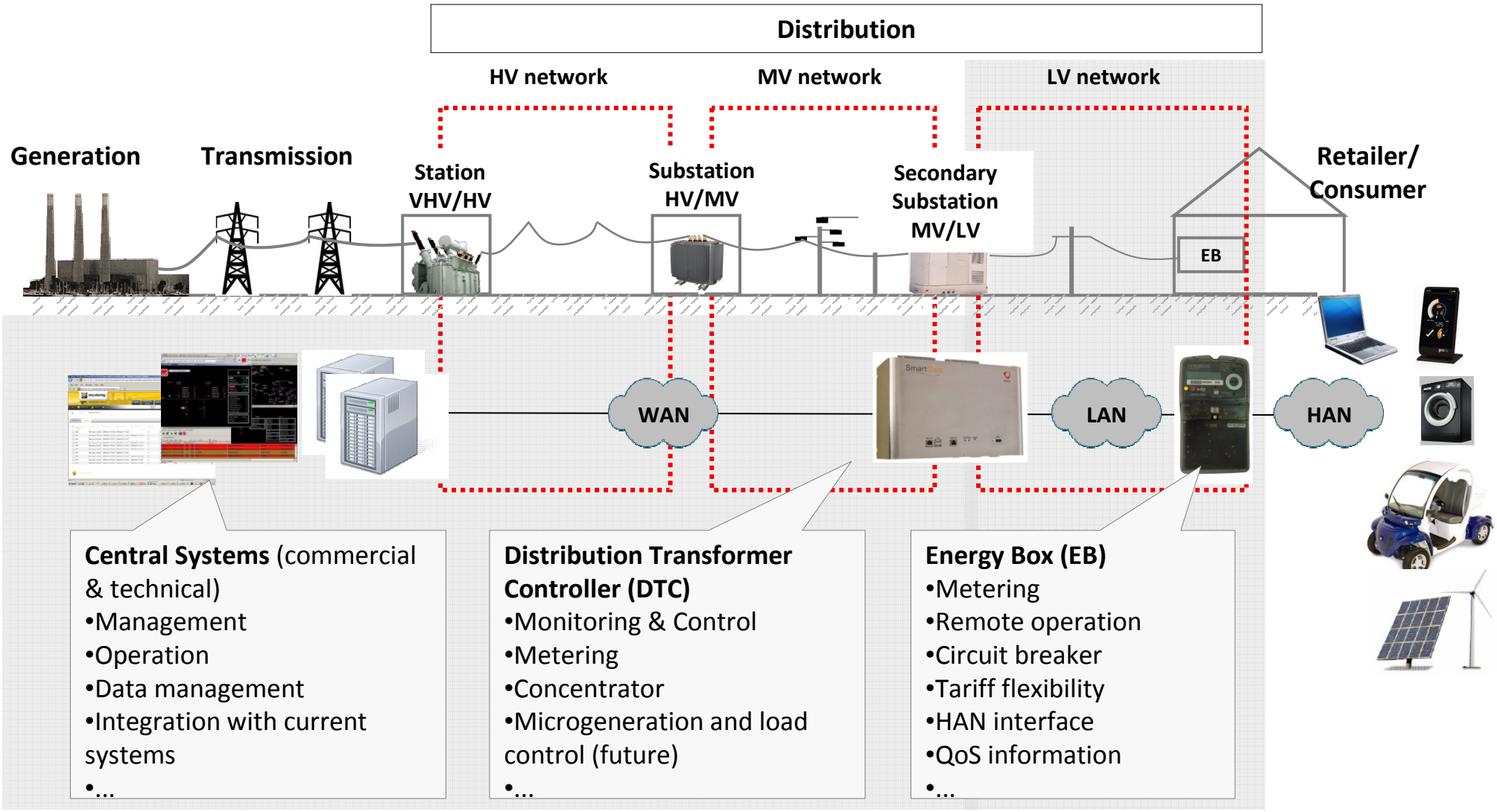
New products and Services to Domestic Clients

Energy Efficiency with Public Lighting

edp distribuição

Step 1. EDP Smart Grid Vision will extend the “intelligence” on the grid to the low voltage network using new equipments and technologies

1 Step



Central Systems (commercial & technical)
- Management
- Operation
- Data management
- Integration with current systems
- …

Distribution Transformer Controller (DTC)
- Monitoring & Control
- Metering
- Concentrator
- Microgeneration and load control (future)
- …

Energy Box (EB)
- Metering
- Remote operation
- Circuit breaker
- Tariff flexibility
- HAN interface
- QoS information
- …

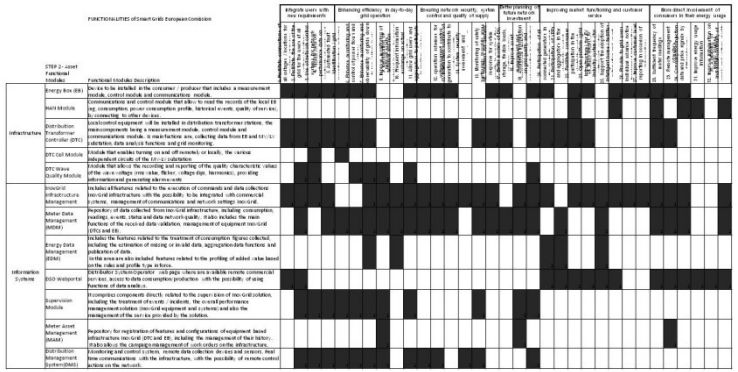
edp distribuição

Step 2-4. Mapping from Assets to Functionalities and Benefits

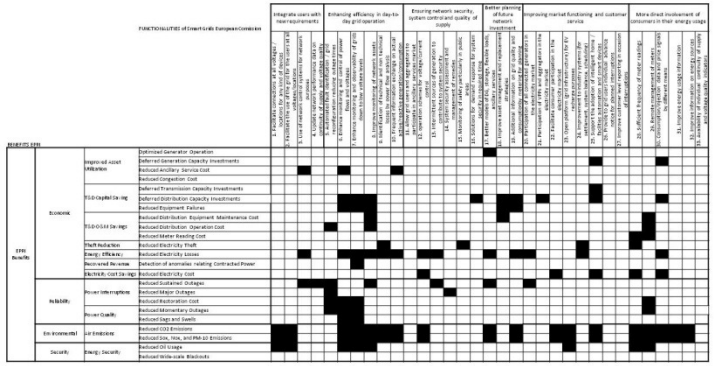
2-4 Step

Assets → Functionalities → Benefits

Step 2



Step 4



Step 3 – Smart Grid characteristics