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# RAPID URBANIZATION IN THE ASIA-PACIFIC REGION A ROADMAP TO 2015 AND BEYOND

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## ABSTRACT

UNESCO, the UN nodal agency for education, science, culture and architecture, has made sustainability a key topic in its development oriented activities, and has launched a new initiative to address the increasing concern of non-sustainable urbanization which currently occurs in the Asia and Pacific region. It is a region of rapid change, cultural alienation and environmental crisis, with a threatening divide between city and countryside. This paper informs about the interdisciplinary research activities conducted by the newly established UNESCO Chair in Sustainable Urban Development for Asia and the Pacific. The Chair's roadmap for the next ten years to facilitate sustainable urban growth is explored and described in detail.

## KEYWORDS

Asia-Pacific region; sustainable cities; principles of green urbanism; emergent forms of compact communities; international collaboration

*Global warming and urbanization are closely interlinked.  
Rapid urbanization, and its impact on communities and the environment,  
is one of the most pressing of today's issues.*

## INTRODUCTION

Cities in the Asia-Pacific region have currently an urbanization rate of 42 percent and growth rate of 2.5 percent p.a., having to accommodate an additional 1.7 billion people in the next 40 years. This represents a doubling of the current urban population. Just from this background, it is obvious that environmental urban strategies for the Asia-Pacific region are desperately needed.

The interdisciplinary research activities conducted by the recently established UNESCO Chair in Sustainable Urban Development for Asia and the Pacific at the University of Newcastle (Australia) are a way forward, establishing a roadmap for the next ten years to facilitate sustainable urban growth and conduct high-level research and consultation to

cities and governments in the Asia-Pacific region. What are the appropriate urban responses to climate change—responses that are both, technically plausible and socially viable?

## A NEW UNESCO INITIATIVE

The UNESCO Chair in Sustainable Urban Development for Asia and the Pacific Region was established in 2008 and is held by Professor Steffen Lehmann. It is a joint initiative of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and The University of Newcastle. The mission of this Chair is to conduct pragmatic and innovative strategic research, as well as to offer advice and capacity building in order to support sustainable development in the Asia-Pacific Region.

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## THE CHALLENGE: A ROADMAP FOR SOLVING URBAN PROBLEMS

The forecasts of the UN Habitat Forum (2008) indicate that over 90 per cent urban growth over the next 15 years which will occur primarily in developing countries. Asia alone will account for more than half of the world's urban population. Climate change presents the Asia-Pacific region with tremendous challenges, probably more than any other region on the globe. The Asia-Pacific Region is the world's fastest growing region and one of the major sources of greenhouse gases, likely to be severely affected by the impact of global warming on regional economies, environment, society and the lives of ordinary citizens.

This is Asia and Australia's first UNESCO Chair in Sustainable Urban Development. The mission and aims of the new UNESCO Chair in Sustainable Urban Development in Asia and the Pacific Region are to foster international research collaboration and capacity building, with a special focus on cities and issues within the region. While the Asia-Pacific Region is experiencing rapid economic growth and extensive urbanization, coupled with continued population increases, the region still faces the challenging issues of poverty and insufficient sustainable management of its urbanization processes. Many of the current developments negatively impact on natural resources and the environment through poor planning, misinformed urban design, air and water pollution and an increase in waste generation.

*It's not that we cannot afford doing it.  
The truth is that we cannot afford  
not doing it.*

### A NEW URBAN ASIA-PACIFIC?

The currently emerging Asia-Pacific region is transforming itself due to complex conditions of continuous change. In the face of mounting challenges, there is a need to identify effective strategies and propose practical solutions to support sustainable urban development in the Asia-Pacific region, whilst looking ahead to the future. Increasing expectations and forecasts indicate that the Asia-Pacific region will play an important role in international efforts that deal with climate change and other critical environmental issues. It is therefore vital to carry out

**FIGURE 1.** Typical view of the clash of buildings between different scales and periods, in inner-city Shanghai. (Photo: E. Burtynsky)



appropriate urban development proposals based on the conditions specific to each area of the region, characterized by great diversity in terms of economy, politics, culture, climate and the natural environment. It is a region of rapid change, cultural alienation and environmental crisis, with a threatening divide between city and countryside.

To carry out strategic research from an Asia-Pacific perspective, the UNESCO Chair will support managing this rapid urbanization and globalization process and enhance collaboration with a broad range of stakeholders, such as national governments, local and regional authorities, businesses, non-governmental organizations, universities, other experts and citizens. Research results will be disseminated freely around the world, contributing to the transition towards a more sustainable society. Cities (both in developed and developing countries in the Asia-Pacific region) can make a real difference in terms of mitigating their global environmental impacts through:

1. Application of international best practice in urban design and climate-responsive architecture;
2. Innovation and utilization of key technologies, such as renewable energy technologies and various information technologies;
3. Proper incentives and regulations, so that all new cities and buildings can be carbon-neutral;

4. Strong leadership by national, regional and municipal leaders, local community groups and academics;
5. Enhanced knowledge transfer and awareness of all citizens.

Quality urban design should be the first strategy utilized to reduce the need for fossil-fuel energy. It is important to note that many improvements do not require heavy financial investment. In many cases measures that bring global environmental benefits can also bring economic savings to a city and a nation, creating new jobs and a future-proofed economy.

### THE AIMS OF THE UNESCO CHAIR

- **Conducting** scientific research in sustainable urban development in resonance with the local and regional needs of the Asia-Pacific region and in line with the priorities of UNESCO's *Medium Term Strategy* (2008–2013), including a focus on the impact of climate change on migration and urbanization.
- **Contributing** to capacity building and professional training, and acting as a *Think Tank*.
- **Enhancing** international cooperation in higher education and research, attracting post-graduate candidates to conduct research under the UNESCO Chair.
- **Advising** and consulting in the area of sustainable architecture and urban design.
- **Strengthening** inter-university and interdisciplinary cooperation in training, education, publications, conferences, seminars, master classes and curricula development.
- **Exchanging** knowledge of international best practice, establishing knowledge sharing in practical and achievable sustainable urban development, for a new urban society.
- **Disseminating** research based best practice for re-engineering existing cities into sustainable cities, sharing experience and developing an *Action Plan*.
- **Transferring** knowledge to developing countries, offering UNESCO Scholarships and Visiting Fellowships to graduates of Asia-Pacific universities.
- **Inspiring** and supporting people to live in a more environmentally friendly way.

*Most energy is consumed and most waste produced in cities. It is projected that in the next 50 years, two-thirds of humanity will be living in towns and cities.*

### Programs and Partnerships

The UNESCO Chair and the University of Newcastle's *s\_Lab* Space Laboratory for Architectural Research and Design collaborate with an international group of experts, including leading scientists, ecologists, landscape architects, engineers, architects, industrial designers, sociologists, manufacturers of building components and many others. The group consults city governments, local communities and the private sector on issues of sustainable urban development. The key principles of 'Green Urbanism' have been developed and published as a conceptual model and practical decision-making tool to manage urban growth (forthcoming book: 'The Principles of Green Urbanism', Routledge London, 2009).

The group can take advantage of ongoing research in environmental sustainability and innovative synergies between the various already existing research centers, such as the Priority Research Centers for Energy and the Management of Climate Change Impact, and the Tom Farrell Institute for the Environment. Collaborations with universities in China, India, Viet Nam, Malaysia, Singapore, Japan, Indonesia, Fiji, Papua New Guinea, Korea, Sri Lanka, Thailand, The Philippines, Bangladesh, Egypt, United Arab Emirates, and various other Pacific Island nations, have been established.

#### *Transforming Cities:*

*We need innovative planning methodologies for sustainable urban growth. There is an urgent need to build more energy-efficient cities and neighborhoods, based on renewable energy sources.*

### THE MAIN RESEARCH AREAS. BUILDING A COLLABORATIVE RESEARCH PROFILE

There are a variety of research initiatives carried out, developing into an internationally recognized platform of excellence, with increased engagement in strategic and enduring partnerships with government and industry. How should cities and communities grow? Outmoded forms of urban planning can

**DIAGRAM 1.** The Three Pillars of ‘Green Urbanism’ developed by the UNESCO Chair. (Copyright: UNESCO Chair, 2008)



make things worse. It is clear that a paradigm shift is necessary to tackle the enormous global challenges. While extreme urbanization processes in Asia and the Pacific region are redefining our conventional urban design theories, research in the following ten topics has gained significance. The research field that is now regarded as highly relevant includes:

***Urban Design, Sustainable Cities and Mobility Research***

- Urban Metabolism: Design principles for sustainable growth of cities and communities.
- Managing the Urbanization process in China: Integrated design strategies for regional solutions.
- Ecological City Theory: Towards a sustainable society after oil.

- Impacts of Climate Change on Coastal Regions and Small Island States: Mitigation and adaptation.
- Cities Ecological Performance Measurement: New assessment tools.
- Design and planning of ‘Green Campus’ projects for rapidly developing Asia-Pacific universities.
- Mobility and Urban Transport: Integrated transport systems to reduce car dependency.
- Port City: Urban renewal of waterfront cities in the Asia-Pacific.
- Brownfield and Adaptive reuse: The role of heritage in sustainable urban design.
- Practical and cost-effective strategies to reduce CO2 emissions for the existing building stock.

**DIAGRAM 2.** The various priority research areas of the UNESCO Chair.



### **Renewable Energy and Materials Research**

- Urban renewable energy sources and energy efficiency.
- Ecological footprint, embodied energy and material lifecycle.
- Decentralized energy generation of clean energy from renewable sources: Solar, wind, biomass, hydrogen, geothermal energy generated on site.
- Transition from fossil energy to renewable power.
- Recycling and waste management in emerging countries.
- Distributed energy generation and waste management as generator of Ideal City form.
- Material selection based on embodied energy and short supply chains.
- Passive low energy strategies for energy-efficient buildings: Doing more with less.
- Urban development and future-proof energy supply.

- Solar architecture: Rediscovering traditional methods of urban sustainability and material use.

### **Compact Mixed-use Communities: New typologies for densification**

- 'Zero-carbon emission cities': Demonstration projects.
- Compact urban form: Carbon-neutral solar cities for India.
- Development of master plans based on the principles of sustainable subdivisions for urban growth.
- Principles of 'Green Urbanism' and their application: Urban design that integrates existing structures (adaptive reuse) and brown field sites; social approaches to urban revitalization.
- Sustainable housing: The relationship between density and housing typology.

**FIGURE 2.** Daily traffic collapse in New Delhi, India; the traditional role of the Indian streetscape as the ultimate ‘public domain’ has gone lost. Reducing car dependency can be achieved through the concept of the ‘City of Short Distances’ and a strong focus on public transport integration. (Photo: S. Lehmann)



- Assessment tools for sustainable growth: Re-inventing a denser suburbia.
- Compact communities: New quality mass housing typologies, neighborhood models for an aging population.

### **Urban Water Management and Biodiversity Research**

- Urban Water Management: Gray water.
- New paradigms in landscape architecture: Urban greenery, parks and gardens.
- Sustainable Site Development: Understanding topography and site.
- Maximizing Biodiversity and Forest Conservation: Enhancing resilience.
- Counteracting Urban Heart Islands.

### **Building Technology and Construction Systems Research**

- Strategies to maximize natural air-ventilation: new façade technologies.
- Building for the future: Envelopes with integration of technical systems.
- Building strategies: Passive solar, day lighting, natural ventilation.
- Principles of solar cooling and evaporative cooling technology.
- Optimized sun shading technology and architecturally integrated solar panels.
- Prefabricated modular timber construction systems, using timber cut from sustainable harvested wood.
- Multi-storey residential timber construction systems.
- Research in new materials and assembly methods for building components.
- New compact micro homes (‘The Sustainable House’) for densification of suburb and centre: The affordable, prefabricated, modular ‘Eco House’.
- Tall buildings: The sustainable high rise for the tropics.

### **Upgrading the Public Space Network Research**

- City of short distances: Requalification of civic space and pedestrian movement, stopping the obsession with the automobile.
- ‘Network Eco-Cities’: Improved public space networks, effective public transport, good pedestrian space.
- Site-specific urban interventions in the public domain.

### **Social Sustainability and Cultural Identity Research**

- Poverty reduction and alleviation: Prevention of slums and urban slum upgrading.
- Empowerment of indigenous community: Local strategies for social responsibility.
- Local capacity building and educational programmes: ‘Grassroots go global’.
- Healthy workplaces of the future, bringing working and living together.

- Regenerating the post-industrial city: The role of inter-disciplinary collaboration in urban revitalization.
- Urban space governance: Policies, urban management and citizenship.
- Heritage and globalization: Maintaining identity, building on best practice.
- Identity and Regionalism in architecture in times of globalization.
- Evolving a 21st century architectural curriculum in a climate of change.

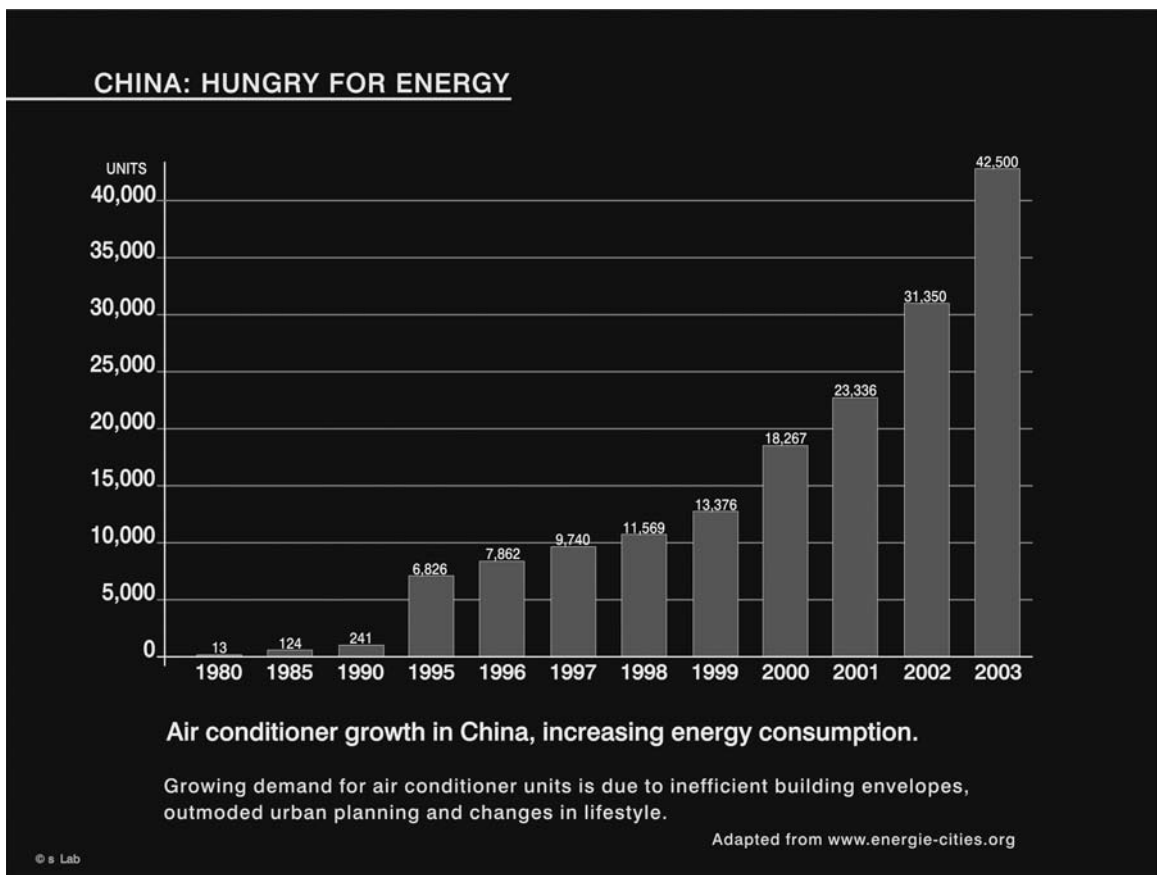
*Cities are the engines of economic growth. As architects and urban designers we are*

*in the business of the future. The task that the people charge us with is to anticipate, to comprehend and to deal with the challenges of future cities. And then, to imagine and identify a vision for their future.*

### A NEW RELATIONSHIP BETWEEN CITY AND COUNTRYSIDE?

With the end of the fossil energy system, a new relationship between city and countryside is emerging, where the city does not exist or grow on the expense of its rural hinterland. Compact communities are stopping urban sprawl, and solar energy allows

**DIAGRAM 3.** The graph illustrates the fast growth of air-condition units in China, and the resulting increase of energy consumption. The growing demand for room air-conditioner units is larger than the number of cars in the same country. It is due to inefficient (not insulated) building envelopes, outmoded urban planning and changes in lifestyle of the Chinese population. (Adapted from: [www.energie-cities.org](http://www.energie-cities.org))



**FIGURE 3.** Two hundred years in twenty: The rapid urbanization of China (and many other countries, such as Vietnam, India, and so on), has swept away more of the past in the last twenty years, than Europe did over a period of two hundred years. The question of social acceptance of such rapid change becomes relevant.

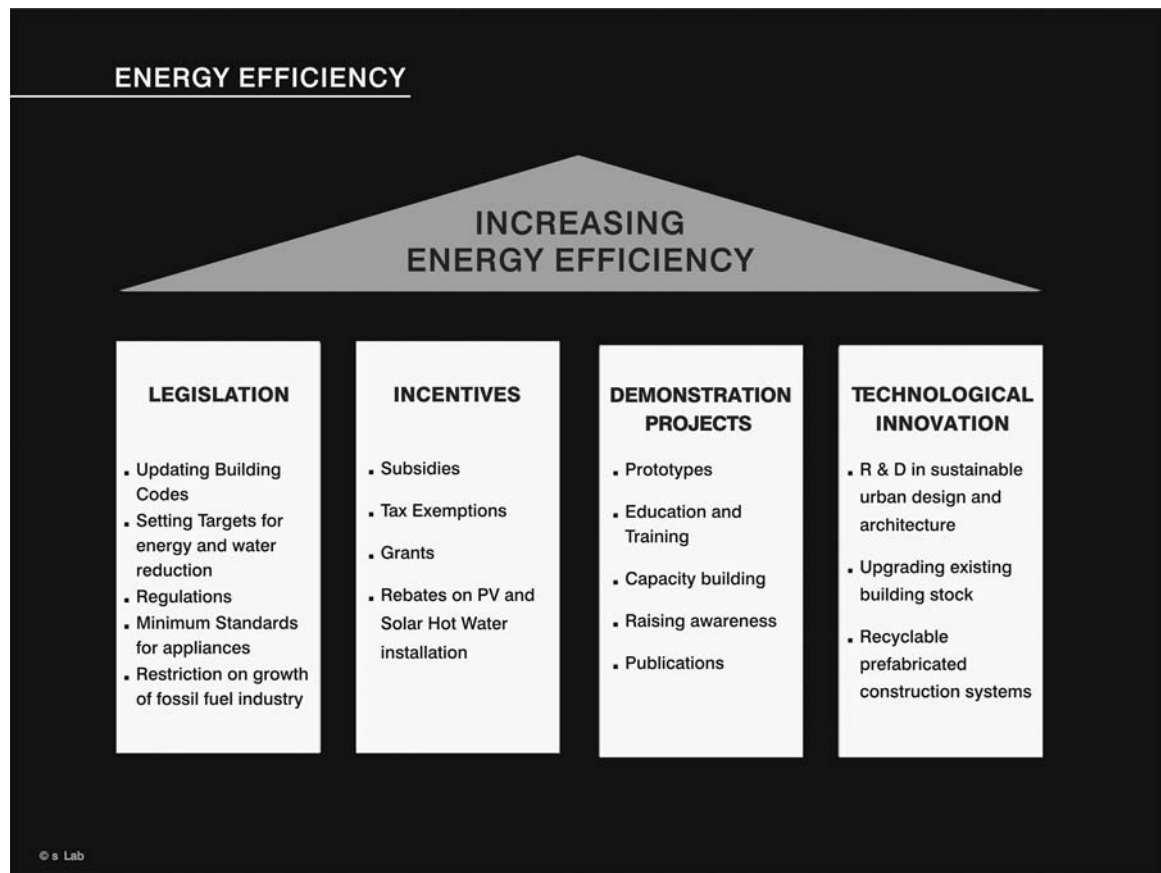


reconnecting the energy production with the place of final energy consumption. With this model, we can achieve energy autonomy and turn the entire city into a *solar power station*. A solar power station where renewable energy sources allow for reconnecting the generation of energy with the place of energy usage. Decentralized, distributed energy generation means that the old infrastructure of the long-distance grid will become obsolete.

### CONCLUSION

Our cities need to change and grow in a more sustainable way. The rapid developing cities in the Asia-Pacific region are hereby of particular concern. Density, climate-responsiveness, public transport

**DIAGRAM 4.** Methods to increase energy-efficiency. (Copyright: UNESCO Chair, 2008)





and renewable energy sources are hereby all key criteria. Installing green systems from the ground-up is easier than retrofitting the existing quarters. If we

have the chance to influence planning of new towns right from the beginning, we have a great chance to get things right.

**DIAGRAM 5.** How we can achieve a better symbiosis between city and countryside. The city could be turned into a power station of decentralized energy generation (at the point of consumption), based on renewable energy sources. (Copyright: UNESCO Chair, 2008)

