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# A more effective policy framework for the building sector

**This article reports on a recent study of the Energy Efficiency in Buildings project of the World Business Council for Sustainable Development that highlights the need for a more effective policy framework for the building sector. This will be vital in order to kick start the industry into action to slash the energy use in buildings. The technology and knowledge already exist, yet action has been woefully slow.**

## INTRODUCTION

Buildings can make a major contribution to tackling climate change and energy use, but the lifespan of buildings means we need to act now. We can start to act now because we have the knowledge and technology to slash the energy buildings use. Why is this not happening?

The Energy Efficiency in Buildings project of the World Business Council for Sustainable Development tries to answer that question. We published a Facts & Trends Summary Report in 2007 which identified three kinds of barriers preventing energy reductions in buildings:

behavioural, organisational and financial. The report also outlined three approaches to overcome them:

- ▶ Encourage interdependence by adopting holistic, integrated approaches to whole communities and individual buildings.
- ▶ Make energy more valued by those involved in the development, operation and use of buildings.
- ▶ Transform behaviour by educating and motivating professionals involved in building transactions.

## COMPLEXITY IN THE BUILDING INDUSTRY

The building market is diverse and complex. The commercial relationships between the many specialists involved are intricate and critical in sparking action on energy efficiency. The sector is characterised by fragmentation within sections of the value chain and non-integration among them. Even the largest players are small and relatively local by international business standards, with the exception of materials and equipment suppliers. Incentives to reduce energy

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## THE EEB VISION

The EEB vision is a world in which buildings consume zero net energy. That is ambitious, but we believe a high ambition is necessary to achieve the progress needed to address climate change and energy use. Zero net energy means buildings as a whole (but not every individual building) would generate as much energy as they use over the course a year.

use are usually split between different players and not matched to those who can save the most through energy efficiency. The complexity of interaction among these participants is one of the greatest barriers to energy efficient buildings.

## KNOWLEDGE GAPS IN THE INDUSTRY

The EEB project commissioned research that revealed serious gaps in knowledge about energy efficiency among building professionals, as well as a lack of leadership throughout the industry. We found that people believe financiers and developers are the main barriers to more sustainable approaches.

In general, we found that people recognise sustainable buildings are important for the environment but underestimate buildings' contribution to greenhouse gas emissions. They also generally overestimate the cost premium, which is likely to be under five per cent in developed countries.

Awareness of environmental building issues is relatively high in all countries we researched, but few people have been directly involved. Our research identified four factors that are the main barriers to greater adoption of sustainable building by building professionals:

- ▶ Personal know-how – whether people understand how to improve a building's environmental performance and where to go for good advice.
- ▶ Business community acceptance – whether people think the business community in their market sees sustainable buildings as a priority.
- ▶ A supportive corporate environment – whether people think their company's leaders will support them in decisions to build sustainably.
- ▶ Personal commitment – whether action on the environment is important to them as individuals.

## ACHIEVING CHANGE

The knowledge, technology and skills are already available but are not being widely used to achieve dramatically lower energy use in buildings. Progress is hampered by barriers in the form of industry structure and practices, professionals' lack of know-how and support and a lack of leadership.

The EEB project believes that a more effective policy framework would help to stimulate activity. Businesses in the building industry need a supportive policy and regulatory framework to achieve dramatic improvements in energy efficiency. This is supported by the project's research findings on industry leadership, which reveal that many building industry professionals only adopt new practices if they are required by regulation.

Governments need to concentrate on the most efficient and cost-effective approaches. Research for the UNEP Sustainable Buildings and Construction Initiative (SBCI) found that the most effective instruments achieve net savings for society and that packages of measures combining different elements are desirable. The study identified policies that were both cost effective and successful in reducing emissions.

A better policy framework would cover:

- ▶ Urban planning.
- ▶ More effective building codes to enforce minimum required technical standards.
- ▶ Information and communication, to overcome the lack of know-how and to highlight the energy performance of individual buildings. A combination of voluntary and mandatory schemes is already emerging, for example: voluntary labeling schemes such as CASBEE, Japan, and LEED, US, and the building 'energy passport', EU.
- ▶ Tax and other incentives to encourage energy efficiency in building equipment, materials and occupation.
- ▶ Energy pricing to make energy more valued by users, to decouple utilities' revenues from the volume of energy supplied and to encourage local and renewable generation. For example, electricity consumers in Germany receive credit for power fed into the grid from local generation at a rate four times the cost of the electricity they use from the grid.
- ▶ Enforcement, measurement and verification to make sure policies and regulations (including building codes) are effective and support market measures such as trading.

## A HOLISTIC APPROACH

While an effective policy framework is important, it will not be enough on its own. EEB research also identified the need for a holistic approach to construction, new financial approaches and behaviour changes.

A holistic approach begins with master planning and considers energy use over the whole life cycle and embraces integrated building design processes. Master planning considers the community in its entirety as well as single buildings. Some new urban centres are being created from scratch with an entirely sustainable plan, such as Dongtan near Shanghai, China, and Songdo, Korea. But many existing and rapidly growing cities have little room to manoeuvre due to existing constraints. In that case, master planning has to be implemented within the existing urban environment.

## EEB CORE GROUP COMPANIES

The EEB project has brought together 10 leading companies (CEMEX, DuPont, EdF, GdF, Kansai, Lafarge, Philips, Sonae Sierra, Tepco and UTC) in the global building industry to tackle this vitally important subject. The project is led by Lafarge, and United Technologies. The EEB project covers six countries or regions that are together responsible for two-thirds of world energy demand, including developed and developing countries and a range of climates: Brazil, China, Europe, India, Japan and the United States.

## ENERGY USE IN BUILDINGS

Energy efficiency factors in buildings vary according to geography, climate, building and location. The distinction between developed and developing countries is important, as is the contrast between retrofitting existing buildings and new construction. In some cases, there are different standards of building quality. It is vital that energy efficiency permeates all levels and is not restricted to high end properties.

This complexity means it is impossible to develop a single solution for all markets and cultures. Instead, the EEB project aims to identify approaches, market factors and policy initiatives that will together achieve the needed results.

Climate change will increase site energy demand as people seek to maintain comfort levels in more extreme conditions. Other main drivers pushing energy use up include demographics, economic development, lifestyle changes and technology.

## Integrated Design Process

Many professionals are involved at different stages of a design project, and many factors need to be taken into account: climate, building shape, comfort levels, materials and systems, occupant health and security. Most projects follow a sequential approach, finalising one stage before moving to the next, with fee structures aligned to this linear approach and compartmentalisation. Designers need to be able to carry out extra iterations, revisiting earlier stages, to optimise the many factors and introduce cost-effective innovations at an early stage.

An Integrated Design Process (IDP) involves all participants in the early design phase of the project. Multidisciplinary workshops bring together owners, architects, engineers and others. They cooperate across the different specialties rather than working in the traditional 'silo' approach that involves little communication between specialists and results in buildings with sub-optimal performance.

IDP can achieve improved building performance with lower costs and fewer disruptive changes during the later project stages. The earlier in the process that IDP occurs, the greater the impact on building performance and the lower the impact on costs.

## FINANCE

Financial considerations are critical to property development and investment, but they appear to be limiting the advance of energy efficiency. Financial pressures have become more powerful, especially in the US, because of the rise of real estate as an investment class and a decline in the number of owner-occupied buildings. Investors' time horizons are likely to be short. This increases the importance for their investment calculations of the property's residual value when they sell compared with operational returns during their ownership.

There is some evidence that an energy efficient building can command a premium, and this may increase as awareness of climate change and expectations of rising energy costs leads people and organisations to attach more value to energy efficiency. In the US, buildings with high energy performance are becoming more attractive financially because of markets for renewable energy (in 20 states as of mid-2007) and energy efficiency credits (10 states).

## THE COST OF ENERGY AND ENERGY EFFICIENCY

Energy is typically a small proportion of total occupancy costs for buildings and this limits the incentive to invest in energy efficiency. For example, in a high quality office building in Germany, heating and electricity made up less than five per cent of the total operating cost of the building, including rent and maintenance.

This is particularly disappointing given that the cost of energy efficiency can be quite low. For commercial properties, the Fraunhofer Institute has shown that the energy demand of new office buildings can be reduced by 50 per cent compared with the existing building stock without increasing construction costs. The US Green Building Council has performed numerous studies and concluded that the cost of reaching certification under its Leadership in Energy and Environmental Design (LEED) standards system is between zero and three per cent, while the cost of reaching the highest level of LEED (platinum) comes at a cost premium of less than 10 per cent.

## CONCLUSION

Design and technology available today can achieve dramatic improvements in building energy efficiency, but market failures and behavioural barriers are blocking progress toward the EEB vision of zero net energy.

It is the responsibility of Governments to set the global long term pathway to a low carbon future. Building is a key to reduce CO<sub>2</sub> and an effective and robust policy framework that helps the building sector to overcome its barriers could mainstream the market towards green buildings.

### Author

Christian Kornevall joined the WBCSD in October 2005 to head the Energy Efficiency in Buildings project. Previously, he was Senior Vice President, Group Function Sustainability Affairs at ABB. He has also worked at WWF, the International Committee of the Red Cross, the International Labour Union (ILO) and the Swedish International Development Authority (SIDA). Originally from Sweden, Christian studied Economics, Business Administration and Statistics at Stockholm University before exploring the world on various assignments in South America, Asia and Europe with the above mentioned employers.

### Organisation

The World Business Council for Sustainable Development (WBCSD) is a CEO led, global association of some 200 companies dealing exclusively with business and sustainable development. The Council provides a platform for companies to explore sustainable development, share knowledge, experiences and best practices, and to advocate business positions on these issues in a variety of forums, working with governments, non-governmental and intergovernmental organisations.

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