ENERGY EFFICIENCY FOR BUILDINGS

Buildings use about 40% of global energy, 25% of global water, 40% of global resources, and they emit approximately 1/3 of GHG emissions. Yet, buildings also offer the greatest potential for achieving significant GHG emission reductions, at least cost, in developed and developing countries. Furthermore, energy consumption in buildings can be reduced by 30 to 80% using proven and commercially available technologies.

Key Facts

- The building sector is estimated to be worth 10% of global GDP (USD7.5 trillion) and employs 111 million people.
- Residential and commercial buildings consume approximately 60% of the world's electricity.
- Existing buildings represent significant energy saving opportunities because their performance level is frequently far below current efficiency potentials.
- The building sector is the largest contributor to global GHG emissions.
- In developing countries, new green construction yields enormous opportunities. Population growth, prosperity and increasing urbanization fuel building and construction activities, which represent up to 40% of GDP.
- Investment in building energy efficiency is accompanied by significant direct and indirect savings, which help offset incremental costs, providing a short return on investment period.
- Building sustainably will result in healthier and more productive environments.

Given the massive growth in new construction in economies in transition, and the inefficiencies of existing building stock worldwide, if nothing is done, greenhouse gas emissions from buildings will more than double in the next 20 years. Therefore, if targets for greenhouse gas emissions reduction are to be met, it is clear that decision-makers must tackle emissions from the building sector. Mitigation of greenhouse gas emissions from buildings must be a cornerstone of every national climate change strategy.

The construction, renovation, and maintenance of buildings contribute 10 to 40 percent of countries' Gross Domestic Product (GDP), and represent on a global average 10 percent of country-level employment. If carefully planned, greenhouse gas mitigation strategies for buildings can stimulate the growth of new businesses and jobs, as well as contribute to other, equally pressing, social development goals, such as better housing and access to clean energy and water. Decision-makers should seize the opportunity offered by the climate change crisis to build the foundation for sustainable development today and for the future.

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ENERGY EFFICIENCY FOR BUILDINGS

Improving the Energy Efficiency of New & Existing Buildings

Broadly speaking, the energy efficiency of a building is determined by the rate at which energy is lost through the physical structure of the building (the building envelope), and the rate at which energy is used to meet the energy needs and physical comfort of the occupants. These two factors are often closely interrelated, because the physical structure and design of a building, interacting with the local climate, strongly influence the choice of energy system and the associated efficiency of that system. When considering initiatives to improve the energy efficiency of buildings, therefore, it is important to keep both factors in mind.

Energy performance contracting (EPC) means that a contractor, typically an energy service company (ESCO), guarantees certain energy savings for a location over a specified period; implements the appropriate energy efficiency improvements; and is paid from the estimated energy cost reductions achieved through the energy savings. EPC can be a useful vehicle for implementing and financing energy efficiency projects in buildings because no public spending or market intervention is needed to capture the cost-effective energy-efficiency potential and competitiveness can be improved.

However, a number of conditions must exist for an effective ESCO industry to thrive, such as a mature financial sector willing to lend for energy efficiency projects; unsubsidised energy prices; and supportive legal, financial and business environments. To date, ESCOs have been shown to work effectively in Germany, the United States and Hungary, as well as in China and Brazil, but have been less successful in some other countries. To date, most ESCO projects in developing countries have been financed by bilateral and multilateral donors.

Energy Efficient Buildings in Developing Countries

The Building Sector has tremendous potential for reducing greenhouse gas emissions, and at relatively low cost. However, for developing countries, it is clear that a much broader range of financing options need to be explored, including through international mechanisms such as the CDM and public-private partnerships. Many developing countries must grapple with the dual challenge of greenhouse gas mitigation and climate change adaptation in their Building Sector. However, developing countries may also combine their efforts at addressing the challenges that climate change poses with their overall sustainable development goals, such as those outlined in the Millennium Development Goals.

No one group of stakeholders, whether researchers, project developers, policy-makers, public donors or private investors, can do everything, but everyone can, and must, do something. Recognizing the different conditions, in terms of climate, culture, tradition, economic systems and availability of materials, which apply to the building sector in different countries, it is clear that there can be no universal solution or recommendation that can be given for reducing greenhouse gas emissions from buildings. However, there has never been a time when interest in addressing the issue of emissions from buildings has been greater, and decision-makers should draw on the good will, support and expertise of all stakeholders to implement their greenhouse gas emission reduction strategies.

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