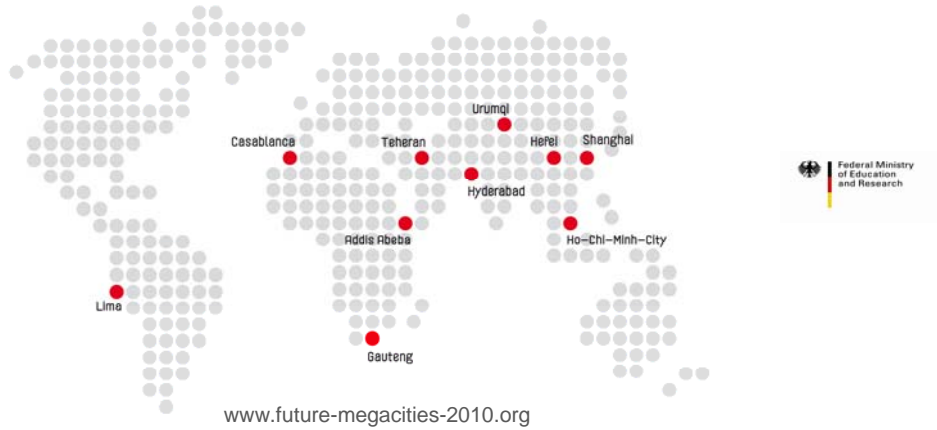


Aggregated Mitigation and Adaptation Potentials of Future Megacities – an Overview on Intermediate Project Results

MEGACITIES INDICATORS

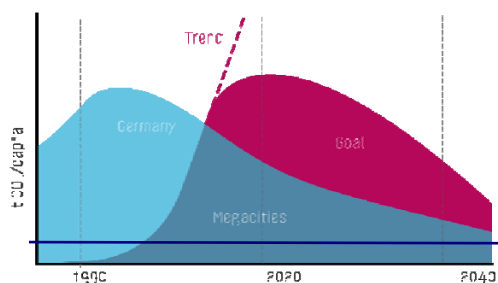


**Energy and climate efficient structures in the megacity projects
- content and structure -**

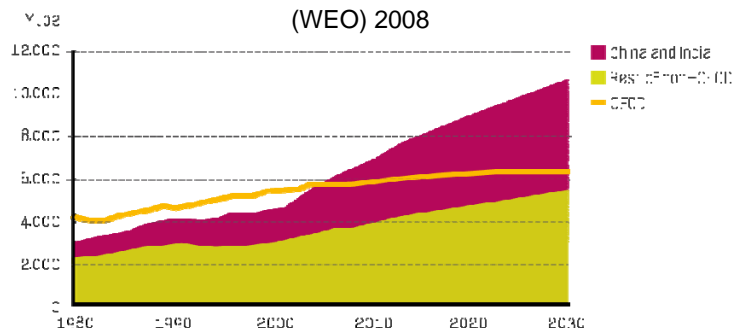
1. A holistic view on the megacity projects – opportunities and limits
2. Energy use and GHG emissions - indicators and observations
3. Adaptation and mitigation measures - case studies, examples and products
4. Conclusions and outlook

Developed and developing/transition countries – two worlds ! ?

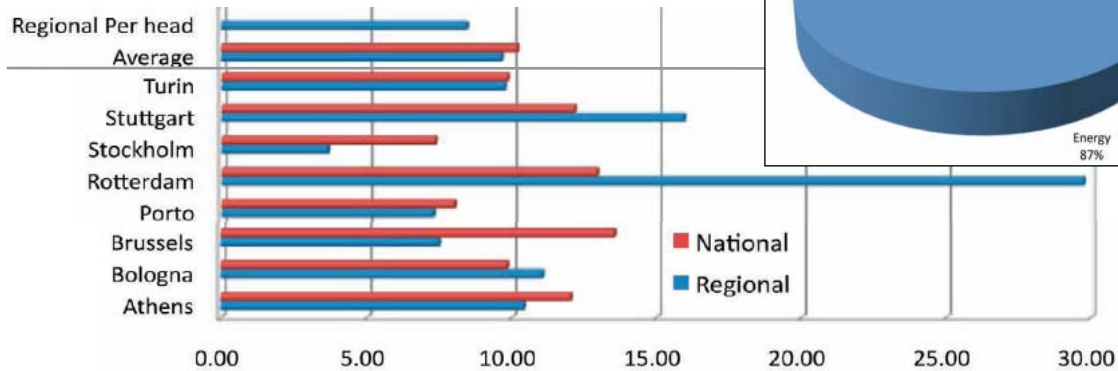
CO₂ Trends and Goals



World Energy Demand by Region until 2030 (WEO) 2008



**CO_{2eq} Emissions per Capita in
European Metropolitan Regions**
(source: EUCO2°80/50)



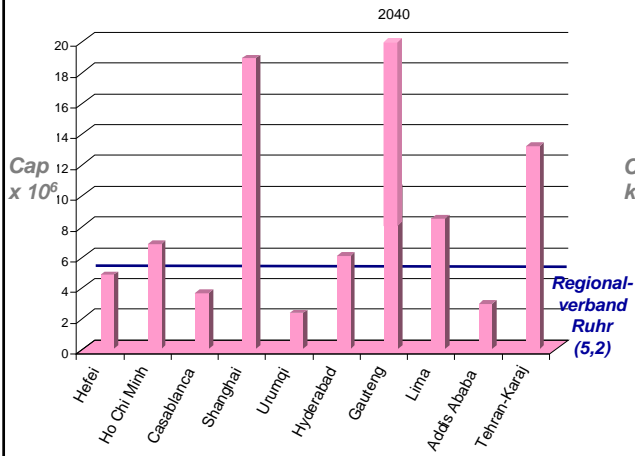
Cities and Future Megacities:

- are situated in very different environments and frame conditions
- fulfill very different purposes (residential, administration, industry, logistics, etc.)
- have to be enabled to fulfill a role within the society

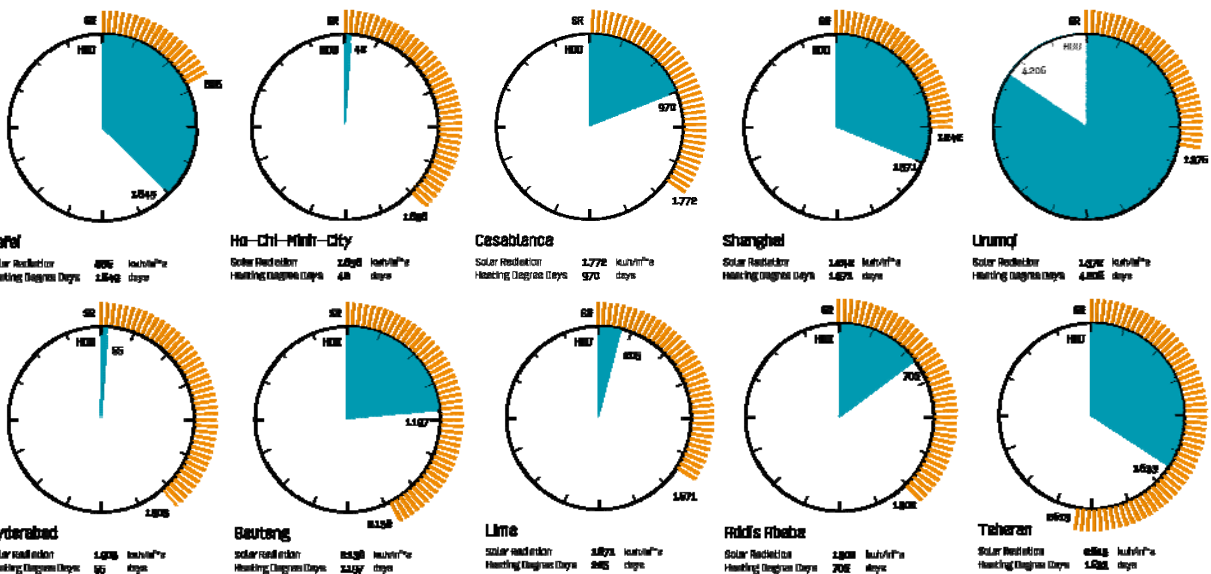
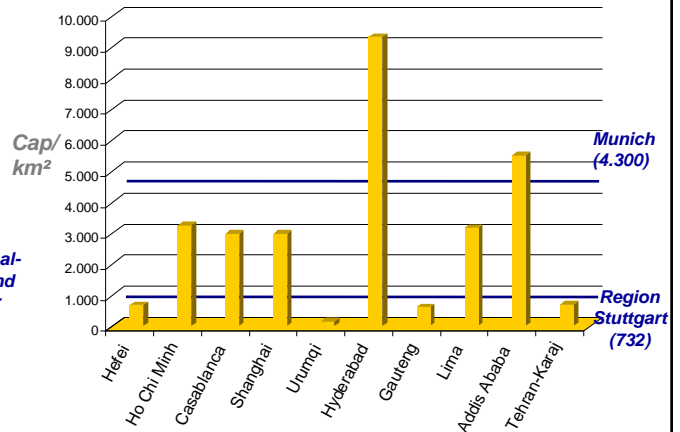
Future Megacities in the Developing World:

- have the need and right (!) for economic growth
- need to fulfill the hunger for energy and allow increasing emissions
- Need to decide despite a lack and inconsistency of data

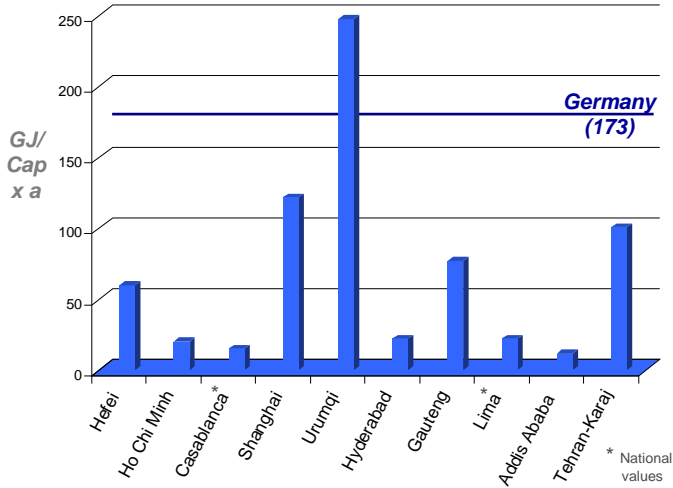
Population



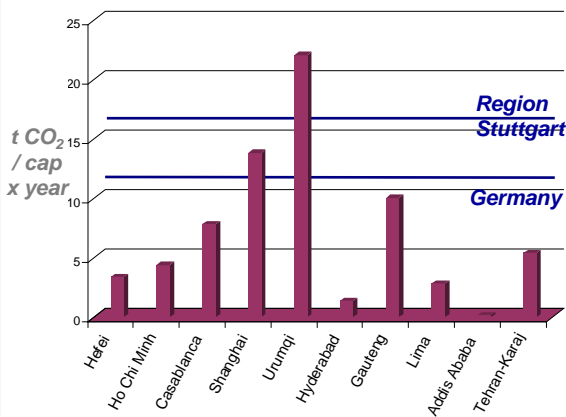
Population density



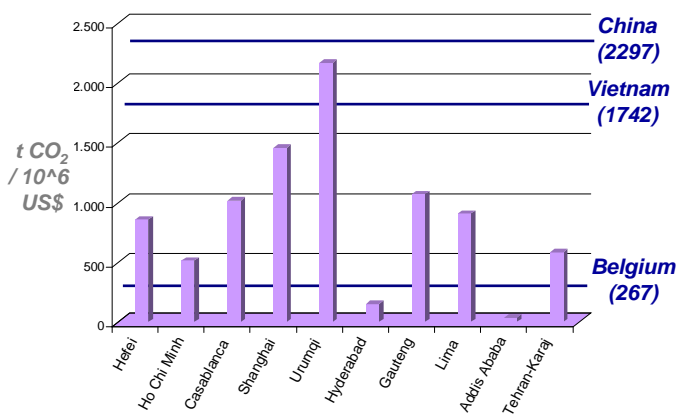
Primary Energy Demand



CO₂eq-Emissions per Capita



CO₂eq-emissions per unit GDP

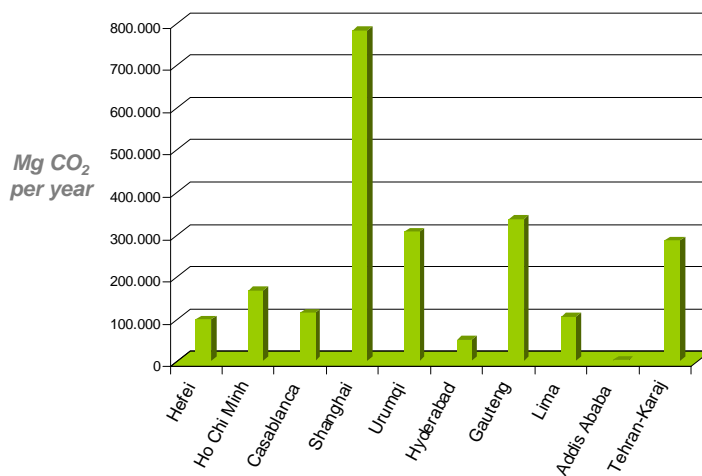


Potential for CO₂-Reduction by the Projects

mitigate the increase of energy use and CO₂ emissions

1. Increase the CO₂ efficiency (emission intensity per unit GDP) of the megacities economy **by 2% per year**
2. Reduce the higher CO₂ emissions **by 1% per year**

CO₂-Reduction Potential by the Projects



Total reduction potential:
 2,24 Mio. t CO₂ per year

Cost of CER:
 15 EUR / t CO₂

Total cost savings:
 33,6 Mio. EUR per year



	Lima	Casablanca	Batavia	Abidjan	Tehran	Hyderabad	Urumqi	Hanoi	Ho-Chi-Minh-City	Shanghai
MITIGATION	Buildings	●	●		●		●		●	●
	Transport + Mobility		●		●			●		●
	Urban Development	●	●	●	●	●			●	●
ADAPTATION	●	●		●		●	●		●	



Mitigation in the building sector

Ho-Chi-Minh-City

Fields of action: energy-efficient housing
CO₂ saving potentials **minus 10%** (CO₂ t/cap/a)

Shanghai

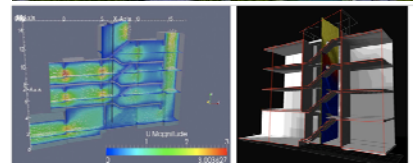
Fields of action: energy-efficient housing and office buildings, energy education (participation)
CO₂ saving potentials
Office buildings **minus 1,72 CO₂ t/cap/a : 59 %**
Residential buildings **minus 0,3 CO₂ t/cap/a : 23,5 %**

Urumqi

Fields of action: existing buildings and new buildings
CO₂ saving potential **minus 1 CO₂ t/cap/a**

Teheran Karaj

Fields of action: energy-efficient housing
CO₂ saving potentials **minus 10%** (t CO₂/cap/a)





Mitigation in the transport/mobility sector

_Gauteng

Field of action: BRT; modal shift
CO₂ saving potentials **minus 6** Mio t CO₂

_Tehran-Karaj

Field of action: traffic optimized land-use planning
CO₂ saving potentials **minus 3% - 7%** (t CO₂/cap)

_Hefei

Field of action: traffic management system, modeling CO₂ emissions

_Shanghai

Field of action: tools for planning and monitoring energy efficient mobility
E-mobility, traffic management for parking, TOD, high quality PT, logistics



Mitigation in urban development

_Urumqi

Field of action: Sustainability and energy-efficiency in the industrial sector:
Energy and mass flow analysis for companies and their products, support for CDM, Energy scenario modelling, energy education
CO₂ saving potentials **minus 5** Mt CO₂/a

_Shanghai

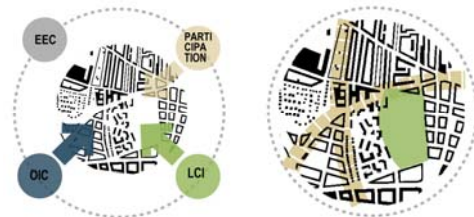
Field of action (integrated): Energy relevant aspects of urban form, mobility, building quality and renewable energies
Energy education (participation)
CO₂ saving potentials **minus 3,5** t CO₂/cap/a

_Gauteng

Field of action: integrated approach

_Tehran-Karaj

Field of action: integrated approach





Adaptation/Mitigation in Urban Development

_Lima

Water

Field of action: Water supply and waste water management (reuse, treatment, disposal), interaction with energy systems, Infrastructural measures, operational measures (top-down) and awareness rising campaigns, education, metering, etc (bottom-up)

_Casablanca

Urban Agriculture

Field of action: Resource-efficient urban agriculture, reduction of heat stress and flooding risks in settlements
Dry land farming to irrigation farming, water re-use in agriculture, etc.

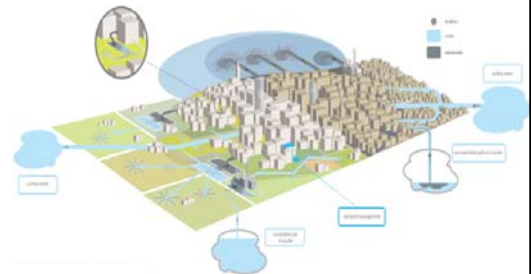
_Addis Abeba

Integrated Approach

Field of action: Integrated approach sustainable waste recycling, erosion protection

Adopted technologies, top down (modelling and simulation) and bottom up (analysis, implementation, training and and competence center), etc.

CO₂ saving potentials **minus 0,5 t CO₂/cap/a**



Adaptation/Mitigation in Urban Development

_Ho Chi Minh City

Sealevel rise

Field of action: Guidelines implementation (top-down/urban level), community participation (bottom-up/household level); controll population and urbanization, re-planning, upgrade infrastructure

_Hyderabad

Integrated approach

Field of action: Integrated approach (building, mobility, renewable energy and change of urban structures)

Small projects for urban heat stress reduction, rain water harvesting, CO₂ saving potentials **minus 0,5 t CO₂/cap/a**



Conclusion and outlook

- 1 The projects show substantial potentials of increasing the energy-efficiency and reducing CO₂ emissions. This can result in cost saving in the order of magnitude of 33.6 Mio EUR/a.
- 2 The fields of action are multifaceted: The different megacities and nations, the different traditions and cultures reveal individual paths towards energy-efficiency and at the same time a growing quality of life.
- 3 The projects reveal the scale and the dimension of the potentials: The maximum in one megacity is not enough in the other.
- 4 The project's results have been translated into local and national policies, guidelines, standards. The projects also show integrated approaches with promising technical, economic, and social impact.
- 5 A multitude of tools has been developed to plan, monitor and recommend case studies and projects

Keep on going!

Thank you for your attention

More information

www.future-megacities.org



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