



MEASURES OF ENERGY EFFICIENCY TO BE MATERIALIZED, IN THE PALACE OF BELÉM, UNTIL THE END OF 2008

1. Energy characterization of the Palace of Belém:

This audit concluded that, in global terms, the Palace of Belém, with its **18,000 m²** area distributed amongst several buildings (Palace of Belém and Residence, Civil and Military Houses, Documentation and Information Centre, General Secretariat), consumes, annually, **471 toe** (tonne of oil equivalent) in thermal and electric energy, emitting **771 tonnes de CO₂**, resulting in annual energy costs of **156,924 €**.

2. Main energy optimization measures to be materialized in 2008:

1. Reduction of **residual usages** in printers, computers, photocopiers and scanners;
2. Tuning of **natural gas boilers**;
3. Insulation of the **central tubes** of the boilers;
4. Replacement and alteration of the operational procedure of the **heating, ventilation and air conditioning systems**;
5. Installation of **shadow structures or protective screens** on the transparent surfaces excessively exposed to solar radiation;
6. Placing **thermal insulation on the roofs** of the buildings;
7. Alteration of window frames and fitting of **double glazing**;

8. Replacing **internal and external lighting** fittings with more efficient devices;
9. Installation of a **Usage Management System in order to monitor** energy consumed in detail;
10. Carry out **sensitivity seminars** on Rational Usage of Energy.
11. Installation of a new **50m2 thermal solar system** for water heating;
12. Installation of a **5 kWp photovoltaic solar system** for electric energy generation;
13. **Change** the electric energy **supply tariff**;
14. Conversion of diesel oil usage to **natural gas**.

Some of these measures have already been carried out in the past weeks, and the remainder will be materialized until the end of the current year, in line with the amounts already included in the **Budget of the General Secretariat of the Presidency of the Republic** for 2008. Due to the resulting savings, these investments (**176,000€**) will have a payback period of **less than 3 years**.

3. Expected results:

With these measures of energy efficiency to be materialized in the Palace of Belém, during the current year, it will be possible to:

- **Reduce energy costs by 62,000€, 40%** less than in 2007;
- **Reduce emissions of greenhouse gases by 228 tonnes of CO₂, 30%** less than in 2007;