FACT SHEET

Eco-city

Key points

- ***Countries in the region experiencing rapid urbanization have a leapfrogging opportunity to avoid the "grow first, clean up later" model of development.***

- ***Integrating eco-efficiency into city development can be a win-win strategy for governments to yield both energy and ecological security on one hand and economic growth and quality life on the other.***

Eco-city explained

The concept of an "eco-city" was introduced in the 1987 book *Ecocity Berkeley: Building Cities for a Healthy Future* by Richard Register. Similar concepts sprouted around the same time, such as ecopolis, sustainable city, carbon-neutral city, garden city, green city and self-sufficient city. The general purpose behind these movements is to integrate environmental concerns and balance the development of a city within the scope of the carrying capacity of the ecological system.

Eco-city projects started out largely as experiments in which emerging technologies were applied on a small scale. In other cases, incremental improvements were made by simply adding on green areas or reducing the pollution of existing systems. Recent efforts with eco-city development, however, incorporates broader socio-economic plans, such as creating business opportunities and jobs in the green sector, providing eco-efficient public transport and utility services and promoting sustainable land use planning. The following table describes several eco-city models and their features.

Table 1: The types and characteristics of the selected eco-cities models

Type	Description	Examples
Renewable energy city	The city is powered by renewable energy to various scales – from the buildings to the districts and the entire city. Renewable energy can be tapped from such sources as biofuels, sunlight, wind or geothermal, according to the local context. Cities are required to restructure their infrastructure (such as power generation and buildings) and institutions in a way that allows the penetration of renewable energy.	Masdar, United Arab Emirates; Dezhou solar city, China and Vauban, a suburb of Freiburg in Germany
Carbon neutral city; zero-carbon city; low-carbon city	The city aims to be free from carbon emission by improving energy efficiency as well as by replacing fossil fuel with renewable energy sources. There are several initiatives to emit zero carbon on a small scale, such as within a building or at the district level. Greenhouse gas emission reduction has been integrated as an integral part in many eco-city projects.	The U.K. Government mandate that all urban development in the public sector be carbon neutral by 2016 and China's low-carbon cities project
Garden city	The city incorporates intensive greening as part of the urban environment. Green areas can be placed in the lower-density enclaves of a city, such as suburbs, or can be integrated into the urban built environment, such as green roofs. Urban green areas can be also used for urban agriculture, renewable energy crops growing and greening the high-density parts of cities.	A honey bee project now considered as a symbolic urban "satoyama" in Ginza, Japan's commercial district.[1]

[1] Japan for Sustainability, "The Ginza Honeybee Project: Urban Development Inspired by Beekeeping", *JFS Newsletter*, No.86 (October 2009). Available from www.japanfs.org/en/mailmagazine/newsletter/pages/029489.html (accessed 27 January 2012).

Resource-efficient city	The city relies on both upstream and downstream waste management systems. The city encourages the use of sustainable resources in both production and consumption practices while being equipped with citywide infrastructure designed to maximize the 3R habits (reduce, reuse, recycle), waste-to-energy technology and sustainable composting.	Many cities in Japan; the industrial symbiosis in the United Kingdom; China's circular economy and eco industrial parks in the Republic of Korea
Self-sufficient city	Eco-efficiency is realized through localized and self-sufficient production and consumption. The city can save the economic and environmental costs for importing as well as exporting products and services by maximizing the use of available resources inside the city.	The concept of self-sufficiency economy in Thailand and Yusuhara in Japan
Distributed city	The city, relying on small-scale and neighbourhood-based water and energy systems, can save costs occurred in the transmission process of the centralized system.	Small-scale community sewage system in the town of Hill End, New South Wales, Australia, PV-diesel hybrid systems for electrification of 64 schools in Borneo, Malaysia
Smart city	The city uses information technology as part of improving environmental sustainability. For instance, a city can provide real-time information through transport network as well as allow the interactive data management in green building, energy, water and waste system.	Smart city project in Yokohama, Japan

Source: Adjusted from Peter Newman, Timothy Beatley and Heather Boyer, *Resilient Cities: Responding to Peak Oil and Climate Change* (Washington D.C., Island Press, 2009).

Indicators

Various attempts have been made to measure the progress towards creating an eco-city; but many of them tend to touch only on the environmental performance, as the following explains. But going forward, there will be need to have a clear and comprehensive measurement of a city's environmental as well as economic performance and their intrinsic interaction.

- **Asian Green City Index:** Developed by the Economic Intelligence Unit, its first evaluation of 22 major cities (capital and business centres) in Asia covers nine categories with 29 indicators in the areas of energy and CO_2, land use and buildings, transport, waste, water, sanitation, air quality and environmental governance.[2]
- **Global Urban Competitiveness Index:** Developed by the Chinese Academy of Social Science, it provides an annual ranking of 500 cities worldwide in terms of the competitiveness in nine indexes, based on measures of enterprise, industrial structure, human resources, "hard" business environment, "soft" business environment, living environment and global connectivity. The 2010 report includes Beijing, Hong Kong, China, Singapore, Seoul and Tokyo among the top 10 in environment competitiveness.[3]
- **Global Liveability Report:** Developed by the Economist Intelligence Unit, it assesses lifestyle in 140 cities in terms of stability; health care, culture and environment, education and infrastructure.[4]
- **Worldwide Quality of Living Survey:** Developed by the Mercer consulting firm, the survey includes an eco-ranking that is based on water availability, drinkability, waste removal, quality of sewerage systems, air pollution and traffic congestions.[5]

[2] Economist Intelligence Unit and Siemens AG, *Asian Green City Index: Assessing the Environmental Performance of Asia's Major Cities* (Munich, 2011). Available from www.siemens.com/press/pool/de/events/2011/corporate/2011-02-asia/asian-gci-report-e.pdf (accessed 27 January 2012).

[3] Global Urban Competitiveness Project website "The Abstract of 2007-2008 Global Urban Competitiveness Report". Available from www.gucp.org/en/report.asp?bigclassid=2&smallclassid=20 (accessed 27 January 2012).

[4] Economist Intelligence Unit website "Global liveability Report: Melbourne Takes the Crown of Most Liveable City from Vancouver" (2012). Available from www.eiu.com/site_info.asp?info_name=The_Global_Liveability_Report&page=noads (accessed 27 January 2012).

[5] Mercer website "2011 Quality of Living Worldwide City Rankings: Mercer Survey" (29 November 2011). Available from www.mercer.com/press-releases/quality-of-living-report-2011 (accessed 27 January 2012).

- **International Ecocities Framework and Standards:** Currently being developed by Ecocity Builders and its network of Partner Advisers, the standards will allow participating cities to assess their ecological condition in conjunction with a global network of local governments, and a whole-systems improvement process will be taken. An eco-city assessment will have 15 criteria, grouped into natural, social and financial capital: food, energy, ecological integrity, carrying capacity, biodiversity, air, access by proximity or localization, well-being, education, economy, culture, community capacity or participation, water and soil.[6]

Strengths of an eco-city

- **Ecological benefits:** greenhouse gas emission reduction and enhanced environmental resilience via quality of air and reduced heat island effect.
- **Economic benefits:** energy and water securities, business opportunities and job creation potential through investment in the green sector including renewable energy industry, and costs savings from increased resource efficiency.
- **Social benefits:** increased liveability and quality of life.

Challenges to building up an eco-city

- **Lack of awareness:** Because the principles for what an eco-city is have not been fully agreed, there can be a lack of common understanding and thus challenging for policymakers to introduce a comprehensive set of policy measures in an integrated manner.
- **Fragmented institutions:** While the development of eco-cities requires concerted efforts of many actors, inefficient or insufficient institutions following a sector-based approach may hamper coordination for cross-cutting issues, such as integrated land and transport planning.

Implementing strategies

Strong leadership and commitment: The government needs to kick-start the process in the initial stage. China is a good example in which the central Government, the National Development and Reform Commission, leveraged the local government to take up eco-efficiency as a tool for city development via the low-carbon city project in July 2010.

Integrated institutions: Successful planning and design policies depend on setting up the right policy framework and governance structures that fully engage the relevant actors and mobilize the needed financial resources. In Singapore, the Urban Redevelopment Authority (URA) has a critical role in delivering long-term strategic plans that provide guidance and coordinate actors for prudent and sustainable land use.

Information and knowledge sharing: Governments can benefit from the information networks of local governments as well as national and regional networks (see the following box). Planning and design measures can be a starting point for developing the physical structure of eco-cities.[7]

[6] Ecobuilders website "International Ecocity Framework & Standards Initiative: IEFS Indicator Development" (2011). Available from www.ecocitystandards.org/ecocity-level-1-conditions/iefs-indicator-development (accessed 27 January 2012).

[7] The fact sheets on compact development, cellular development, integrated land use and transit planning, preservation of open and green space and walkability provide more detailed guidance.

BOX 1: Annual conferences on eco-city development

Maintaining up-to-date working knowledge of the latest techniques, strategies and policies towards achieving sustainability helps local governments in ensuring smart and green growth, as the following examples highlight:

- **Ecocity World Summit:** Since 1990, the Ecocity World Summit has promoted the theme of the sustainable city (the first conference, in Berkeley, California (USA) focused on cities that changed hearts and minds). The conference has since taken place in Adelaide, Australia, in Dakar/Yoff, Sénégal, in Curitiba, Brazil, in Shenzhen, China, in Bangalore, India, in San Francisco, United States of America and in Istanbul, Turkey (www.ecocity2011.com).

- **Sustainable Cities Conference in Singapore:** The third Sustainable Cities Conference in 2011, organized by IBC Asia with the theme of Building Liveable Cities of the Future through Green Design and Good Governance, explored how good design and planning can improve city management, drive economic growth, promote sustainable development and deliver a better quality of life. Leading experts from industry, academia and governments examined pressing issues affecting property development and the green business with Asia's urban population boom (www.sustainablecitiesasia.com).

- **Green Cities:** Started in Sydney in 2007, Green Cities is an annual event jointly hosted by the Green Building Council of Australia and the Property Council of Australia. This event has venues in Sydney and Melbourne and attracts national and international green building professionals (http://greencities.org.au).