Cities and Green Buildings

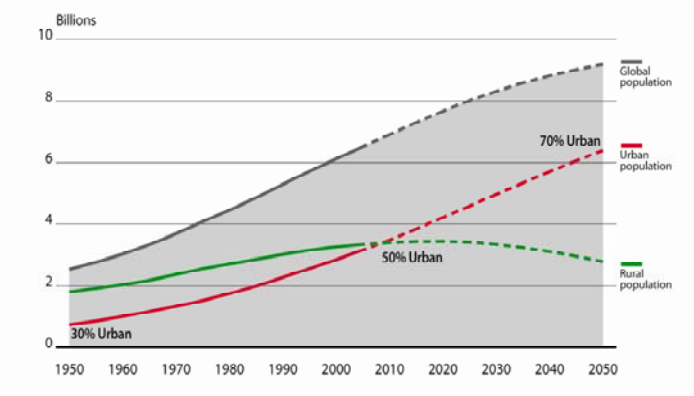
In the Transition to a Green Economy

A UNEP Brief

Context

2008 was a turning point in history – for the very first time the number of urban dwellers surpassed the number of people living in rural area[1]. The number of cities with over a million went from 11 cities in 1900 to 378 in 2000 and it is estimated that this number will increase to 599 by 2025[2].

Close to 80 per cent of these (479 cities) will be in developing countries. According to the World Urbanisation Prospects (2007), all of the population growth in the next four decades will be absorbed by urban areas; even more significantly, most of this growth is expected to occur in the cities and towns of the developing world.

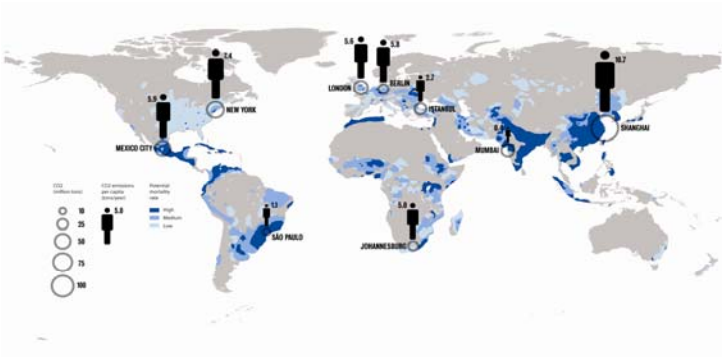


Source: Urban Age Programme based on UN World Urbanisation Prospects, the 2007 Revision.

Challenges

- Cities occupy just 2 per cent of the world's terrestrial surface, and now contain 50 per cent of its population and consume over 75 per cent of its natural resources.
- Urban based economic activities account for 55 per cent of GNP in LDCs, 73 per cent in middle income countries, and 85 per cent in the most developed countries[3].
- Failing to achieve sustainability in urban areas will undermine overall efforts to sustain natural capital and livelihoods that depend on it not only in the cities, but also in poor rural areas.

Flood risks and CO2 emissions for a selection of cities



Source: Urban Age Programme based on UN World Urbanisation Prospects, the 2007 Revision.

- Projections up to 2025 indicate that strong urban growth will occur in South Asia and Sub-Saharan Africa, regions where infrastructure and social development is seriously lacking.
- A 60 per cent increase in urbanisation by 2030 will drive an increase in city energy use to 73 per cent of the world's energy use[4]. Related CO2 emissions in cities will reach 79 per cent of the world total.
- Worldwide 23 per cent of the energy consumed occurs in the residential and commercial sector: 19 per cent in OECD countries; 34 per cent in non-OECD countries.
- Urban areas account for about 75 per cent of all energy use and GHG emissions in the world. Between 1970 and 1990 total direct and indirect emissions from the building sector grew by 75 per cent[5].
- No less than 400 million urban dwellers are exposed to risks associated with sea-level rise. These risks are most pronounced in the least developed regions of the world[6].

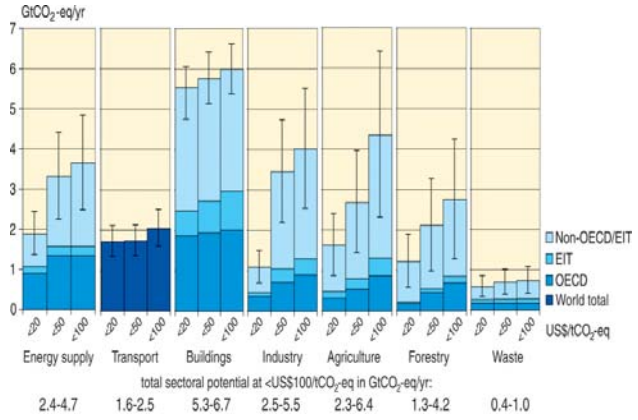
Facing this myriad of challenges requires new approaches to the critical links that spatial design has with distance, time and ultimately productivity; that ecological infrastructure has with access to basic needs such as water, clean air and ultimately poverty and human wellbeing.

Green economy oportunities

Cities are critical geographical units in the formulation and implementation of policies that will shape our future across sectors, such as water, transport, energy, waste management, construction or communication. To be able to use cities as transformative tools for greening the economy and using the scale economies that they offer, it is crucial to integrate their spatial design with that of buildings and transport systems.

- There is a global potential to reduce approximately 29 per cent of the projected baseline emissions by 2020 cost-effectively in the residential and commercial sectors, the highest among all sectors studied in the IPCC Fourth Assessment Report.
- A transition to energy-efficient buildings would create millions of jobs, as well as "greening" existing employment for many of the estimated 111 million people working in the construction sector.
- Investments in energy-efficient buildings could generate an additional 2 to 3.5 million jobs in Europe and the US alone.
- The potential is much higher in developing countries and in countries in transition which often have large stocks of inefficient buildings[7].
- In Mexico City Bus Rapid Transport schemes BRT schemes alongside cycle-ways and new traffic measures, envisage a 10 per cent cut in transport-related smog and fine air particles and average annual benefits of over US$750 million.
- For a US$ 2 million Marikina bikeway project in Manila, it is estimated that for every dollar there will be a two dollar return in health and wider environmental benefits.
- In Rio de Janeiro, improved operation of diesel buses lead to annual savings of 40 million liters of fuel - a 12.5 per cent reduction.
- A widespread adoption of the efficiency standards of light-duty vehicles in OECD countries in non-OECD countries and greater hybridisation and electrification of fleets could deliver a 50 per cent improvement in vehicle efficiency[8].
- The Eastgate building in Zimbabwe uses less than 10 per cent of the energy of a conventional building. Using building design that mimics cooling mounds of termites, Eastgate's owners saved $3.5 million on a $36 million building. Rents are 20 per cent lower than in other buildings.

Climate change: Estimated economic mitigation potential by sector and region using technologies and practices expected to be available in 2030.



Source: IPCC, Fourth Assessment Report.
Note: Potentials not including non-technical options such as lifestyle changes.

- The Green Economy will thus throw up a mix of challenges and opportunities with regards to the role of cities in ensuring sustainability in the future. The emphasis will be on the need for integrated policy approaches to governance, planning, finance and broader developmental and poverty dimensions which all are critical elements for cities to serve as a powerful geographical unit in the emergence of a green economy.
- In the long-run, if a city can prioritise the sharing of resources, widespread use of public amenities and ultimately an energy-efficiency combined with social opportunity, city making will help provide solutions to the global environmental crisis.

Investing in sustainable cities and green construction

Evidence and analysis suggest that investments in sustainable multifunctional cities and greening of the building and construction sector offer high returns as well as multiple economic, social, and environmental benefits, for governments, businesses and society at large.

Several investment opportunities exist, including in the following areas:

- Retrofitting of existing building stock.
- Energy efficiency and use of renewable energies in buildings.
- Energy efficient lighting offers a huge energy saving potential.
- Investment in passive and low energy strategies, such as: daytime ventilation, shading for solar control, thermal mass for cooling and heating, etc.
- Investment in alternative and green building materials and construction technologies.
- City Bus Rapid Transport schemes and other mass transit systems.

Cities will be central in bringing about tomorrow's economic benefits and welfare, the provision of decent jobs and human well-being within an environment liberated from the risks and threats of climate change, pollution, resource depletion and ecosystem degradation.

Achieving the transformative change in cities requires that we urgently integrate urban design in our planning policies, co-integrate nature and human economic development harmoniously, building and designing with nature.

Enabling Conditions

- Recognition of the complexity of the inter-relationships within the unit of the city: multiple systems, causalities and effects.
- Emphasis on the need for integrated policy approaches and the identification of the key actions that will be required over the next few decades.
- Planning: Guidelines for an integrated approach, long-term and multi-scalar approach to city planning.
- Governance: Decentralisation, transparency and accountability; regulatory reforms including building codes for acquisition, development, design and construction, standards and certificates, energy audits and labelling.
- Finance: Long-term sustainability, public-private partnerships, business-cycle repercussions, incentives for industry and users, including fiscal and financial incentives.

For comments, feedback and more details:

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[1] United Nations World Urbanization Prospects 2007 Revision, New York 2008.

[2] Compiled by Urban Age from various statistical sources.

[3] UN-Habitat, 'State of the World's Cities 2006/2007', Earthscan 2006.

[4] UNEP and UN-Habitat, 'Ecosystems and Biodiversity: The role of Cities' involvement', Nairobi, Kenya 2005.

[5] IPCC. (2007a). Climate Change 2007: Synthesis Report. Summary for Policymakers. Cambridge: Cambridge University Press.

[6] UN-Habitat, 'State of the World's Cities 2008/2009: Harmonious Cities', Earthscan, 2008.

[7] American Council for an Energy Efficient Economy. Reports EO72, EO76 and EO82, 2007.

[8] ibid