

DESIGN OF SUSTAINABLE BUILDING POLICIES: SCOPE FOR IMPROVEMENT AND BARRIERS

EXECUTIVE SUMMARY

The building sector accounts for about 30% of primary energy use in OECD countries....

The building sector has a major impact not only on the economic and social aspects of human activities, but also on the natural and built environment. Along with the transportation sector, the residential, commercial and service sectors have registered a considerable increase in CO₂ emissions in the 1980s and 1990s, while the proportional contribution of CO₂ emissions from the industrial sector actually decreased. At present, the operation of residential and commercial buildings is responsible for about 30% of primary energy use in OECD countries.

...and for up to one-half of commodity flows.

With regard to material use, material flow analyses for some OECD countries show that the construction sector accounts for between one-third and one-half of commodity flows when expressed in terms of weight. Consequently, there has been a considerable amount of construction and demolition waste generated from building activities in OECD countries.

We spend as much as 90% of our time indoors.

In addition to the impacts associated with the construction of buildings, there are also social and environmental impacts from building use. Health problems resulting from indoor air pollution have become one of the most acute environmental problems related to building activities. Studies of human exposure to air pollutants indicate that the levels of many pollutants may be 2.5 times, and occasionally more than 100 times, higher indoors than outdoors. These levels of indoor air pollutants are of particular concern because it is estimated that most people spend as much as 90% of their time indoors.

This study identifies barriers to improvements in the construction sector's environmental performance.

Under such circumstances, the impact of the building sector on the environment could be reduced significantly by improving the design of environmental policies for the sector. The aim of this report is to establish an analytical framework to discuss policy design for the construction sector by identifying the scope for improvement in the sector's environmental performance and barriers to such improvements. Of the various environmental issues related to the building sector, this study focused on the following three environmental objectives:

- Reduction in CO₂ emissions.
- Waste minimisation.
- Prevention of indoor air pollution.

The building sector has several unique characteristics which could affect the way barriers are overcome.

The identification of barriers in the study was carried out by a three-step methodology. First, the improvements to environmental characteristics of buildings and building activities needed to attain specific environmental objectives were identified. The second step analyses the kind of actions required of stakeholders to attain the improvements in the environmental characteristics. Then barriers to improvements are highlighted by examining why the required actions are not undertaken without government policies in the third step. In this analysis, special attention is paid to several unique characteristics of the building sector which could affect the way barriers are overcome (e.g. long-lived nature of products, extended life cycle, discrepancy between owners and users, spatially fixed nature of products, etc.).

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On this basis, conclusions are drawn on the main barriers to the improvement of environmental characteristics of buildings and building activities. The main conclusions include:

Potential buyers often do not have sufficient information.

- Because of the infrequency of transactions in the market – due to the high capital cost of building construction and the difficulty of comparing the efficiency of buildings because of the heterogeneity of their design – potential buyers often do not have sufficient information to make a rational investment choice.
- The building industry is characterised by the dominance of small-scale firms, which often do not have the technical expertise necessary to improve the energy efficiency of buildings.

Buyers tend to pay little attention to energy costs.

- It is often estimated that the additional cost for upgrading energy efficiency will be recovered through the reduced cost of energy in the long run. However, from the viewpoint of clients, there are several uncertainties – such as possible changes in energy prices and climate as well as changes of ownership – which lead clients to place a disproportional emphasis on the reduction of capital costs instead.
- When buildings are rented, owners of buildings have little incentive to improve the energy efficiency of their buildings.

There is little incentive for recycling and reuse.

- Potential buyers of buildings have little incentive to consider the recyclability/reusability of building materials and components because demolition will take place in the distant future, often by other individuals or firms.
- Sufficient information on the quality of secondary building materials is often not provided to potential users. Such materials are generally considered only reluctantly, because they are viewed as materials of dubious characteristics deriving from unproven sources.

There remain unanswered questions regarding the causal mechanism of indoor health problems.

- In the absence of government policies, demolition contractors and their clients do not have sufficient incentives to give priority to recycling/reuse of the construction and demolition waste. In the short run, they generally do not incur the costs associated with the environmental impacts of the landfill or incineration of the waste.
- With regard to indoor air pollution, there are still some questions that have not been clearly answered regarding the causal relations.
- Sufficient information on possible polluting emissions from building materials is not provided for designers, owners and users of buildings.

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For more information about the **OECD’s work on sustainable buildings**, contact :

Takahiko Hasegawa, Environment Directorate

Email – takahiko.hasegawa@oecd.org ; Fax : +33 1 44 30 61 79

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