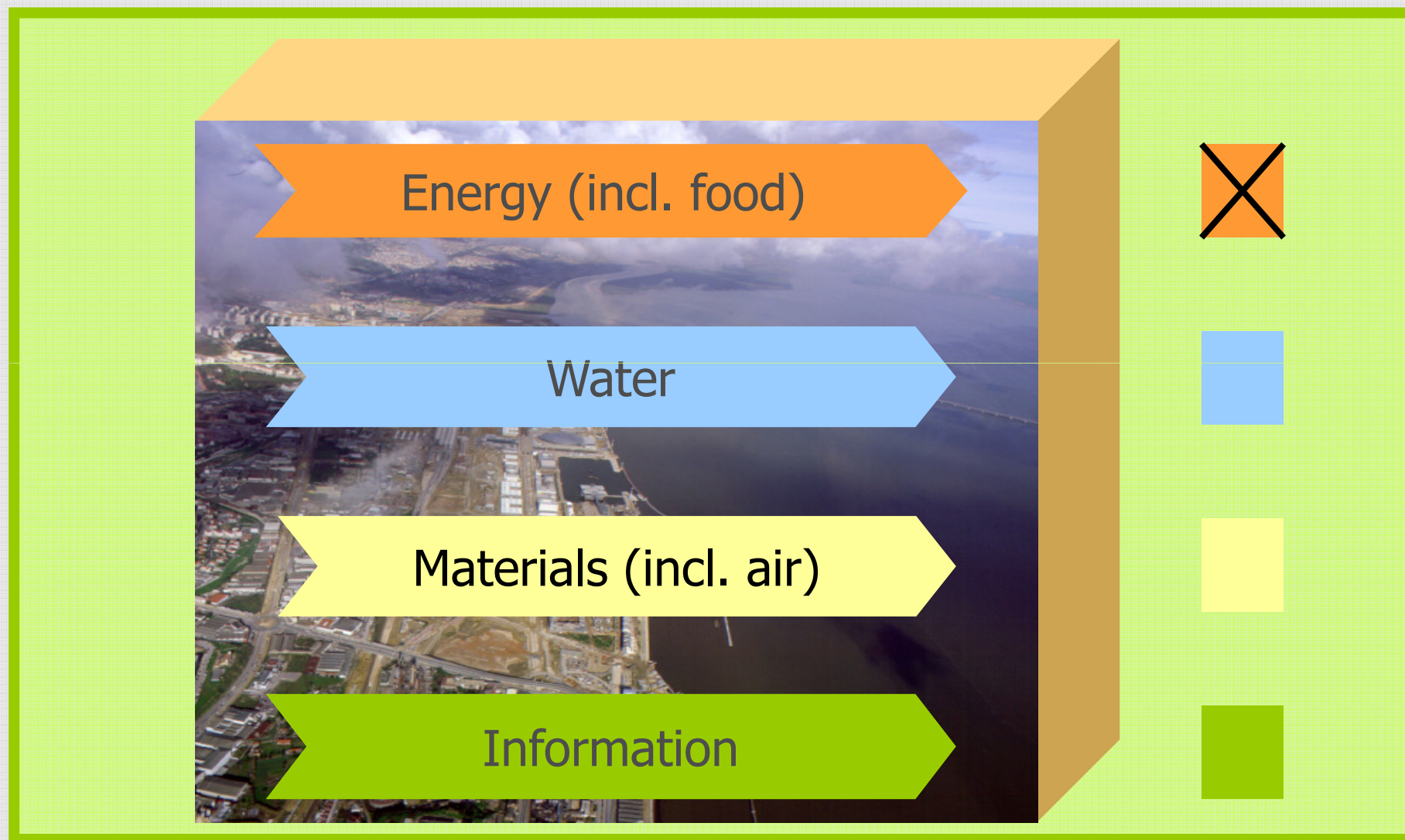


Source: IEA

1. Energy and Sustainability
- 2. Cities can not be sustainable**
3. Cities as energy systems
  - i. Case study of Parque Expo'98 – Lisbon
  - ii. Case study of Porto – 2007 - ...
4. Conclusion

## Resources management in the urban space



# Primary energy vs final: CO<sub>2</sub> impact

	Ton CO <sub>2</sub> /capita	GJ/capita	Ton CO <sub>2</sub> /TJ
Vaxjo	3,8	101,8	37
Stockolm	3,9	95,9	41
Malmoe	4,9	105,0	46
Victoria-Gasteiz	6,4	102,0	63
Porto	5,5	85,3	64
Bizcaia	6,4	101,2	64
Pori	11,7	165,7	70
Burgos	8,0	115,0	70
Barcelona	2,8	38,6	71
Parma	8,4	103,6	81
Pavia	6,0	71,2	84
Tampere	8,1	94,8	85
Ancona	6,3	73,1	86
Provincia Torino	7,6	87,1	87
Verbania	8,6	97,1	89
Maribor	8,4	93,7	90
Nord Milano	8,8	89,8	98
Catarina	5,0	49,9	100

The Greenest City in Europe  
Baltic Cities Award 2007



CO<sub>2</sub>

City of Växjö received Sustainable Energy Europe Award 2007 during the European Sustainable Energy Week.

Fossil Fuel Free Växjö is an overall programme initiated by the City of Växjö to reduce human impact on the global climate change. In 1996, Växjö politicians decided unanimously to strive towards a fossil fuel free municipality. The share of renewable energy is now over 50%.

**The nature of the primary energy is critical!**



1. Energy and Sustainability
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## How much green is 'grey'?

Lisboa EXPO 98 : from a derelict area to an energy efficient city



350 ha

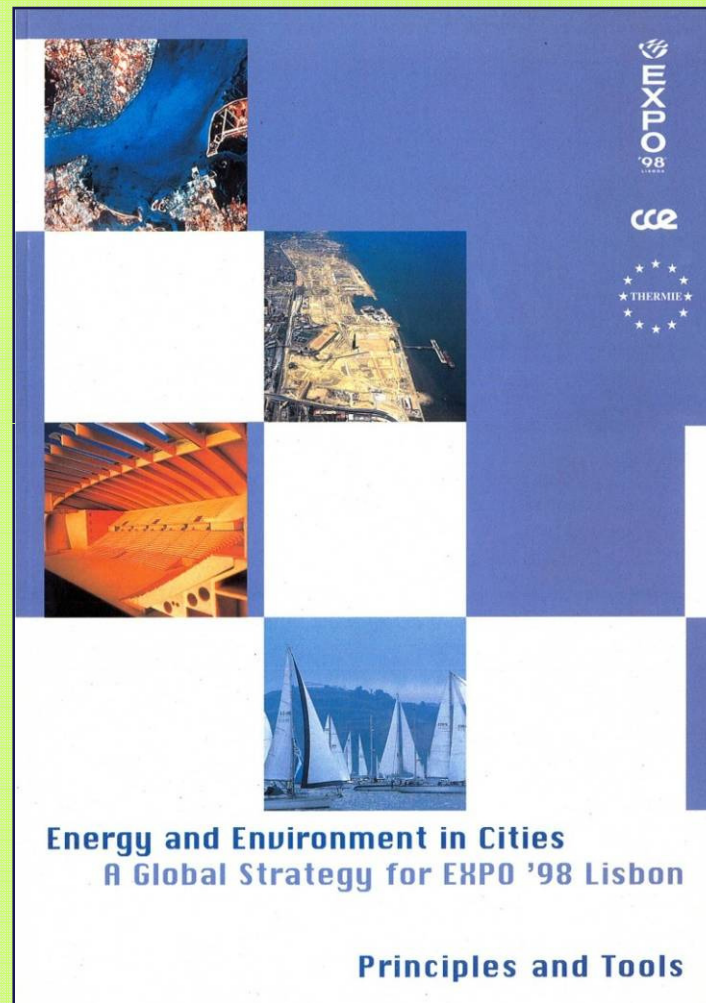
up to 50 000 inhab

1993 - ...



**AdEPORTO**  
AGÊNCIA DE ENERGIA DO PORTO

# EXPO'98: Sustainable City?

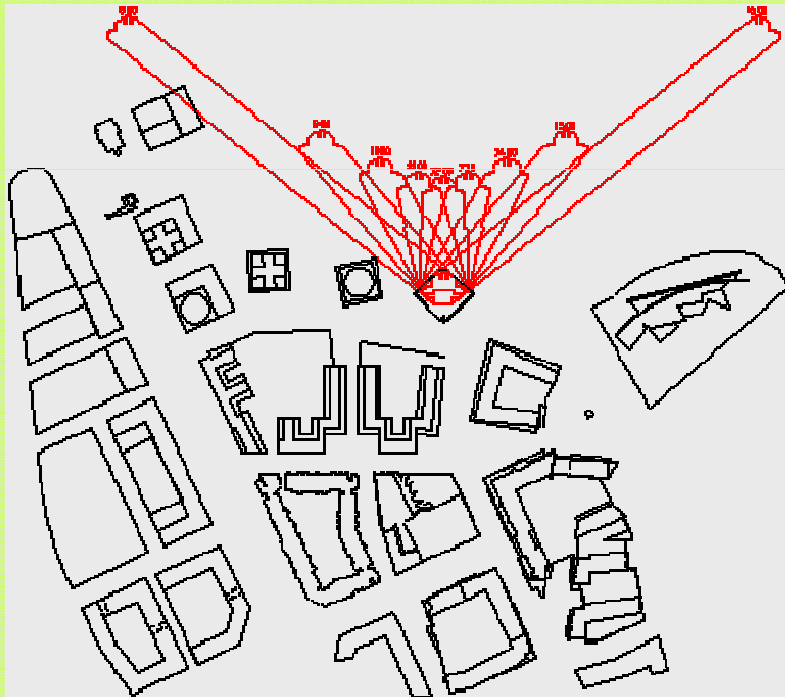


Energy Management Agency

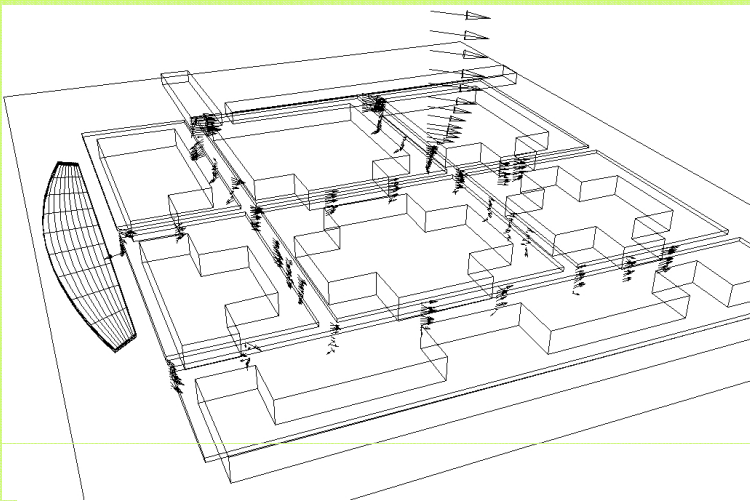
Intelligent Energy  Europe



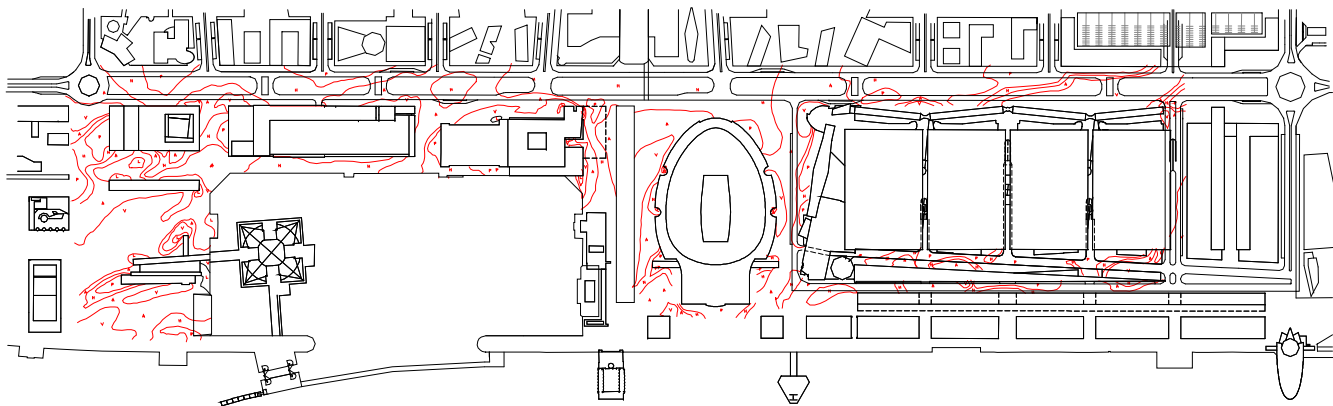
Studies of climate and microclimates: radiation on urban spaces







**Ratio between the wind speed at the site of interest and in the open field. The vertical profile and height of reference of the latter is standardized. Correlates to indices of Beaufort and comfort.**



Source:  
Parque EXPO'98 e  
ADAI/U.Coimbra

Goal on the thermal quality performance of buildings:

To double the regulatory requirements (RCCTE DL 40/90) for winter & summer

