

SMART BUILDINGS/SMART SPACES

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INSTITUTO SUPERIOR TÉCNICO



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www.lisboanova.org

Lisbon Energy and Environmental Strategy

- Approved in 2008 by the Municipality, sets more ambitious targets for energy and environmental performance than those set at National and European levels (20/20/20).
- Mile stones coincide with political mandates, reflecting strong political commitment.

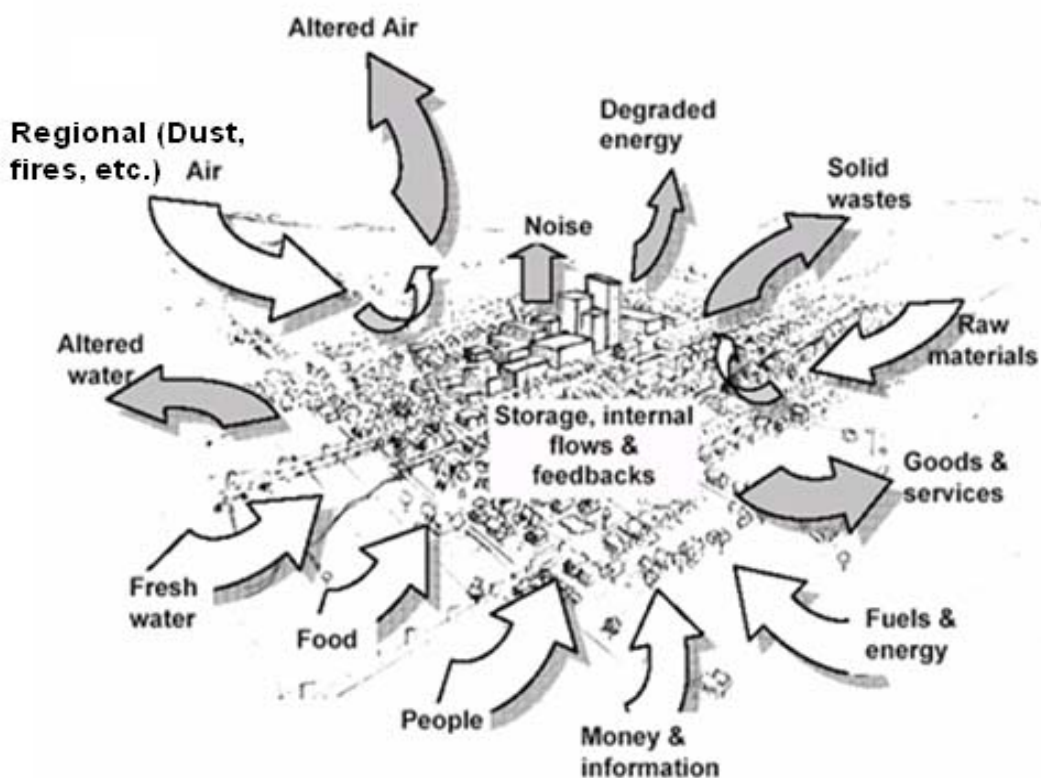


MAIN TARGETS

- Improve Energy Efficiency
- reduce air pollution
- reduce traffic noise
- rationalize energy use in transportation
- Increase green space and soil permeability



Physical Foundations for the Strategy Energy & materials



Physical Foundations for the Strategy

Spatial scale & natural energy flows

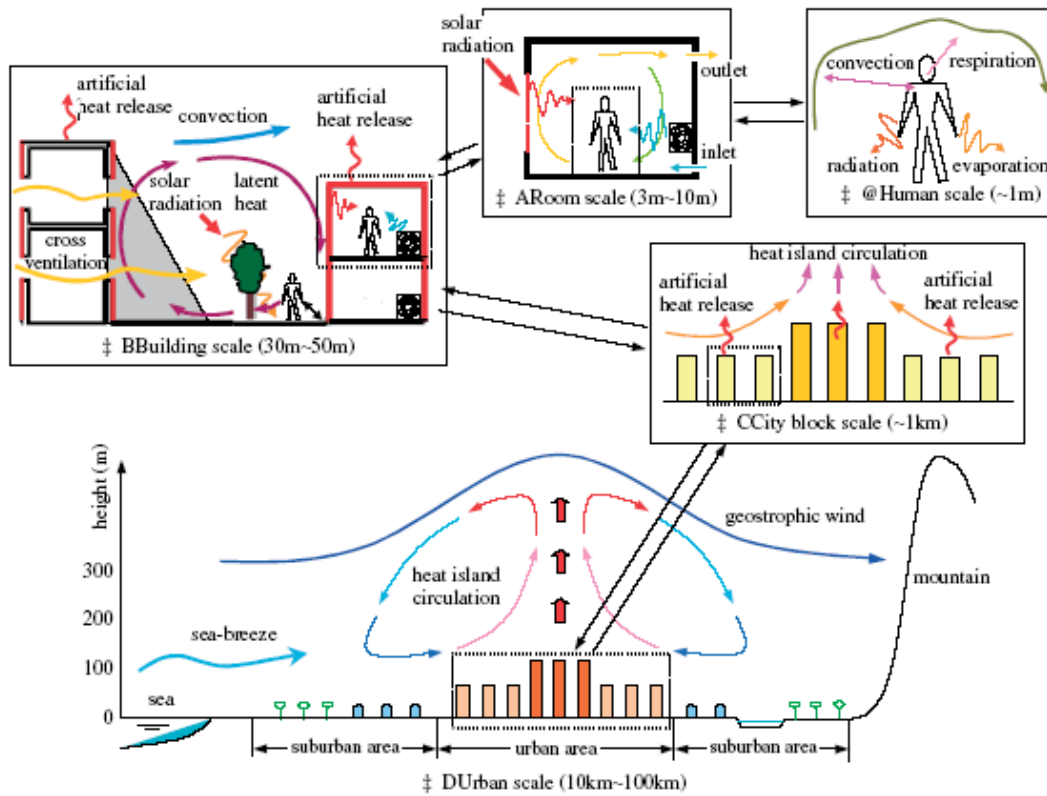
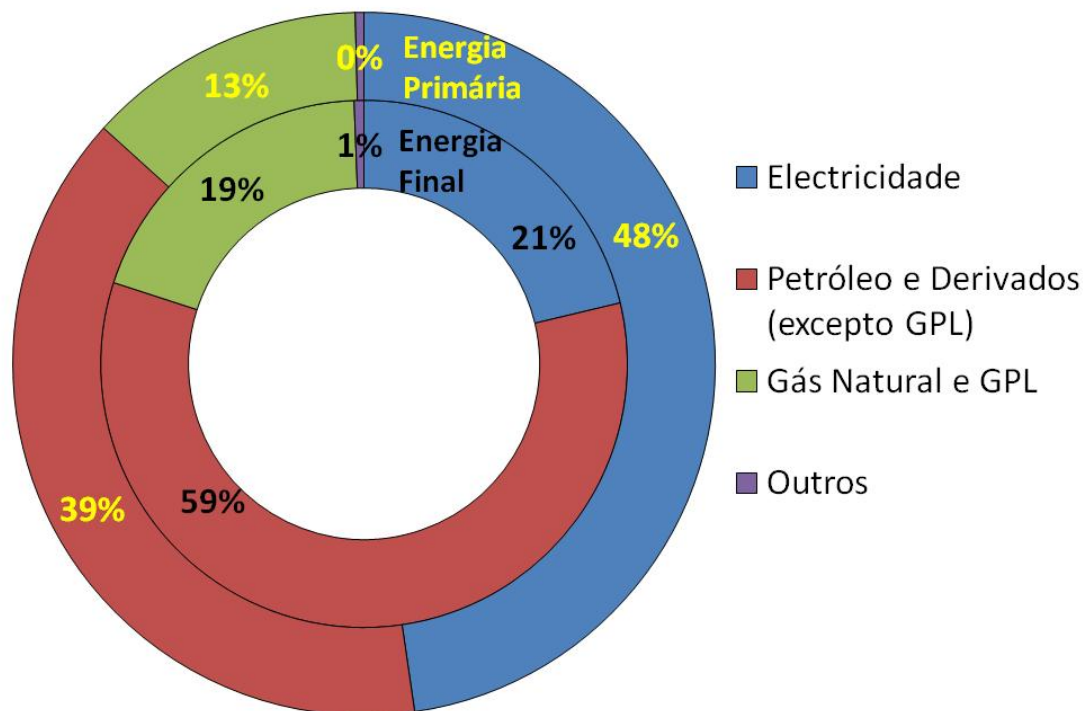


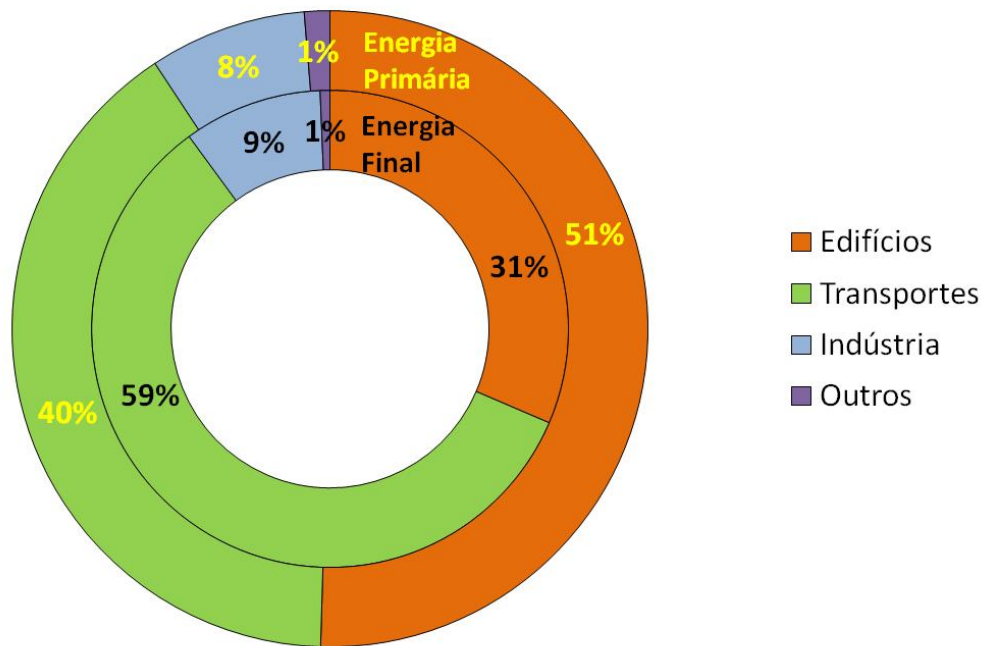
Figure 3. Various scales of phenomena concerned with Urban Climate. This figure is available in colour online at www.interscience.wiley.com/ijoc

Lisbon: Comercial Energy Inputs

Primary & final



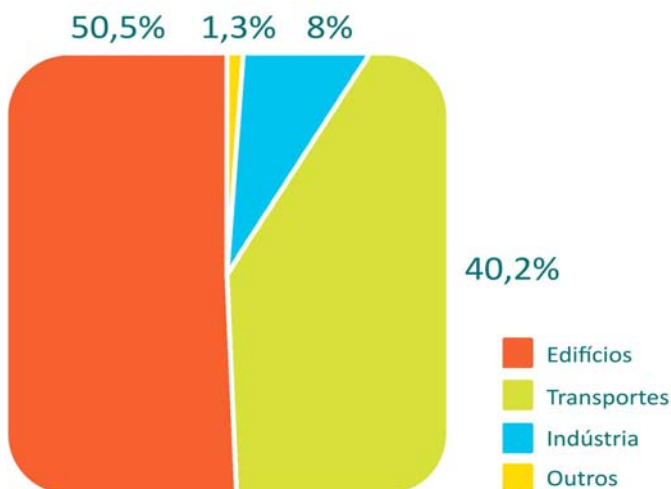
Lisbon: final energy use



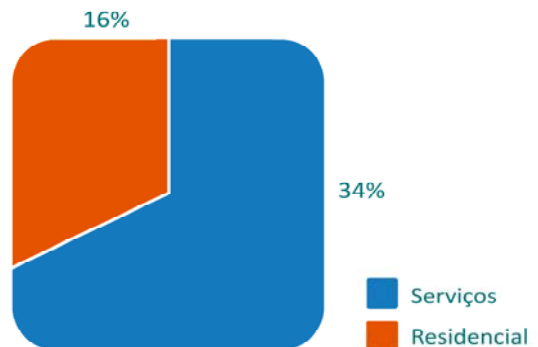
Final Energy use

ENERGY

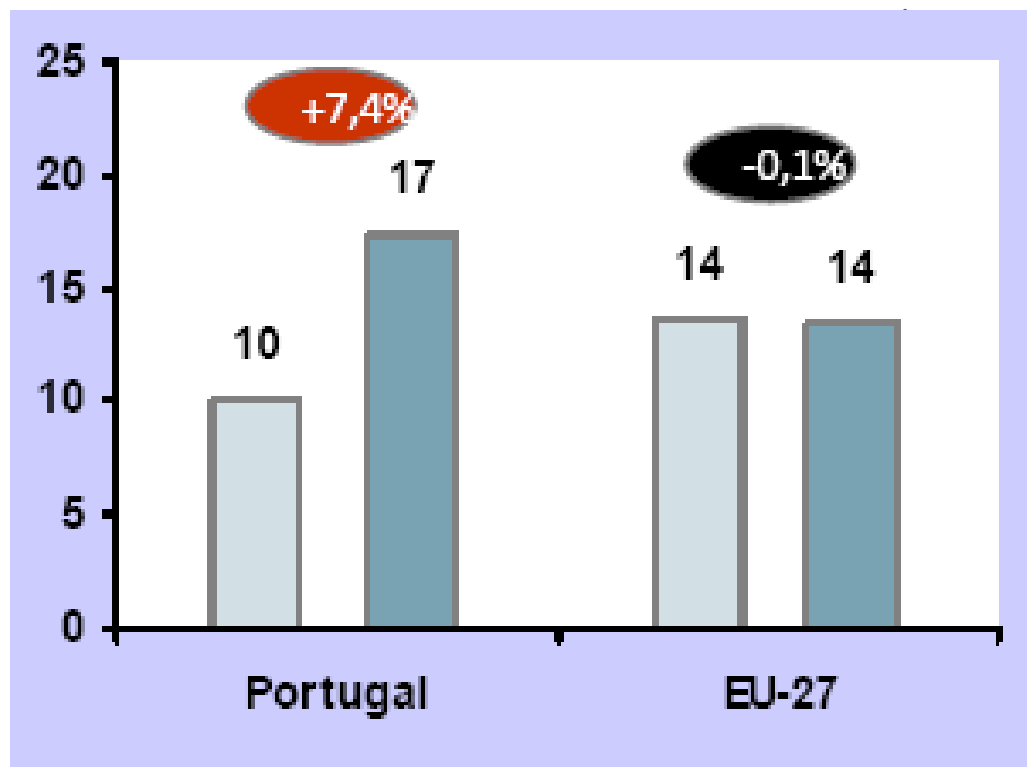
Primary Energy



Share of energy use in buildings



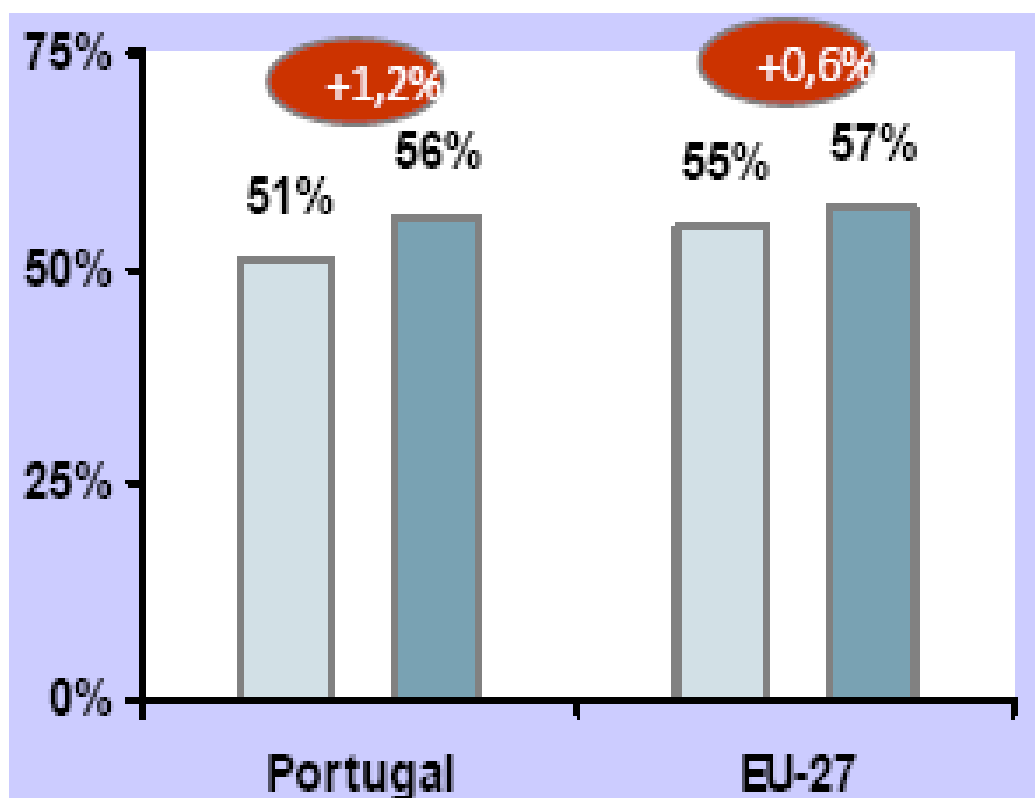
Final Energy Intensity in Services 1997 -2005



Percentage of Services in GDP

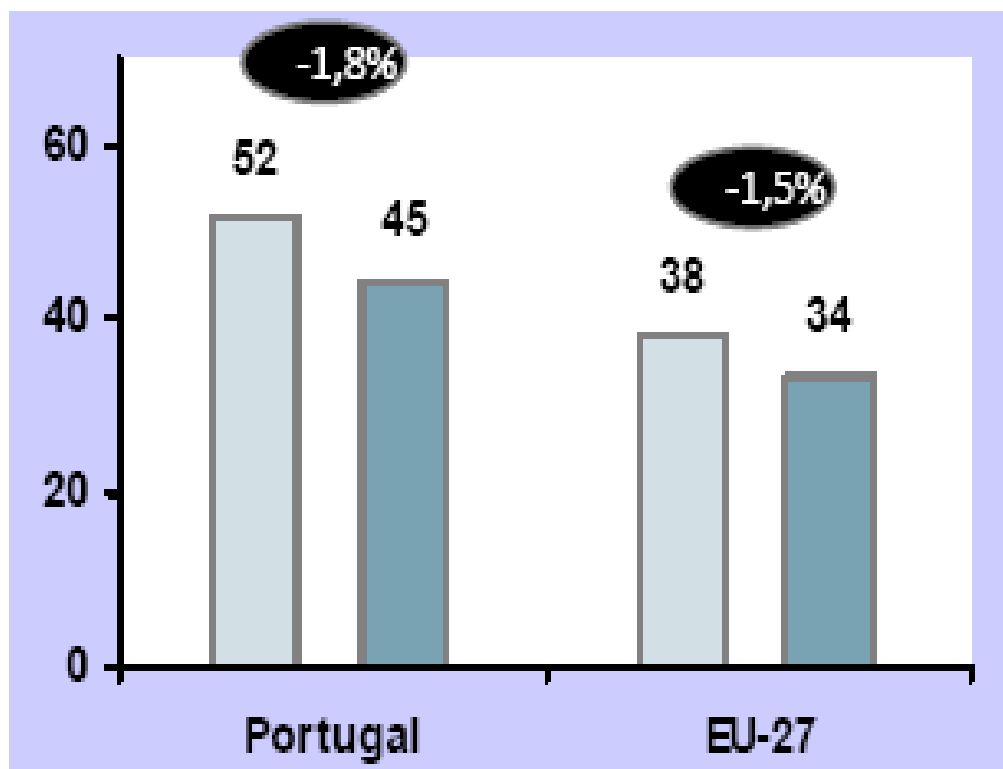
Evolução 1997-2005

Fonte:ADENE/DGEG



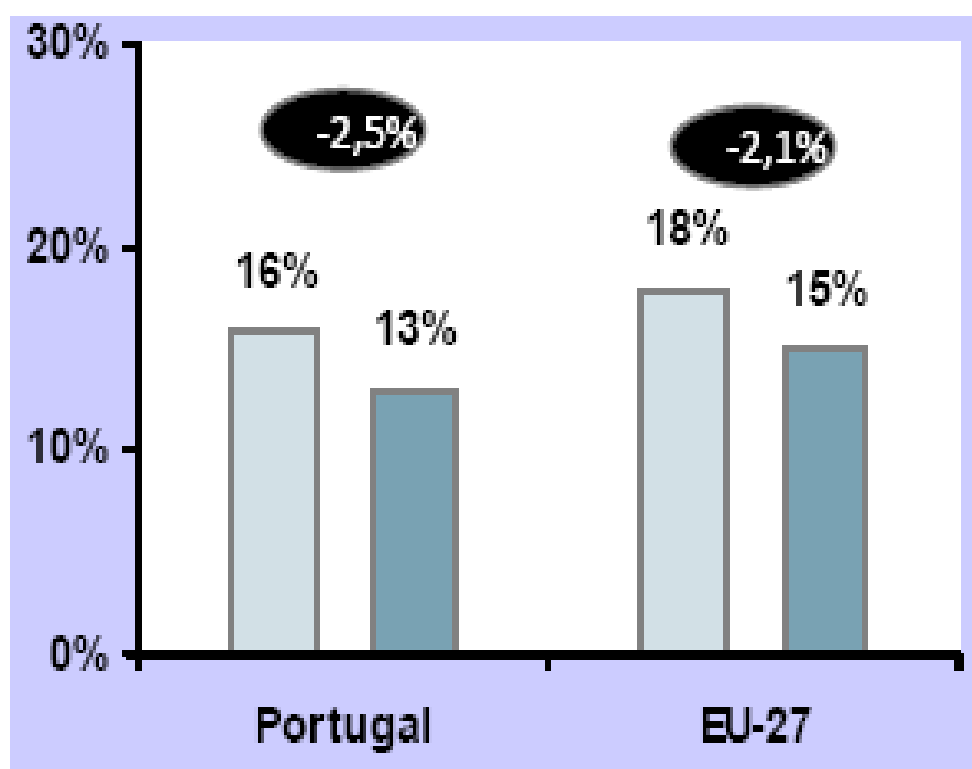
Energy Intensity in Industry

Evolução 1997-2005 (Energia Final) Fonte:ADENE/DGEG



Percentage of Industry in GDP

Evolução 1997-2005 Fonte:ADENE/DGEG



First Priority : Buildings

In Lisbon, buildings are responsible for more than 50 % of primary energy consumption

Service buildings share more than 60% of the energy consumed in buildings due to forced air ventilation and air conditioning.

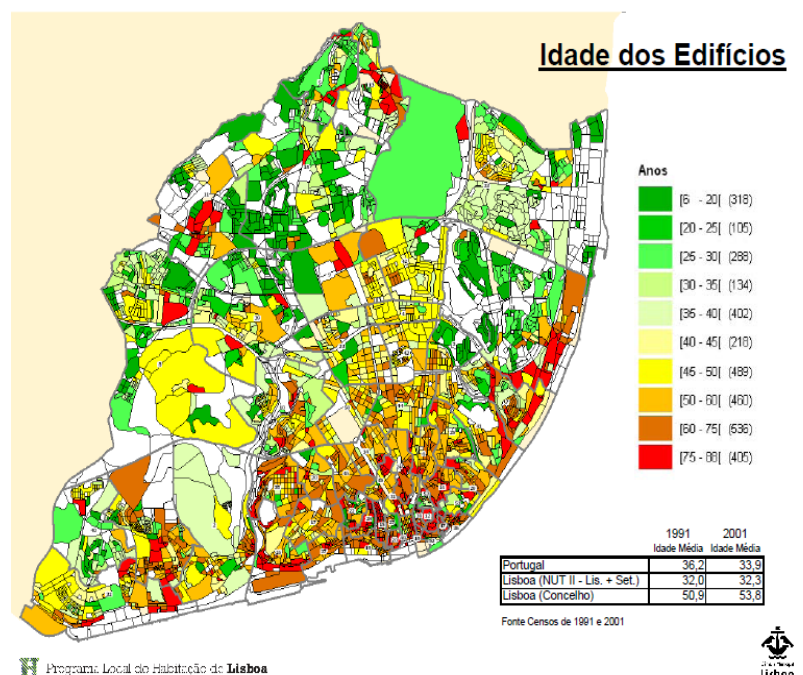
Short term solutions will concentrate on commercial energy efficiency and solar energy, mainly thermal

Medium/long term sustainability requires an urban and architectural design for the Lisbon climate

FIRST PRIORITY : BUILDINGS

According to
Plano Local de Habitação:

- 53.387 buildings in Lisbon;
- 4665 not in use;
- 2705 very bad condition
- 4568 requiring rehabilitation.



Sustainable rehabilitation for Lisbon

Methodology:

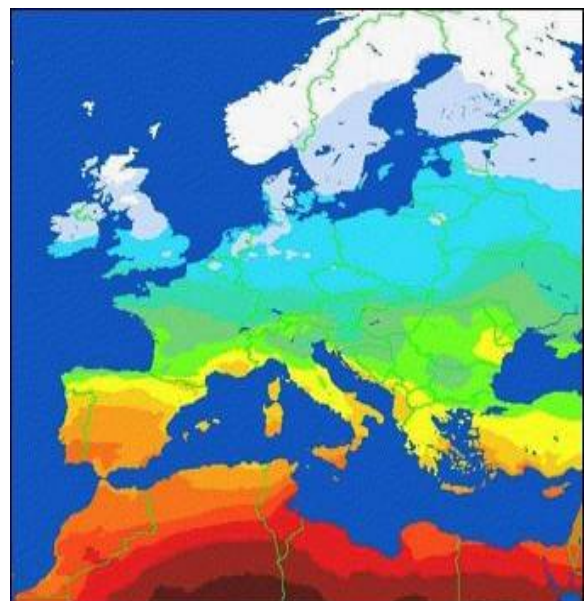
- Identification of 5 typologies of buildings with representative age, type and use.
- Perform a through computer simulation of thermal behaviour with real atmospheric conditions for a base year.
- Access simulation with real energy consumption
- Access economic value of proposed retrofitting solutions
- Publish and diffuse recommended practices



Natural resources : SOLAR ENERGY

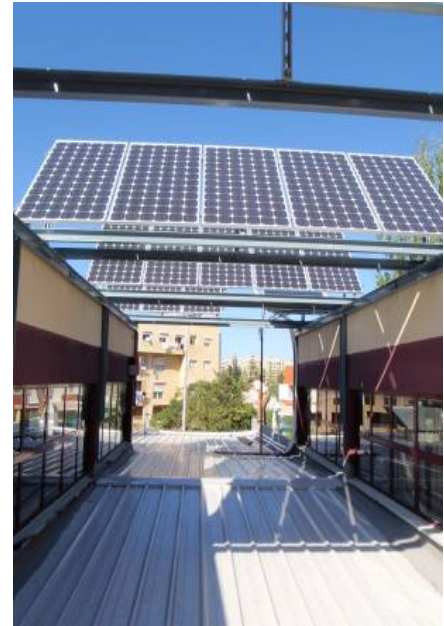
Lisbon has the highest Solar Energy potential in comparison with other European capitals:

- 2800 - 3100 hours of sunlight per year;
- 1400 - 1700 kwh/m²year of solar radiation.



Renewable energy

- The Municipality of Lisbon aims to tap the enormous potential of renewable sources.
- To optimize integration of locally produced energy and help to balance electricity supply and demand. **This will be one of the roles of electrical vehicles which is pioneering;**



Electric vehicles

- **will contribute to:**
 - increase energy efficiency
 - improve local air quality
 - reduce noise levels.
- To maximize these benefits, a wide network of charging points is being implemented across the city (700 charging points available in 2011)
- At the charging point the user is allowed to choose the electricity supplier.

