



Green buildings in China

Observations of a booming nation

By Peter Love



This is a column that will be exploring new ideas, trends and developments in environmental matters related to buildings.

This first column combines two topics familiar to everyone on their own but not together. It is based on a recent trip to China to speak at an international low-carbon conference and to follow up on earlier meetings with building inspection officials from China during a Canadian study tour.

Four cities were visited over two weeks: Chongqing (population 31 million, largest in China), Yichang (6 million, beside the 22,000 MW Three Gorges hydro station which is about 10 times the generation capacity of Ontario stations at Niagara Falls), Dalian (6 million, the greenest city) and Beijing (22 million with no less than five ring roads).

Firstly, a few general observations on China. There is very little police/military presence and no apparent slums with 25 to 30 year old buildings being demolished to make way for new buildings. Air quality in the biggest cities remains a huge issue but at least when I was there in the fall, it was less irritating than what I have experienced with “bad air” days in Los Angeles and Mexico City.

At the macro level, the most far reaching environmental initiative in China is the recent five-year plan. This is the 12th such plan and based on the history of the past 11, it can be expected that its targets are much more likely to be exceeded than not.

The numbers are staggering; 7 percent/year growth in the economy, 40 per cent increase in GDP, 45 million new jobs (many in the emerging green economy) and 36 million new low income apartment units. Past economic growth, which has averaged 10 per cent annually, has resulted in 440 million Chinese being lifted out of poverty representing the biggest reduction of poverty in world history.

Energy conservation is one of the six primary economic policy tools that will form the basis for the overall strategy. The target is a 16 per cent reduction in energy intensity and 70,000 MW of new renewable electricity generation capacity (more than twice the size of

Ontario’s current grid). A major weakness of this plan, from an environmental perspective, is its continued reliance on coal (which it will try to make cleaner and more efficient), nuclear (the plan was completed before Fukushima Daiichi) and shale gas.

At the city level, the government refers to the development of 149 “eco-cities”. In 2001, the UN named Dalian China’s first “Model Environmental City” (only the 2nd in Asia). In Dalian’s new BEST (Biodiverse Emerging Science Technology) City, a 150,000 m² green office building has already been completed with other green buildings to follow in what city officials refer to as “an ecological Silicon Valley”. Although initial attempts to develop “eco cities” in Dongtan and Huangbaiyu (U.S. architect William McDonough of “Cradle to Cradle” fame worked on the initial design) were not successful, Tianjin Eco City (estimated population 350,000 by 2020, 140 km. southwest of Beijing) appears to be on track.

At the individual building level, its last five-year plan required energy savings of 50 per cent for new buildings nationwide and up to 65 per cent for buildings in Beijing, Shanghai, Tianjin and Chongqing.

The first LEED certified building was the Agenda 21 office in Beijing where two agencies of China’s Ministry of Science and Technology are located. With technical assistance from the U.S. non-profit NRDC (Natural Resources Defense Council), this building uses 74 per cent less energy compared with a conventional office building.

One of the most well known is the Olympic Village with which NRDC also assisted and achieved a LEED-Neighbourhood Development Gold certification. There are now about 400 LEED certified buildings in China.

One example is a life science and technology centre in Beijing that is certified LEED Silver and was designed by B+H with collaboration between its Toronto and Shanghai offices.

China has also developed its own Green Building Design label (GBDL)

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that awards one to three stars. Although this program has many of the key attributes of the internationally-recognized LEED program, its certification requirements are much less rigorous as only an independent review of the proposed design is required.

At the residential level, although most new home construction in China is apartments/condos, one particularly interesting demonstration project is the “Low Carbon Cottage” in Nanguan Park in downtown Beijing. In addition to what you might expect to see (solar domestic hot water collector, thick insulation on walls/ceiling, heat pump, energy efficient lights/appliances), it also featured a series of videos that played on the bed and stove top that illustrated conservation behaviour such as walking to school, using a small covered pot to boil water, etc.

Important improvements are also being made in the retrofitting of existing buildings. An important development is the creation of the China Energy Management Company Association (EMCA) which is its national energy service company association that promotes the use of energy performance contracts. These are contracts where private companies finance an energy retrofit and repaid through the annual energy savings that is guaranteed.

One example of such an initiative is the Sino-French Training Centre for Energy Efficiency (CFFCME) at the Beijing Civil Engineering and Architecture University where a recent energy efficiency retrofit by Terao (a French company) is expected to reduce energy for heating the building by 65 per cent.

While certainly there are government attempts at green washing in China, as there is here in Canada, real progress is being made and it will be important to continue to monitor developments in China for both the new products/processes that are developed as well as the impact it will have on the world’s green house gas emissions. BS&S

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