East Asia Low Carbon Green Growth Roadmap Forum
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KOICA WORLD'S FRIEND

TRACK 3 PLANNING AND DESIGNING ECO-EFFICIENT INFRASTRUCTURE

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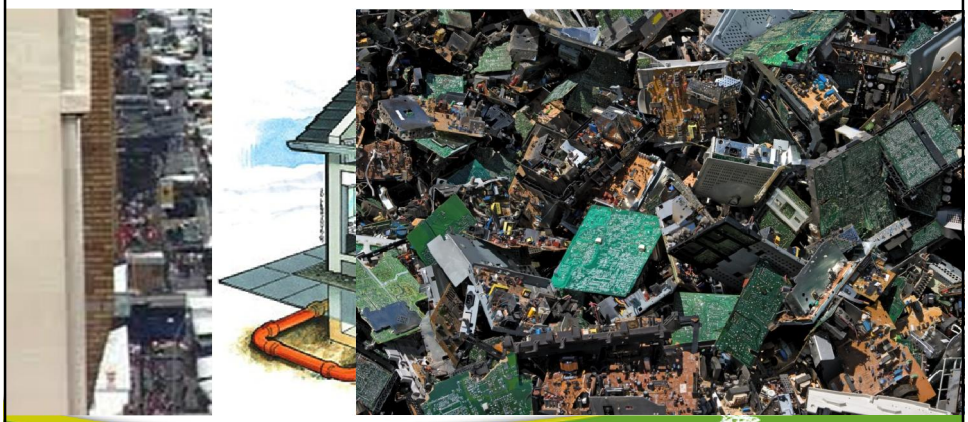
How to avoid being locked in resource intensive infrastructure?



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System change for green growth requires

Shift to eco-city development

From private cars to public transport, from road to rail

From energy wasting to energy saving buildings

Improve the efficiency of energy system and diversify to renewable energy sources

Develop an integrated and decentralized water system

Turn waste from a cost into a resource

Infrastructure determines GHG emission and energy consumption pattern

- Potential in CO2 emission reduction via public transport

Source: UITP, in GIZ, 2010

	% of public transport, walking and cycling	CO2 emissions (kg per capita per year)
Huston	5%	5690 kg
Tokyo	68%	818 kg

- Energy saving potential via urban density

Countries in Asia-Pacific region stand at a crossroads

- Investments in the next five to ten years are critical
- Thinking 30-50 years ahead, designing new infrastructure and retrofitting existing one
- Leapfrogging strategy for countries in the region

Obstacles

- Collective benefits vs. Individual benefits
- Gap between builders and users
- Time and Price Gaps

Urban planning and design: Shift to eco-city development

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From urban sprawl to compact city: Compact & Cellular development

Integrated urban land use and transport planning

Liveability and inclusive development: Promote walkability and car-free development

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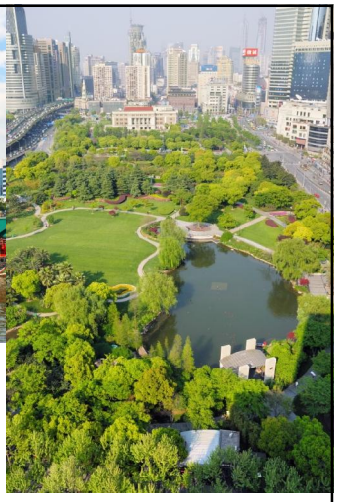
Preserve Open and Green Spaces



Slum upgrading

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Eco-efficient transport system: From private cars to public transport, from road to rail

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From vicious cycle of private cars to virtuous cycle of public transport

- Road is not free: Hidden costs from dependency on private cars
- Rapidly increasing vehicle ownership, decreased modal share in public transport
- Gap between collective benefits and individual preferences

Shift from Road to Rail

- Railways incur higher construction costs compared with roads,
- but carry more passengers, create more jobs and have a smaller carbon footprint per kilometre than roads
- Examples of Japan (e.g. Shinkansen), China, and Republic of Korea

Control private car use

- Remove fuel and car-oriented subsidies, Introduce tax on vehicle purchase and ownership: Double dividend effect
- Implementing congestion charge: London, U.K.
- Restring license plates: Singapore and Beijing, China
- Distance-based insurance scheme: Japan and Republic of Korea

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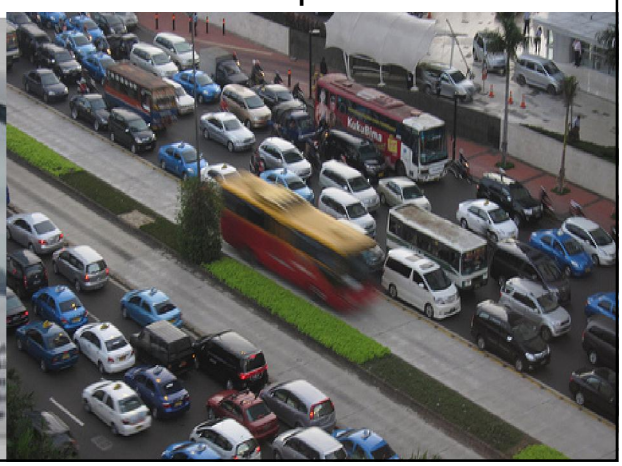
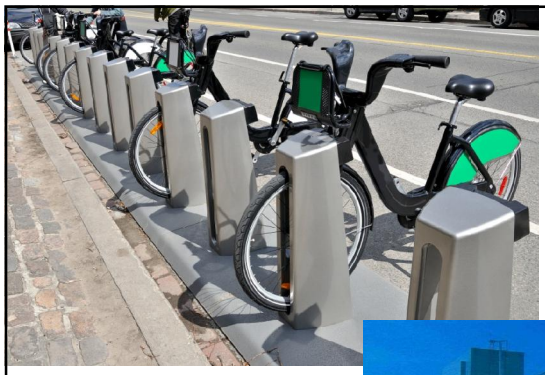
Public transport should be able to compete with private cars

connectivity

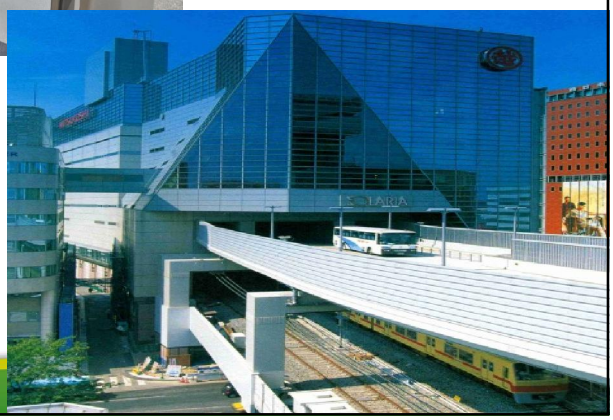
speed





comfort

convenience



Green buildings: from energy wasting to energy saving

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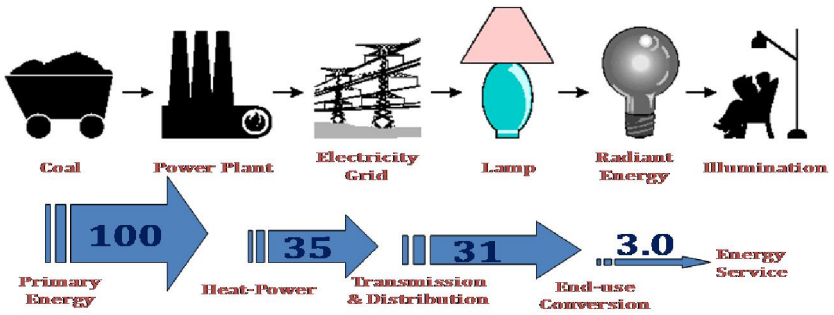
Reducing energy demands in buildings multiplies savings at source



Construction of additional power plants can be avoided

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Green buildings as a win-win opportunity

- Green building costs less throughout it's lifecycle
- Relatively short payback period of additional costs: between 2 and 7 years

Obstacles to green buildings

- Gaps between developers and users/ landlords and tenants
- Hidden costs, risks for retrofitting
- Lack of awareness
- Lack of access to finance

A list of selected policy options

Policy options	Applicability
Certification and labelling	New building, retrofitting (e.g. Green Building Mark in Singapore)
Building energy codes and standards	Mostly for new building (e.g. management of heating and cooling loads in China)
Third-party financing (e.g. energy performance contracting)	Retrofitting
Economic and fiscal measures (e.g. grants, tax breaks, preferential loans, etc)	New building, retrofitting (e.g. Green Deal in U.K., Property Accessed Clean Energy in U.S.A., Eco-point system for housing in Japan)

Eco-efficient energy infrastructure: improve the efficiency of energy system and diversify to renewable energy sources

Triple goals for energy system

- Sustain economic growth and industrialization
- Extend energy access to those without access to modern energy service
- Reduce environmental impacts (e.g. pollution, GHG emissions)

Think 30-50 years ahead!

- Improve the efficiency of energy system
- Shift toward low carbon and cleaner energy system

Policy options for eco-efficient energy system

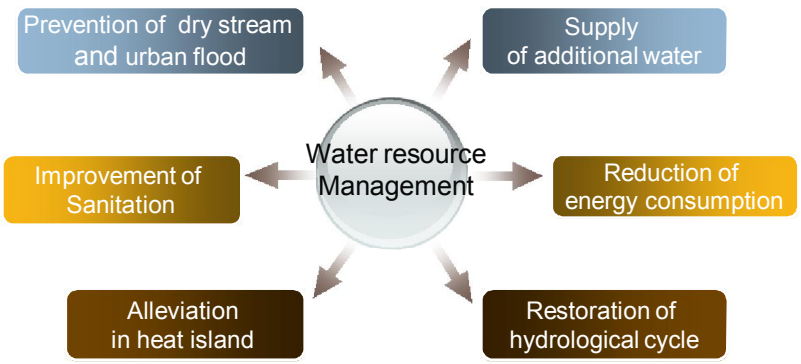
- Improve the efficiency of the current energy system (e.g. combined heat and power) and promote cleaner use of fossil fuel (e.g. gas, clean coal technologies)
- Expand the share of renewable energy
- Invest in next-generation technologies and energy systems (e.g. smart grid, carbon capture and storage)

Core elements for national energy policy frameworks

- Getting the energy price right
- Setting renewable energy target
- Instituting regulatory measures such as feed-in tariffs or renewable energy portfolio standards
- Promoting hybrid and decentralized system based on site-specific examination
- Investing in research, development, demonstration and deployment

Eco-efficient water infrastructure: develop an integrated and decentralized system

Issues on water infrastructure



Policy options for eco-efficient water system

- Promote integrated water resource management
- Promote distributed wastewater management system as a supplementary option to existing centralized system
- Promote a water cycling system through reuse and recycling of water
- Getting the water price right

Integration of eco-efficient water system in urban setting

Eco-efficient solid waste management: turn waste from a cost into a resource

Challenges and Opportunities

- Constraints in land use for dumpsites
- Inefficient use of municipalities' operating budget for waste collection
- Rising prices of raw materials

- Save budget & generate revenue from the resale of waste recovery
- Reduce GHG emission
- Business opportunities and job creation

Promote the reduce, reuse, and recycle

- Extended producer responsibility
- Unit charging programme (or pay as you throw): Republic of Korea
- Integrated resource recovery centres : Matale, Sri Lanka
- National Framework: China's circular (recycling) economy

Issues for discussion

- Q 1: Do you think the concept of eco-efficiency, which means producing more while using less resources and polluting less, is one of the core criteria for infrastructure development in your country?
- Q 2: What is the main gap among government pursuing collective benefits (i.e. saving oil importing costs, reducing pollution), private sector pursuing profit maximization, and people pursuing individual comforts in infrastructure development? And how does this gap hamper shifting towards a sustainable choice?

- Q 3: Do you think the concepts of liveablity and eco-efficiency are compatible with each other in city development? If so, how do you think city should be planned and designed in order to eco-efficient, while improving the quality of lives? Please provide us some specific policy options or examples.
- Q4: Suppose your country is introducing congestion charges or introducing a policy to control the number of private vehicles on the road. Would you support such measures? Please explain why or why not.
- Q 5: What are the main barriers to developing green new buildings as well as retrofitting existing buildings to be more energy efficient?

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- Q 6: Many local governments in Asia-Pacific region spend substantial amount of their budget in collecting waste. Do you think potential budgetary constraints of local government and increasing resource prices will impact on the current way of solid waste management to shift towards 3R approach (reduce, reuse, recycle)?
- Q 7: Do you think your country need to diversify water resources for potential water stress and design city to be resilient towards climate related disaster such as drought or floods? Please introduce policy measures that are already being introduced to address those concerns in your countries.

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