

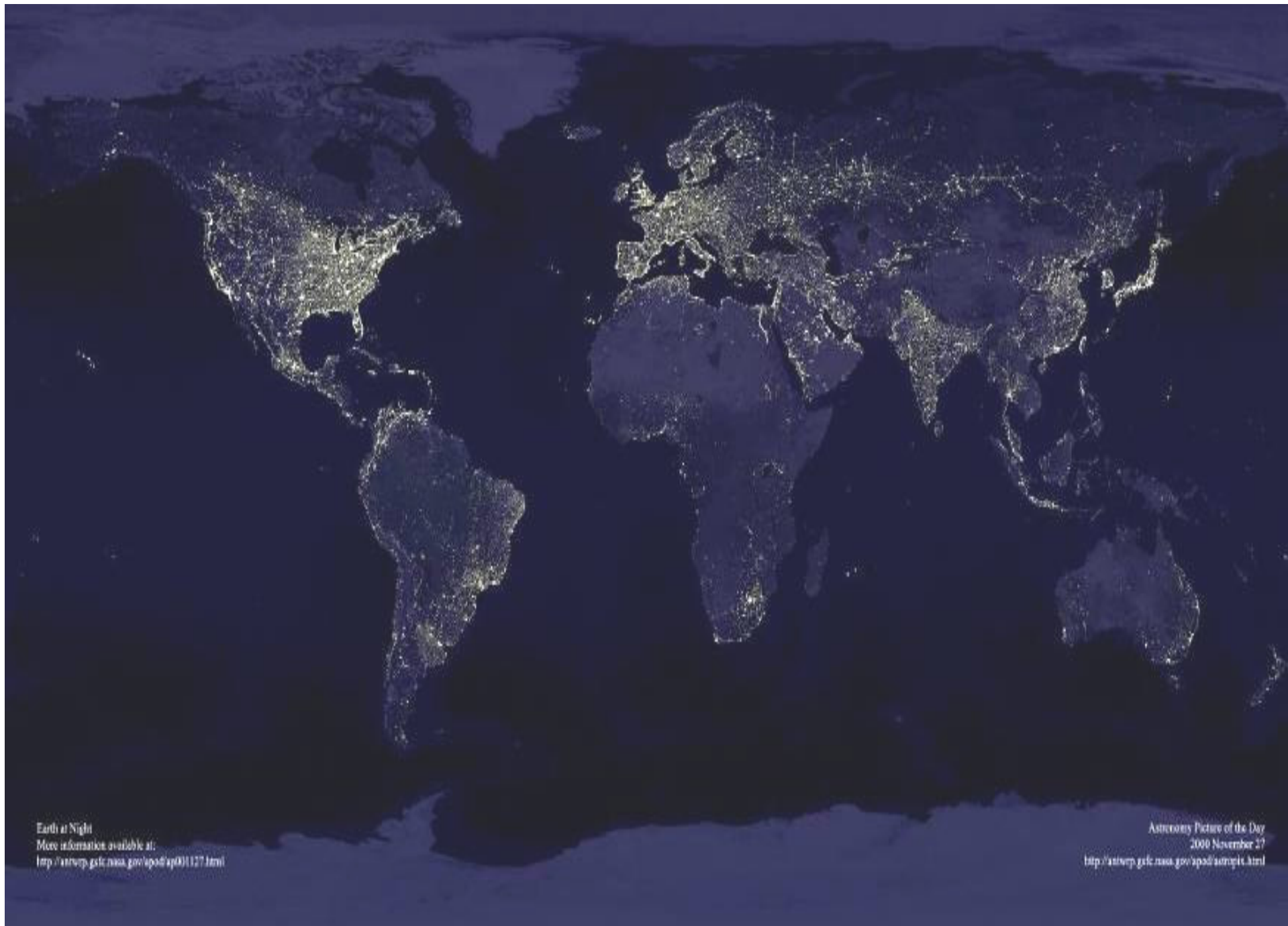
IST



2007



apresentação Lisboa E-nova, 2007 **ARQUITECTURA SUSTENTÁVEL**



Earth at Night  
More information available at:  
<http://anrep.gsfc.nasa.gov/apod/ap001127.html>

Astronomy Picture of the Day  
2000 November 27  
<http://anrep.gsfc.nasa.gov/apod/astropix.html>

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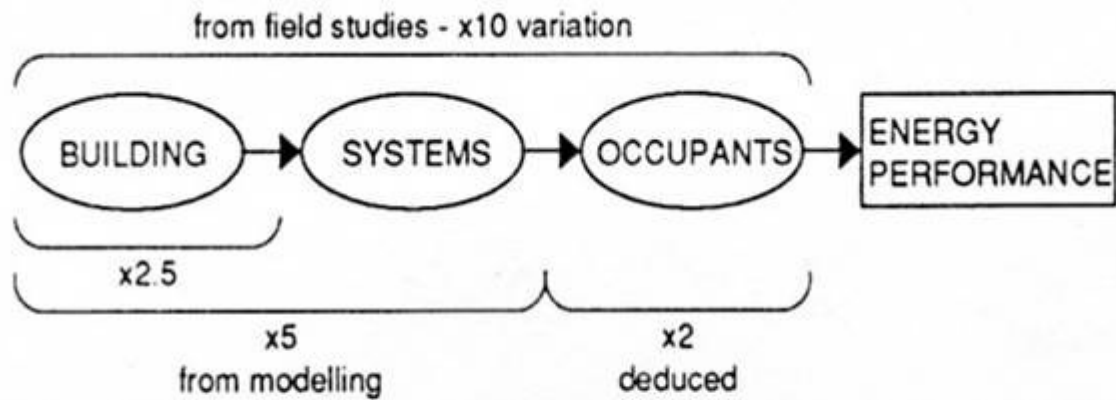


Fig. 17: *Building, systems' and occupant factors affecting energy consumption in non-domestic buildings (from Baker, 1994).*

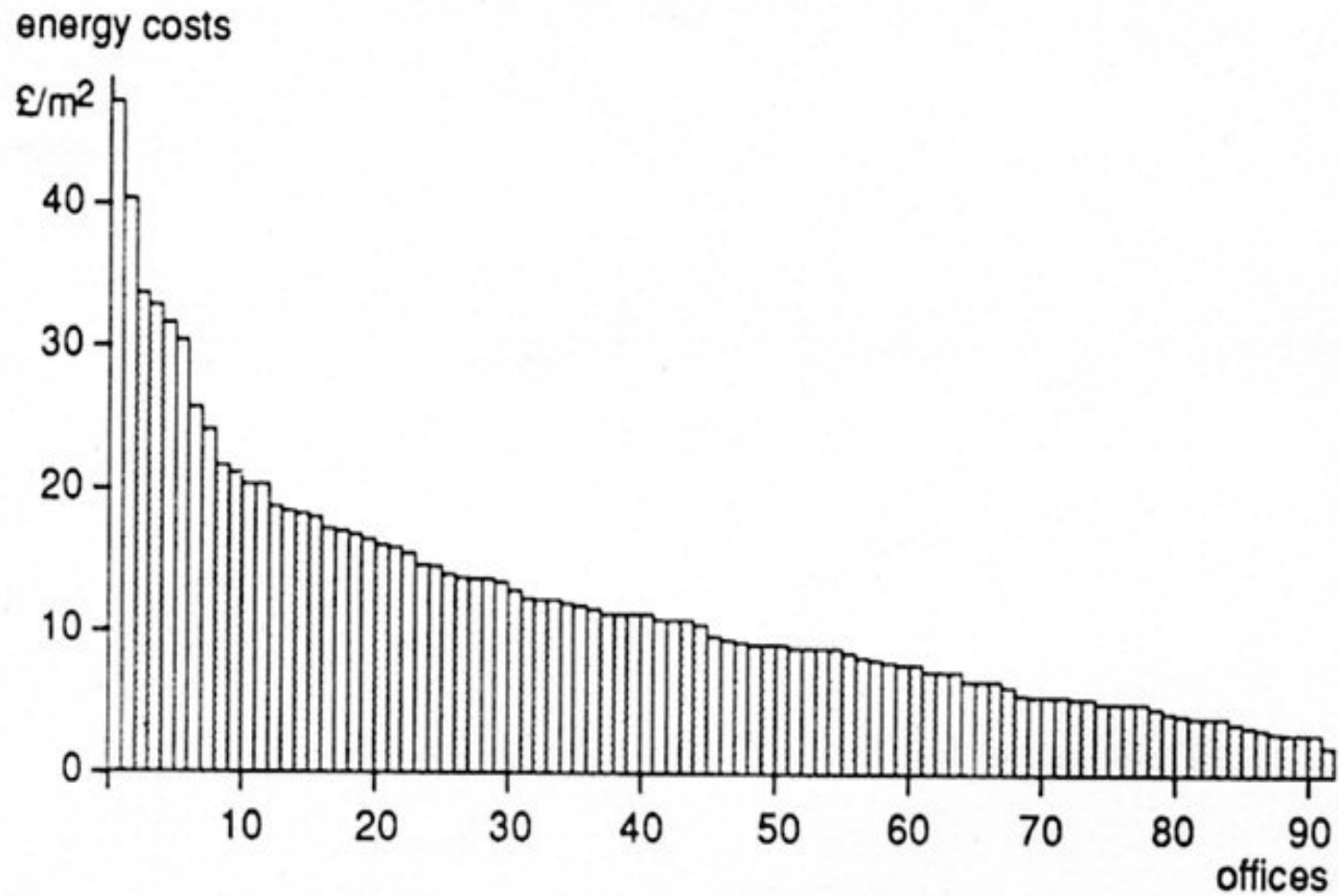


Fig. 16: Annual (delivered) energy costs in 92 individual office buildings (from BRECSU, 1991)

consumo energético em edifícios de escritórios



Figure 1. The south facade of the BRE Environmental Building. External motorized fritted glass louvres can be adjusted to screen out solar gain, or, on overcast days, admit sky luminance. The louvres are controlled automatically to follow the sun's movement.

BRE, UK



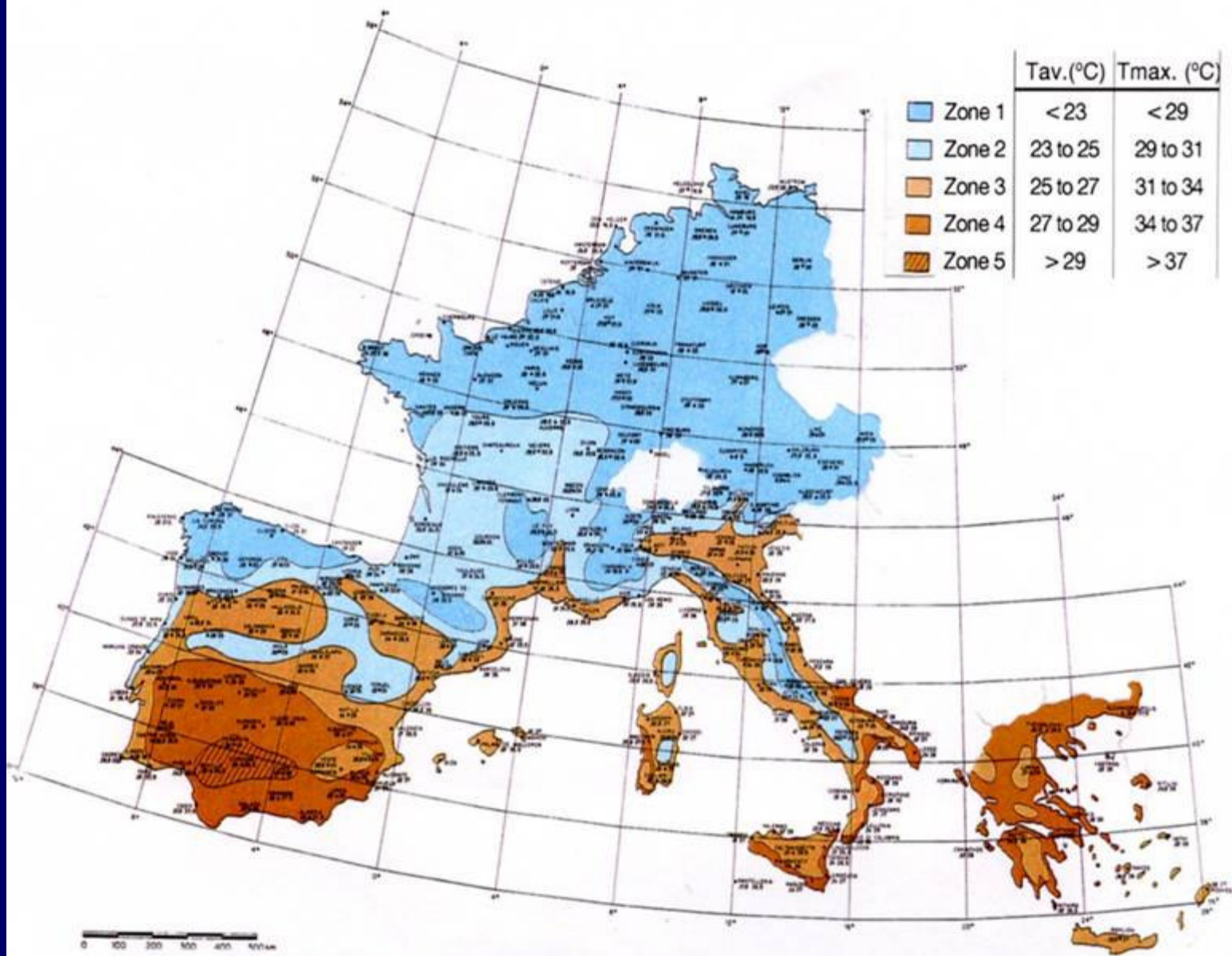
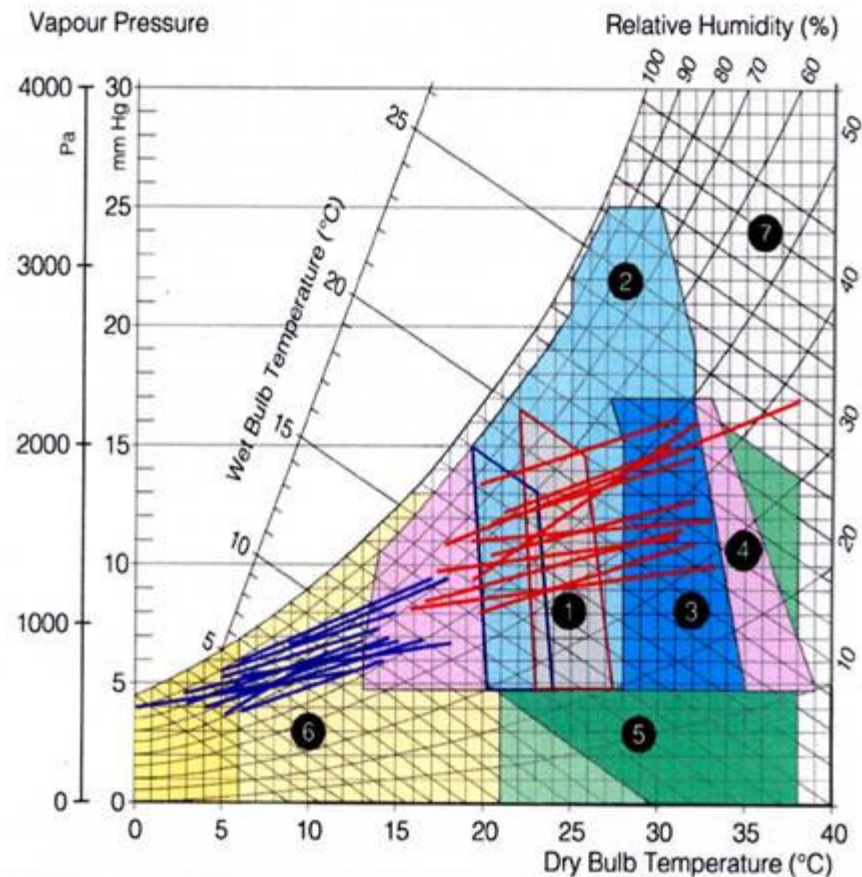


Fig. 23: Summer climatic zones for design reference adopted by UEAtc (UEAtc, 1991)

Summer Temp., E.U.



1. ASHRAE Conventional Summer Comfort zone, used as a standard for air conditioning (ASHRAE, 1995). The area within the blue line corresponds to the winter comfort zone.
2. Zone of influence of daytime ventilation.
3. Zone of influence of night ventilation.
4. Zone of influence of thermal inertia. Includes zones 2 and 3, below 17mmHg vapour pressure.
5. Zone of influence of evaporative cooling (dark green) and humidification (light green). Evaporative cooling can also be used in zones 2, 3 and 4, for Dry Bulb Temperatures higher than 21°C, and Wet Bulb Temperatures lower than 22°C.
6. Passive heating zone (light yellow) and active heating zone (dark yellow). Passive heating can also be used in zones 2 and 4, for Dry Bulb Temperatures lower than 21°C.
7. Zone where air conditioning is required.

Fig. 84: Psychrometric chart showing how ASHRAE's conventional summer comfort zone could potentially be enlarged through the use of various passive cooling techniques. The chart also shows the climatic characteristics of 11 southern European cities: Marseille, Milano, Roma, Napoli, Palermo, Faro, Lisbon, Barcelona, Seville, Madrid, and Athens. The climatic characteristics for each city are represented by the red lines for the hottest typical summer Month (July) and blue lines for the coldest month (January). Climatic data was obtained from the Climatic Data Handbook for Europe (EC, 1992b) and METEOTEST (1997). The various zones presented in the chart were defined by Givoni (1969).

Givoni



Buckminster Fuller, Manhattan Dome, 50's

