

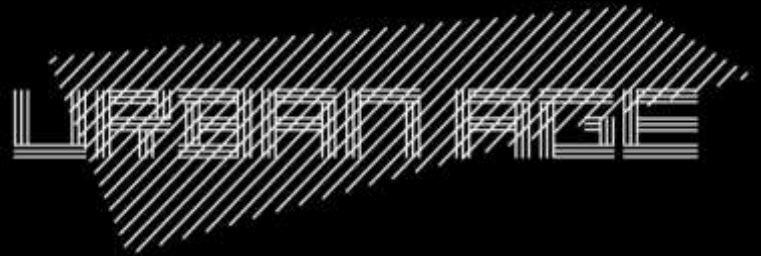
URBAN AGE ELECTRIC CITY CONFERENCE

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The green economy: A global perspective



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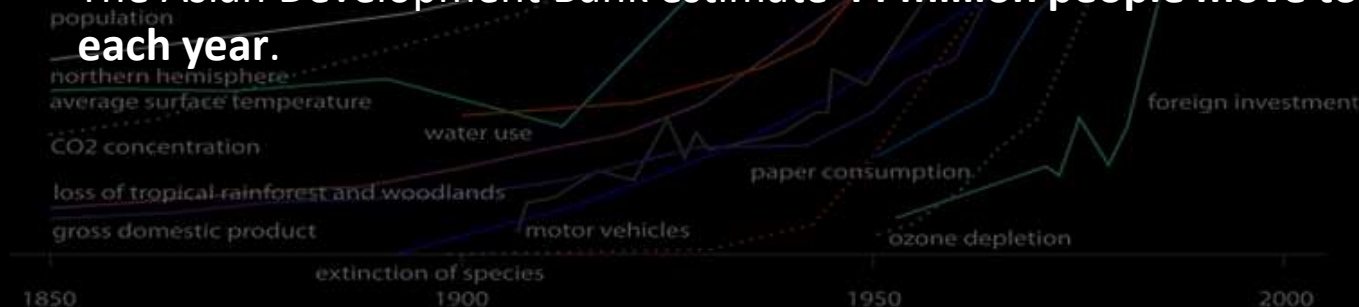
Dimitri Zenghelis

Urban Age Electric City December 6, 2011



Grantham Research Institute on
Climate Change and
the Environment

- Cities will be at the centre of the resource-efficiency story.
- Cities are home to **half the world's 7 billion population**
 - produce ~ **75% of the world's GDP and total GHGs.**
- By 2050, 75% of the world population projected to be living in cities.
 - The Asian Development Bank estimate **44 million people move to cities each year.**





Resource efficient growth

A woman wearing a colorful headwrap and a dark jacket stands behind a large pile of watermelons. She is looking towards the camera. The background is a simple wooden structure, likely a market stall. The lighting is somewhat dim, suggesting an indoor or shaded outdoor setting.

- Cities will be at the centre of the resource-efficiency story.
- Cities are about efficiency. Static and dynamic.
- Urban areas are well placed to lead the resource efficient transition. Cities contain **concentrated mix of specialisation and diversity** and economic activity which generates a **fertile environment for innovation** in ideas, technologies and processes.

A woman wearing a patterned headscarf and a dark jacket is sitting on a large pile of watermelons. She is holding a mobile phone to her ear and appears to be in conversation. The background is a simple, light-colored wall.

Resource efficient growth – urban co-benefits

Cities are well placed to benefit from strong action:

- **innovation**
- **Increased efficiency**
- **reduced noise**
- **reduced congestion**
- **reduced pollution**
- **attractive environment for skilled labour/entrepreneurs/innovative firms, etc.**

Vulnerabilities and risks: **climate impacts**, e.g., heat, water, floods.



Cities, policy and citizens

Cities have **well developed governance mechanisms** and planning systems.

Effecting **policy action** is often easy at the city level where policymakers are closer, physically and culturally, to their citizens than national governments.

Surveys suggest **urban populations place a higher premium on sustainability**; popular and clearly understood mandate.

Can enable the delivery of low-carbon programmes at scale,
e.g., recycling schemes, energy from waste, broadband networks, plug-in car points, integrated public transport systems, smart buildings, smart grids and **congestion pricing**.



An aerial photograph of a city, likely Dubai, showing a dense urban landscape with a prominent skyscraper under construction in the center. The image is dark and serves as a background for the text.

Delay is costly

Delaying or postponing coordinated investment in resource efficiency is dangerous:

- Stock-flow of greenhouse gases, irreversible depletion of resources.
- Cities lock-in, infrastructure, technologies, mindsets.
- Especially emerging economy cities building the bulk of their infrastructures in the next two or three decades.

Choice: **high- or low- resource-intensive development paths?** Former cheaper in the short run, require less careful planning; extremely costly over medium term/difficult to reverse.



Cities and the macroeconomy

Urban planning and the recent **financial market crash**:

- **Sprawling suburbs** such as Victorville, 100 miles northeast of downtown Los Angeles* entirely dependent on private cars to connect homes to work and services.
- Such neighbourhoods **unviable** when fuel prices rose from \$2 early in the decade to \$4 in 2008.
- The unsustainable nature of resource-intensive planning manifests itself in the short- as well as the long-term.

*See Karlenzig (2011) 'The Death of Sprawl'

Global emissions: urban density

- **Denser cities are more resource-efficient** and generate significant savings in operating costs. But people like suburbs too, especially in weak cities.
- **Policy must be integrated and coherent.** This means policies must be coherently planned, for example, efficiently reducing congestion and emissions requires complementary measures on public transport, cycling, electric and shared vehicle infrastructure, urban planning, zoning and carbon pricing.
 - It is estimated that people in **Portland, Oregon**, save US\$2 billion annually through three decades of coordinated policies to change land use and transport systems. Measures include modest increases in **building density**, light rail transit schemes and policies to encourage **walking and cycling**.
 - In many European cities, recycling levels are in the region of 50% of domestic waste, with Copenhagen sending a mere 3% of its waste to landfills.



Urban Leaders

Major world cities are increasingly taking the lead setting strong targets, e.g.:

- **New York** (30% cuts in GHGs 2007-2030),
- **LA** (35% cuts 1990-2030),
- **Seoul** (40% cuts 1990-2030),
- **Hong Kong** (50-60% cuts 2005-2020);
- In China, The "Sino-Singapore **Tianjin** Eco-city' in the Coastal New District of Tianjin City in northern China.
- NDRC low-carbon city project (part of 'local' 12th 5-year plans) include **Tianjin, Chongqing, Shenzhen, Xiamen, Hangzhou, Nanchang, Guiyang and Baoding.**
- Copenhagen Stockholm, Freiberg, Barcelona

Strong action in cities has the potential to influence the national agenda (see Annex)

Efficient cities are ‘smart’

Integrated technologies will help make dense complex cities work efficiently. Cities are essentially **tightly integrated systems, but with humans!**

- Smart Grid
- Smarter Healthcare
- Smarter Public Safety
- Smarter Buildings – energy Management

Cities that **think, adapt and evolve** will learn to optimize their resources, food, energy, health, communications and climate.

A broadband digital infrastructure can **connect** people to people, people to city systems and city systems to city systems, allowing cities and residents to **respond** to changing circumstances in near real-time.



Policy

- But the need for coordinated policy does not end once the infrastructure for roads, buses railways and smart grids is in place; **policy signals must continue to ensure sustainable behaviour and management.**
- Harness power of markets, **limit transaction costs and distortions.**
- **Address numerous market failures without introducing policy failures.**
 - **Pricing the externality-** carbon pricing via tax or trading, or implicitly through regulation: broadly uniform, credible, long term, global price;
 - Bringing forward lower carbon **technology-** research, development & deployment;
 - Overcoming **information** barriers and transaction costs– regulation, standards;
 - Promoting a shared **understanding** of responsible behaviour across all societies – beyond sticks and carrots.



Conclusion

We are at a crossroads: **inaction will reduce citizen welfare, increase costs and insecurity and eventually risk urban catastrophe.**

- **Resource-efficient growth is the only sustainable long-term option.**
- A strong move now to low-carbon cities can bring a **new era of progress, induced innovation and prosperity.** Cleaner, quieter, more efficient, energy secure sustainably-planned cities also attractive.
- **Credible long-term policy can reduce uncertainty** in recession and generate profitable new markets, drive private investment/jobs/growth.
- **Long-run coordinated thinking is required.**
- Race in a market to **supply a resource-constrained** world.
- Major world cities are increasingly taking the lead setting strong targets.

The **choices made in cities today** on transport, infrastructure, buildings and industry, as they grow rapidly over the coming decades, **will determine:**

- **the technology, institutions and behaviours they lock-in to**
- whether mankind can both manage climate change and capture the benefits of resource-efficient growth.

Annex – emissions by sector

Global emissions: electricity

The most important is **electricity and heat production**, which contribute 37% of global energy related emissions*.

- In **Freiburg**, Germany PV panels cover 13,000 square meters (139,931 square feet) of the city's building surfaces – including the main railway station.
- **San Francisco** operates the largest city-owned solar power system in the United States. The 'London Array' offshore wind-turbine system is due to produce 1,000 MW, enough to power 750,000 homes.
- **Copenhagen's** district heating system, which captures waste heat from power generation, normally released into the sea as hot water, has helped reduce emissions and take US\$1,907 off household bills per annum.
- **San Francisco** Solar Power system.
- Lake water air conditioning as implemented in **Toronto**.
- **Amsterdam** and seawater heating.

*World Resource Institute (2009). "World Greenhouse Gas Emissions for 2005. Available online at http://pdf.wri.org/world_greenhouse_gas_emissions_2005_chart.pdf

Global emissions: buildings

Buildings contribute 25% of the world's energy related greenhouse gas emissions, and a larger proportion of any city's total*.

- The imposition of tough building standards and mandatory **energy certificates**, as well as the provision of **tax incentives, loans and subsidized feed-in tariffs**, has also had a measurable impact on energy demand in a number of European and American cities.

*C40 Cities Climate Leadership Group. "Best Practices Buildings." <http://www.c40cities.org/bestpractices/buildings/>

Global emissions: transport

Transport contributes around 22% of the world's energy related greenhouse gas emissions.

- **Bogotá's** investment in the TransMilenio bus system reduced congestion and emissions; shortened travel time and lowered congestion at peak times by 40%.
- Health and safety benefits have been estimated to exceed the cost for integrated non-motorized and public transport measures by a factor of 5 to 20 times in cities as diverse as **Bogotá, Morogoro and Delhi** (Dora 2007).
- The costs of congestion in **Buenos Aires** are estimated at 3.4% of local GDP, in Mexico City 2.6% and in Dakar 3.4% (World Bank, 2002).
- **Mexico City and Bogotá** have introduced number plate restrictions with measurable impacts on congestion and air quality (Mahendra, 2008).
- Congestion of roads in the UK causes estimated annual losses of around US\$11 billion to 12.6 billion.
- **London's** congestion charge reduced congestion by ~30% between February 2003 and February 2004, in comparison to the same period in previous years and CO2 emissions from traffic inside the charging zone were cut by 19.5% (TFL, 2004).