

# **Local Climate Plans and the Role of Cities:**

## **The need for structured targets and methodologies**

Patrick Criqui,

Task Force on Climate Change  
and the Role of Cities

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# The relevance of the local level

- ◆ The local level of organization and policy is indeed important for three main reasons:
  1. *Density and spatial organization are key factors explaining energy consumption in transport (Newman and Kenworthy) and buildings*
  2. *Some of the major potentials for emission abatement need local coordination to overcome transaction costs (e.g. thermal retrofitting)*
  3. *Pervasive climate policies have to imply other actors than states, enterprises and individuals: the intermediate institutions have a particular role to play (civil society)*

# Three levels in cities commitment

- i. Adopting « Mesurable, Reportable and Verifiable » commitments  
(=> measurement system)
- ii. Introducing cost-effectiveness in the design of the Local Climate Plans (LCPs)
- iii. Addressing the finance problem through taxes (national or local ?) or participation in an ETS

# Local Climate Plans and the Role of Cities

- ◆ Building targets in a MRV framework
- ◆ Implying the intermediate institutions
- ◆ Margins for freedom at local level
- ◆ Methodologies for cost-effectiveness
- ◆ Issues to be urgently addressed

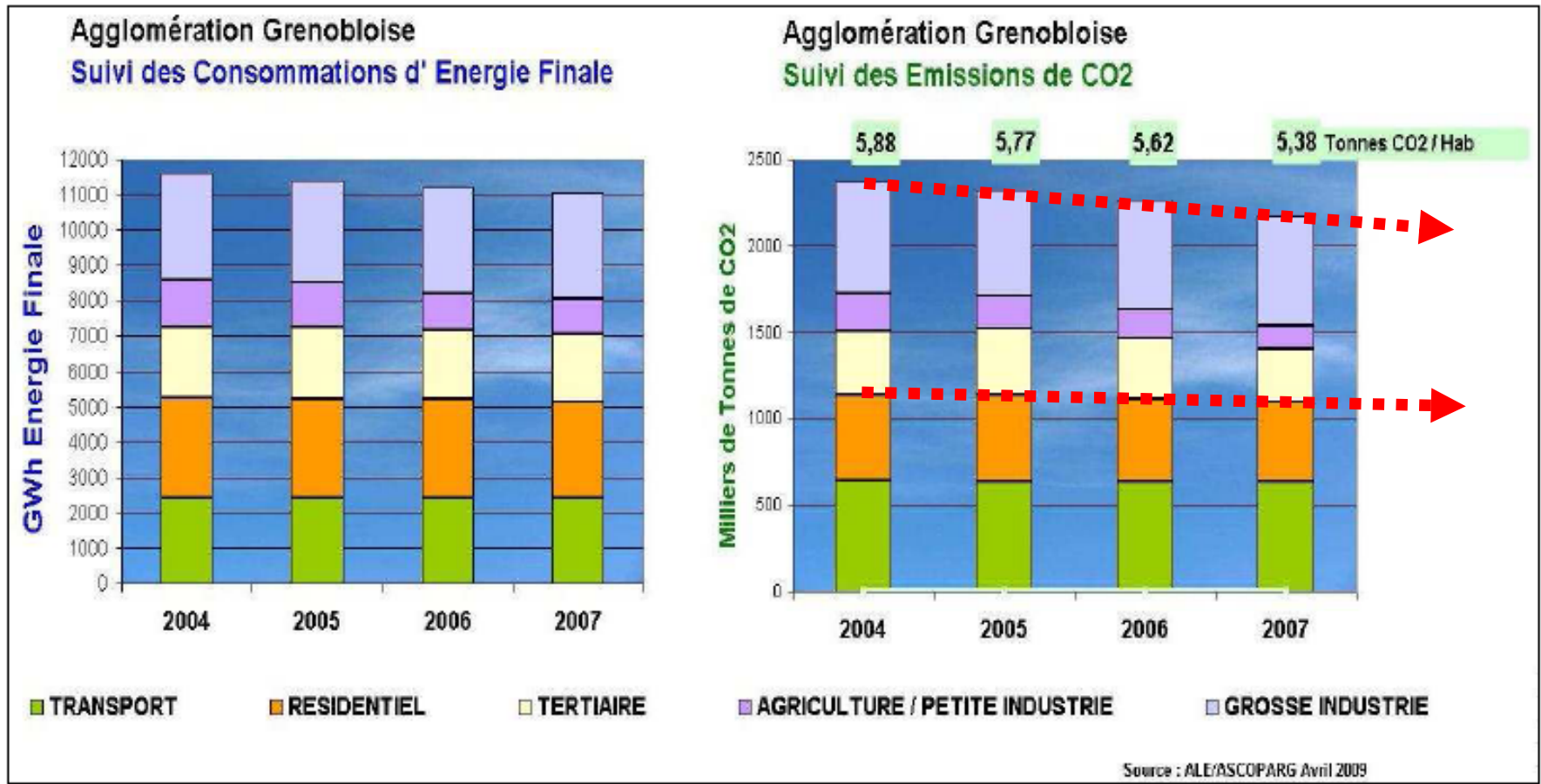
# The accounting tool issue

- ◆ Accounting systems based on generic indicators (cf. the Bilan Carbone in France) are adequate for strategic analyses and decisions, but not for MRV approaches
- ◆ La Métro (metropolitan area of Grenoble) has developed an « Observatory of the LCP » based on two combined methods:
  - An energy balance approach at the metropolitan area level
  - A « cadastral approach » with a localized inventory of activities

# The perimeter issue

- ◆ Should the emission take into account the emissions:
  - ***Of*** the community institutions
  - ***On*** the territory *of* the community
  - ***For*** the activities *on* the territory *of* the community ?
  
- ◆ Should the perimeter include emissions of intensive industries and in particular ETS-capped industries ?
  
- ◆ Answers to these questions should consider the social dimension (cf. Caterpillar in Grenoble) ... and the consistency with the national level

# Trends in energy consumption and emissions as from the Grenoble-La Métro LCP Observatory



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# The role of intermediate institutions

- ◆ The LCP of La Métro promotes climate action on the territory of the Grenoble metropolitan area. It is organized at two level:
  - Global targets for emission abatement in a long term Factor 4 perspective
  - A convent with commitments for the partners
- ◆ Aside the Observatory, a Scientific Council has been introduced to guarantee the quality of methods and analyses

# The global targets

- ◆ The global objectives are defined in terms of emission reductions and contribution of local renewable to total consumption

	2005 année de référence des objectifs nationaux	2007 dernières stat. disponibles	2014 objectifs PCL	2020 objectifs PCL
<b>Émissions de CO2</b>	Année de référence	-6,40%	-14% minimum	-20% minimum
<b>Consommation d'énergie</b>	Année de référence	-5,30%	X%	X%
<b>Part des énergies renouvelables</b> (production ENR totale / consommation totale)	Données inconnues	7,90%	X %	17%
> part de l'électricité renouvelable		20,80%	X	24%
> part de la chaleur renouvelable		6,40%	X	28%

# 68 partners in 2009

- ◆ **Local authorities** : Métro, SMTC, CG38, 25 communes, CNFPT
- ◆ **Social developers** : ACTIS, OPAC 38, Pluralis, SDH, Grenoble Habitat
- ◆ **Energy and water suppliers** : Cie de chauffage, EDF, GDF, GEG, SIERG
- ◆ **Universities and Research** : UPMF, UJF, Ecole d'architecture, INPG, Rectorat, CSTB
- ◆ **Associations** : MNEI, FRAPNA – Isère, CLCV, AGEDEN, ALE
- ◆ **Actors in local development** : AURG, CAUE, SEM-SAGES
- ◆ **Distribution companies** : Leroy Merlin, Innovallée, SAMSE
- ◆ **Banks** : Banque populaire des Alpes, Caisse d'Epargne des Alpes, DEXIA
- ◆ **Others** : Alpexpo, ONF
- ◆ **Other non-local institutions** supporting the LCP : Région Rhône-Alpes, ADEME...

# The partner's commitments

- ◆ The partners should consider GHG emissions in all their decisions, adopt targets for their own emissions, consider energy sobriety as a priority and take into account adaptation measures
- ✓ prendre en compte le critère « émissions de gaz à effet de serre » dans l'ensemble des décisions qu'ils sont amenés à prendre ;
  - ✓ se fixer un objectif chiffré en terme de réduction de leurs émissions directes de CO<sub>2</sub> d'ici 2014 ;
  - ✓ considérer la sobriété énergétique comme la priorité de leur stratégie énergétique, en se fixant un objectif chiffré en terme de réduction de leurs consommations d'ici 2014 ;
  - ✓ intégrer des mesures d'adaptation au changement climatique dans leurs actions d'aménagement

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# A challenge for research

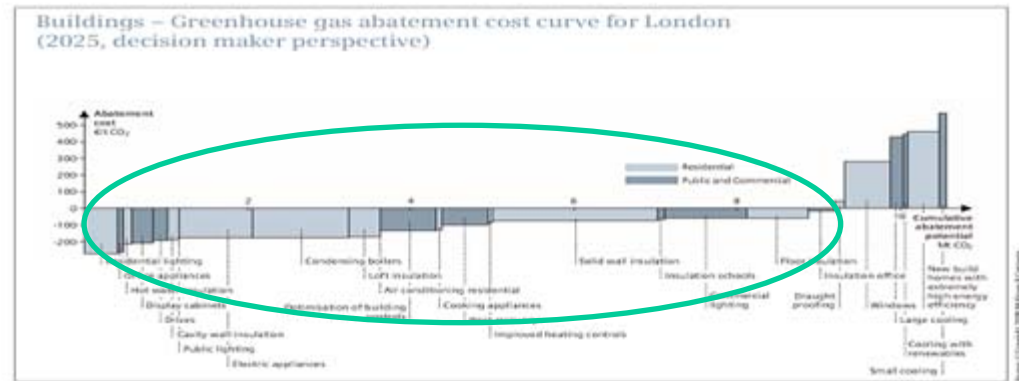
- ◆ Local Climate Plan have to combine consistently:
  - Incremental changes through the introduction of Very Low Emission Vehicles and Very Low Energy Buildings
  - Systemic innovations in urban design, networks and transport systems

# The SIEMENS-McKinsey study for London

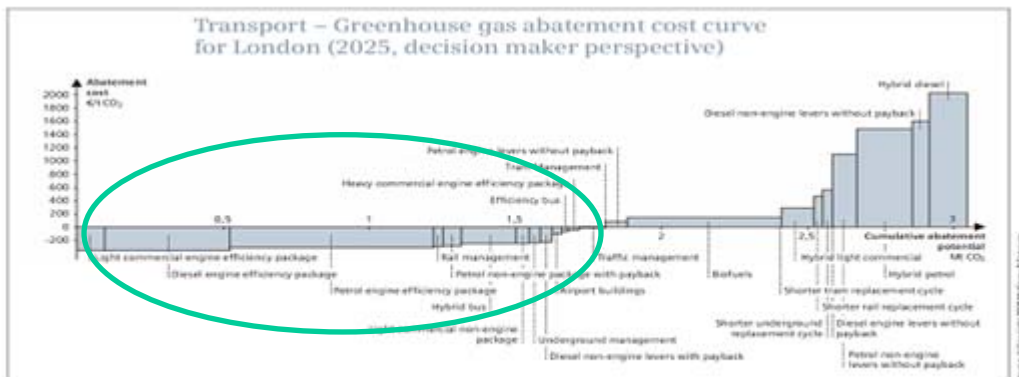
◆ Three main areas for incremental improvements and abatements:

- Buildings
- Transport
- Local power and heat

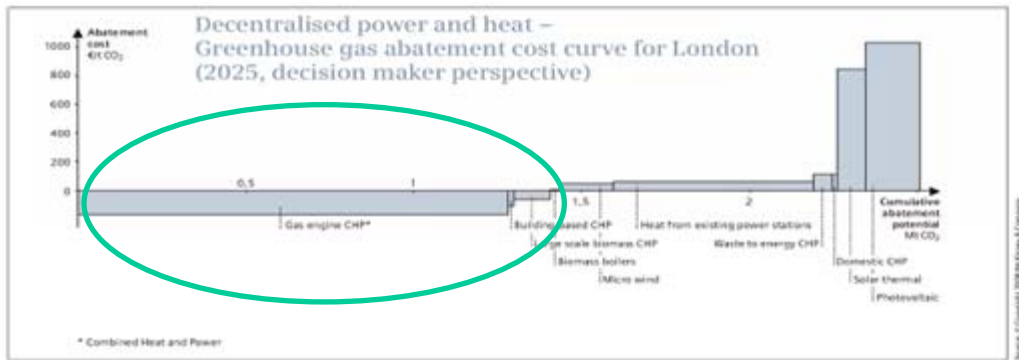
◆ Negative costs: aren't they a good measure of actual transaction costs ?



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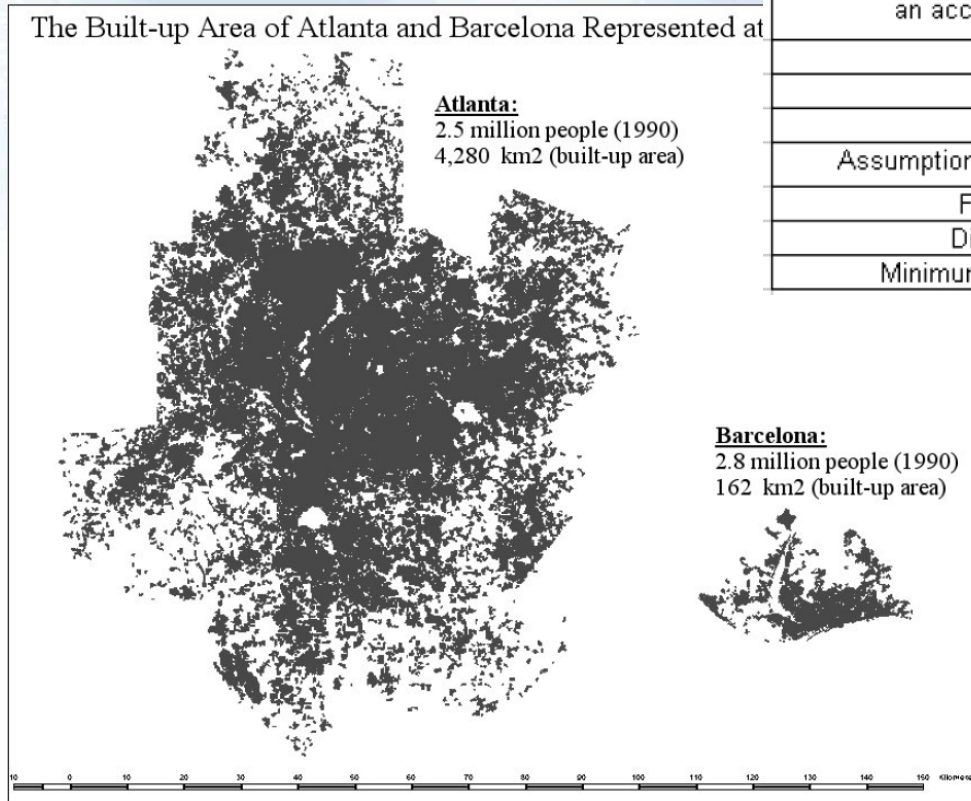


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# The spatial dimension as a key variable for buildings and transport energy needs



		Atlanta	Barcelona	
area:	km <sup>2</sup>	4280	162	
population (1990)	million people	2.5	2.8	
Approximate length of bus lines required to provide an accessibility of 800 m to every bus stop	km	4,280	162	
	people per km of bus line	584	17,284	
	density	p/ha	5.84	172.84
Assumption on average speed during rush hour	km/h	18	18	
Frequency of buses during rush hour	minutes	5	5	
Distance between buses at rush hour	km	1.5	1.5	
Minimum number of buses during rush hour		<b>2,853</b>	<b>108</b>	

Source : A. Bertaud, 2002

# Sustainable energy systems for dense cities ?

- ◆ Density is not by itself a guarantee of a sustainable energy system  
(a view of Shanghai)



# Sustainable solutions for sprawled cities

- ◆ V2B + V2G  
Vehicle to Building  
and Smartgrid  
solutions may be  
one route for the  
deep greening of  
energy systems

## Plug-in Vehicles and Renewable Energy

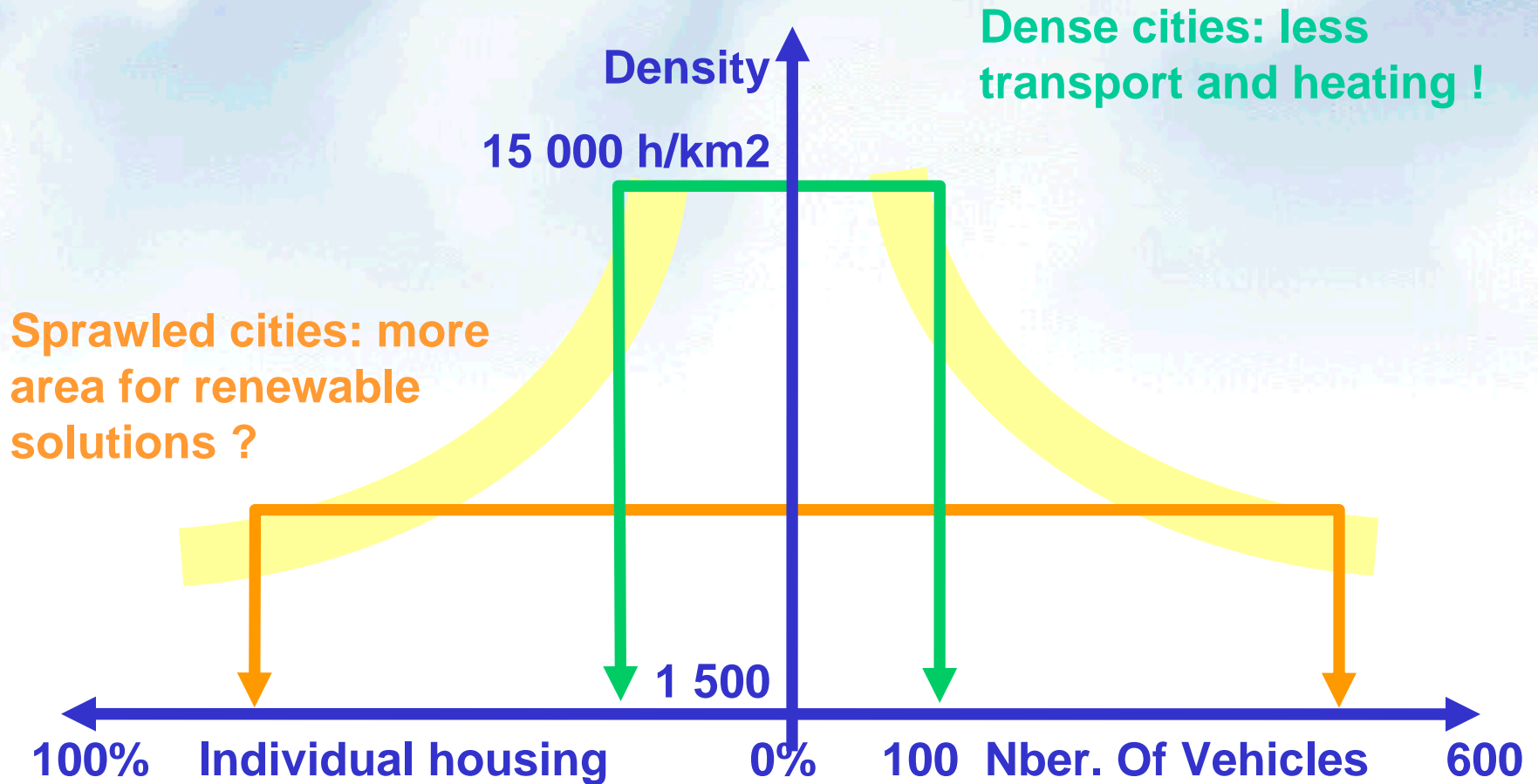


- Plug-in Vehicles are the only practical vehicles that can be charged from renewable energy produced at home

- A 2 kW rooftop solar array provides all the electricity for typical 12,000 mi/yr
  - \$12 - 15,000 upfront cost
  - 180 - 260 square feet
  - 6 - 8 year payback
  - >30-year life



# Exploring models of sustainable urban development



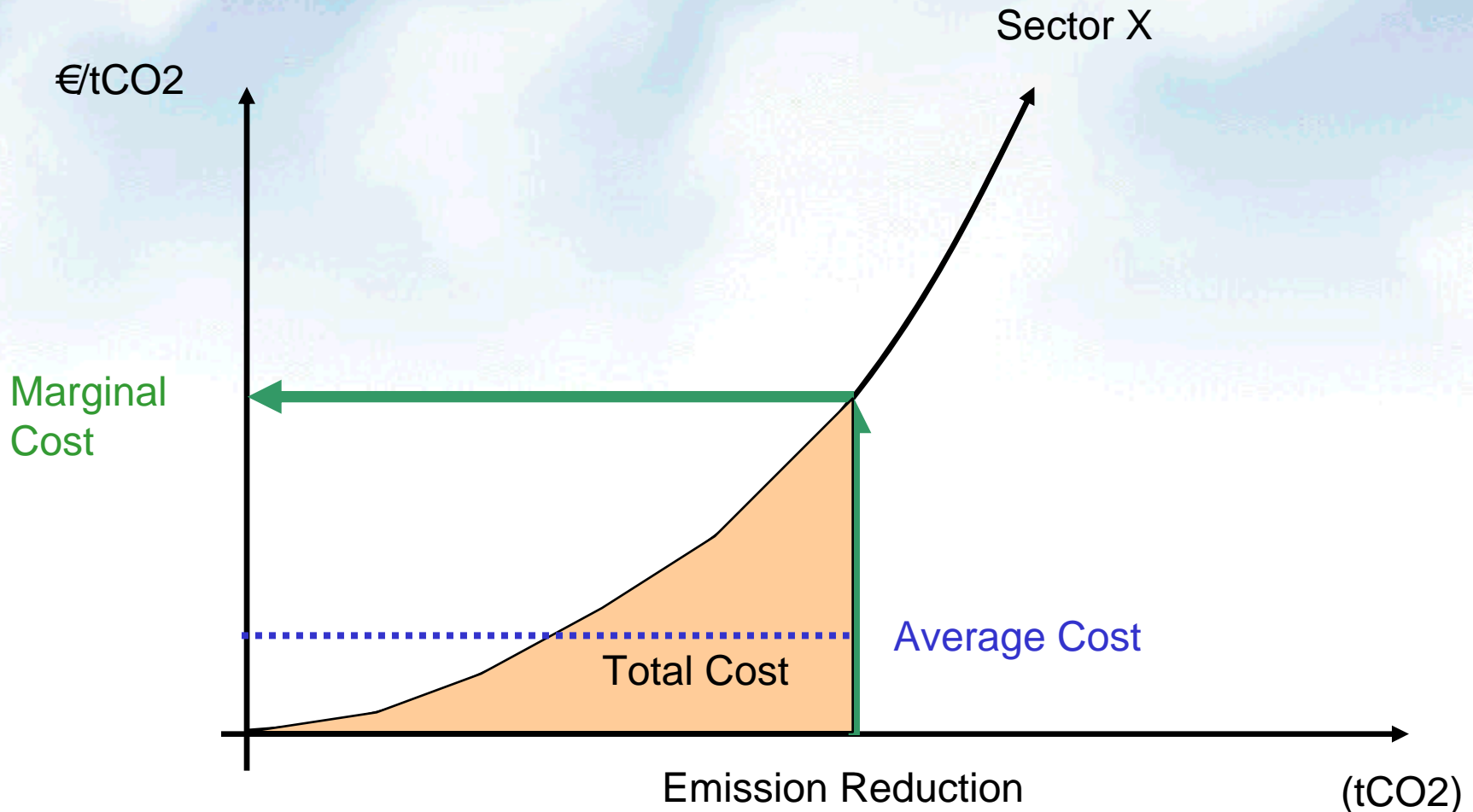
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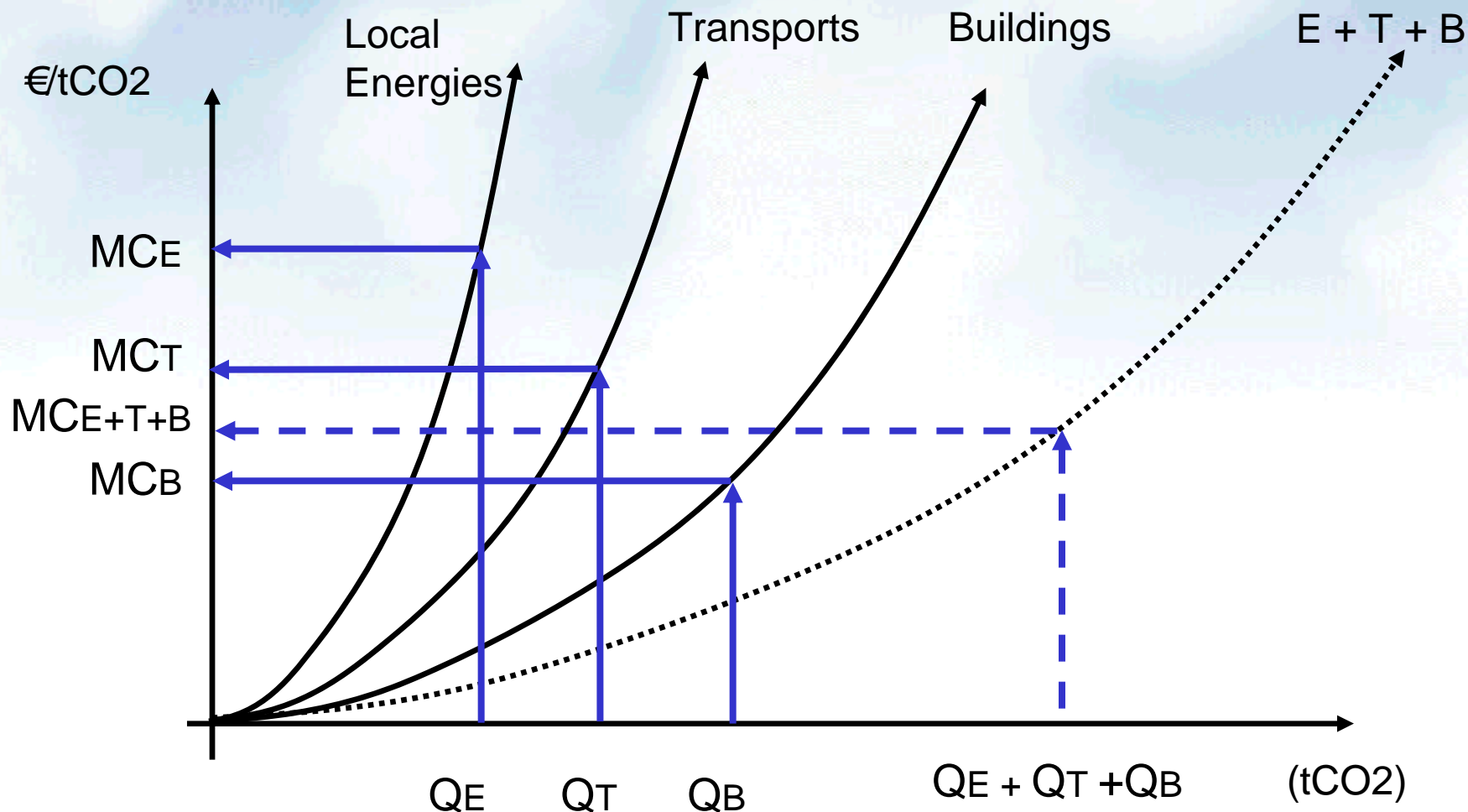
# Introducing cost-effectiveness

- ◆ Few LCPs today consider the economic dimension of the problem
- ◆ ...while the requirement for cost-effectiveness should probably be proportional to the environmental ambition
- ◆ The challenge for the design of cost-effective LCPs is probably to develop the capability of combining the system and the incremental approaches
- ◆ As for the analysis of international negotiations, the development of MAC curves is one of the simplest and most powerful solution

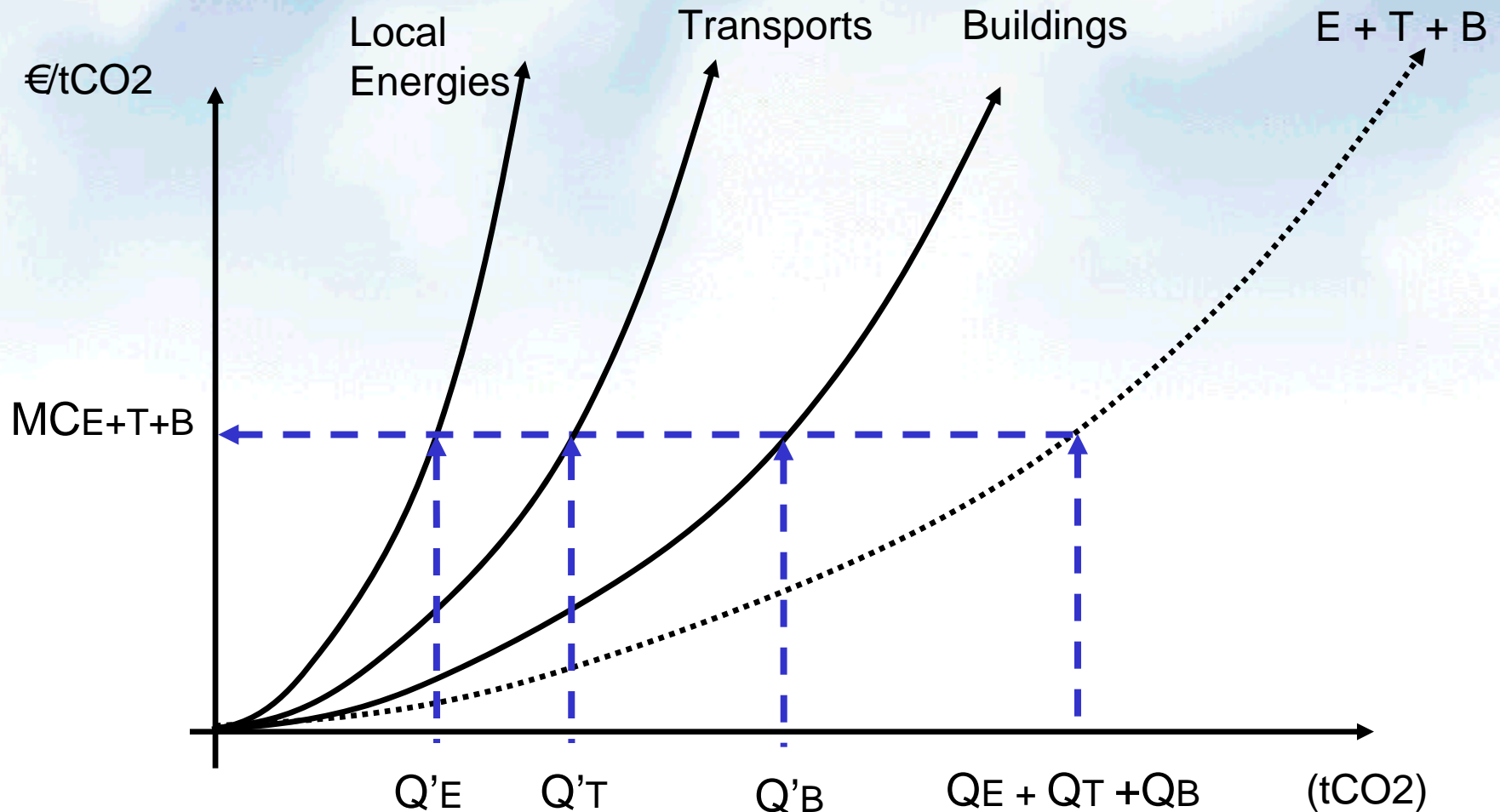
# MAC curves a powerful tool to assess the costs of climate policies



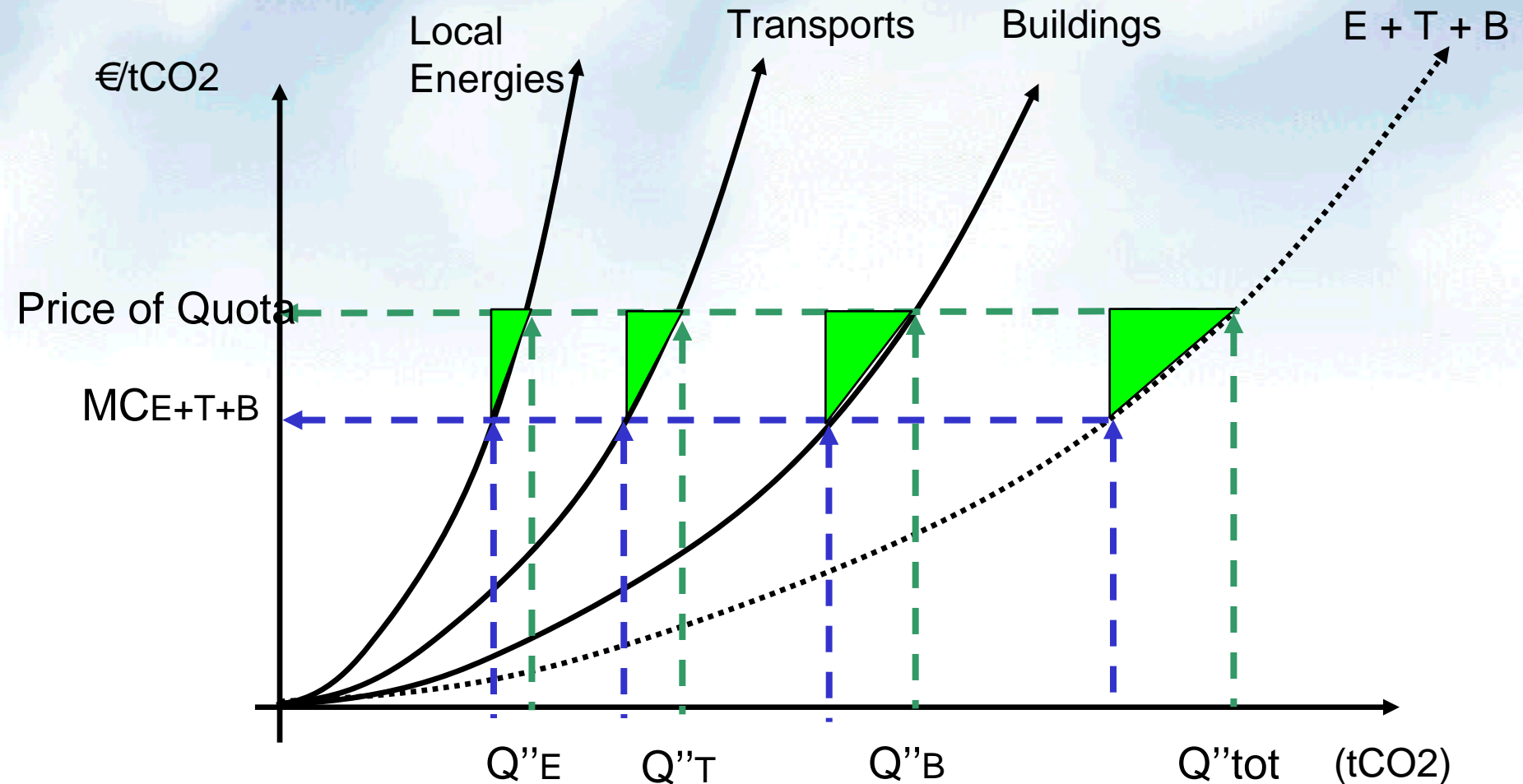
# MACCs: 1/ connect reductions and costs



## 2/define cost-effective abatement programs



# 3/ identify opportunities for entering an ETS



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# Strategic issues

1. Build an open and flexible framework for the definition of the emission perimeter:
  - Limiting it to the authority's own direct GHGs is not a solution
  - Including total indirect (grey) emissions of a territory neither
  - Deciding on the inclusion of industries should probably be a choice (social dimension)
2. Develop commonly agreed and robust *measurement* methodologies. This is a must for MRV: solutions wanted !

# Strategic issues (continued)

3. Include a monitoring of abatement costs in the Observatories
4. Develop the capabilities for a foresight system of cities emission and abatement options:
  - The ideal solution would be a full model of cities energy system (comparable to national energy systems model)
  - But a short term realistic option is to combine the systemic approach for transport and land use
  - Qualitative foresight is also important (OST's Intelligent Infrastructure Study)

# Strategic issues (end ?)

5. Develop a research program on LCP and the finance of cities and territories
6. Examine the conditions for the use of ETS as a way to take advantage of the « low hanging fruits » in order to climb higher in the MAC curves
7. ...