

Energy Co2 : Energy Efficiency

Green Foundation for a New Architecture

What is the most important source of greenhouse gas emissions - transportation or industry? Neither. Surprisingly, buildings are responsible for the biggest share. The good news: no other sector offers a cheaper ways to cut emissions and save energy.



Green Architecture

The Swiss Re Tower (aka "the Gherkin") in London is one of the world's most recognizable "green" buildings (Photo: Reuters)

Russia is known for its cold winters. But with the luxury of cheap gas, Russian buildings have gradually become badly insulated, overheated and inefficient consumers of energy. A study from the Russian Center for Energy Efficiency finds that Russian buildings are either over- or under-heated, and often consume up to 50 percent more heat and hot water than needed. Fifty-three percent of all carbon dioxide (CO₂) emissions in Russia stem from heating and generating electricity for buildings.

While Russia is an extreme example, the problem of inefficient buildings is ubiquitous. According to the Pew Center on Global Climate Change, buildings are the single-most important source of greenhouse gas emissions in the United States, representing 43 percent of all CO₂ emissions. The energy required to build, heat, cool, light, and power appliances in buildings results in more CO₂ emissions than transportation (32 percent of CO₂ emissions in the United States) and the industrial sector (25 percent).

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The United Nations Environment Programme (UNEP) released a report in April 2007 highlighting the importance of energy efficient buildings in the global campaign to combat climate change.

"By some conservative estimates, the building sector worldwide could deliver emissions reductions of 1.8 billion tons of CO₂," says UNEP Executive Director Achim Steiner. "A more aggressive energy efficiency policy might deliver over two billion tons or close to three times the

amount scheduled to be reduced under the Kyoto Protocol."

The UNEP report, entitled *Buildings and Climate Change: Status, Challenges and Opportunities*, said that applying ambitious standards could yield quick results. Europe, for example, could reduce a fifth of its energy consumption and 45 million tons of CO₂ per year by 2010 through better efficiency in new and existing buildings.

"We have a job ahead of us"

"If we don't get a handle on the building sector, we just don't make it," says U.S. architect Ed Mazria speaking about ambitious long-term goals to cut greenhouse gases. Mazria, founder of the Architecture 2030 Challenge to promote solutions to reduce emissions, aims for a carbon-neutral building sector by 2030.

"It's the building sector that is rising at one and a half to two percent a year in terms of carbon emissions," says Mazria. "We have a job ahead of us."

There are already a few high-profile projects focused on cutting emissions from buildings. In May 2007, the Clinton Climate Initiative launched the Energy Efficiency Building Retrofit Program, a five billion-dollar project that will reduce energy consumption in existing urban buildings with the involvement of city governments and corporate investment.

Sustainable building practices have gone mainstream over the last years. Prominent buildings, such as the Swiss Re "Gherkin" building in London or the renovated Reichstag (Parliament) in Berlin, serve as famous examples of green buildings. Builders are now completing a stadium in Beijing for the 2008 Olympics that will showcase the latest in ecological building technology. Designed by Swiss architects Herzog & de Meuron, Beijing National Stadium will incorporate solar power, rainwater collection and innovative ventilation systems.



Green Architecture

The Reichstag Parliament building in Berlin is equipped with solar panels and efficient ventilation, heating and cooling systems (Photo: Reuters)

But environmentally friendly architecture does not have to be grand and expensive. Many commercial buildings and homes are incorporating smaller-scale energy saving strategies into their building or renovation plans. Beyond pride in living and working in an ecologically friendly building, many companies and homeowners make the switch to energy saving houses because it saves money in the long run.

According to the U.S.-based Green Building Initiative, such buildings are

energy-efficient, minimize pollution and reduce overall environmental impact. They require less maintenance, reduce short- and long-term costs, promote health among occupants and improve worker satisfaction.

Less risk, smaller premiums

A number of standards like the Leadership in Energy and Environmental Design (LEED) from the U.S. Green Building Council certify efficient and sustainable architecture. LEED certifications take into account site development, water savings, energy efficiency, materials selection, and indoor environmental quality. Germans, for example, are familiar with the concept of the passive house that uses super-insulation to dispense with conventional heating systems.

In early 2007, the building with the highest LEED rating was the St. Louis headquarters of construction company Alberici. The office building supplies 18 percent of its energy from an on-site wind turbine and uses landscaping, rainwater, and solar energy.

LEED or otherwise certified buildings are not just more efficient, they also carry less risk. In October 2006, Allianz subsidiary Fireman's Fund became the first U.S. insurer to integrate this statistical fact in its policy by offering a discount for LEED-certified buildings. An upgrade package even allows owners to rebuild conventional buildings using green architecture and technology.

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