APSF ENVIRONMENT

February 2011 | Page 1/4

An occasional Brief published by EU-India Action Plan Support Facility, Environment Component, Technical Assistance

Dialogue on Green Buildings: Policy and Practice within the European Union and India

The Ministry of Environment and Forests (MoEF) recognizes the importance of green buildings and the role they play in improving energy efficiency in the building and construction sector. It has identified energy efficiency, with particular focus on green buildings, as a key area for India and the European Union (EU) to share experiences on. Dialogue on this subject is intended to lead to the identification of steps towards the formulation of a green building framework, particularly the development of policies, legislation and codes for better energy-efficient buildings.

Concept of Green Buildings

The inclination towards sustainable buildings (commonly referred to as "green" buildings) originated from the desire and need to improve building practices to those that:

1. **respect the natural environment** – by considering water and energy use, development location, land use, habitat impacts, raw material use and solid waste minimisation;
2. **provide safe, comfortable and accessible accommodation for occupants –** by open development design, provision of high quality indoor environmental conditions (such as day lighting levels, ventilation and temperature control) and access to sustainable transport provisions; and
3. **are economical to design, construct and operate –** using a whole life costing approach that accounts for ongoing costs over the life of the building (such as operations, maintenance, depreciation and replacement costs) in addition to the initial costs of a building (such as design and construction costs).

Green Buildings in India – Current Practice and Standards

Spurred by increasing per capita income and standard of living, the Indian construction industry has experienced an annual 10% growth in gross built-up area over the past decade. Demand for housing continues to increase; organized retail is expanding, as is retail, commercial and office space, especially by multi-nationals; and special economic zones are being set up.

Therefore, energy consumption and emission of associated greenhouse gases will continue to rise, unless actions are taken urgently to direct the construction industry towards sustainable consumption and energy production.

In a positive step towards this direction, the Government of India has announced several energy efficiency and energy security initiatives: along with enhanced energy access of the wider environmental aspects of green buildings such as water and materials minimisation.

The Energy Conservation Building Code (ECBC) 2007, formulated by the Bureau of Energy Efficiency (BEE), sets minimum energy performance standards for new commercial buildings. A voluntary code, it aims to reduce baseline energy consumption. The ECBC has been seen as such an important and powerful code in improving building energy efficiency that in some areas of India, such as New Delhi, it has been approved for mandatory implementation.

The National Sustainable Habitat Mission emphasizes the extension of the ECBC and energy efficiency into the mainstream by suitably incorporating it within municipal byelaws.

Several states and municipal corporations have also launched initiatives on energy efficiency and renewable energy integration. These include compliance with ECBC and mandatory incorporation of solar hot water systems.

GRIHA (Green Rating for Integrated Habitat Assessment), developed to rate new commercial, institutional and residential buildings in India, fully integrates and mandates compliance with the ECBC. It encourages optimization of building design to reduce conventional

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energy demand. It further recommends the optimization of the building's energy performance within specific comfort limits. A built-up area of over 9 million square metres has been registered under GRIHA. The Environmental Impact Assessment and environmental clearance process for large construction projects mandated by the Ministry of Environment and Forests requires compulsory compliance with the ECBC for projects and buildings that fall under its purview.

The BEE has also addressed the residential sector, since equipment and appliances contribute significantly to energy use. The Bureau has introduced an appliance-specific standards and labelling scheme that lays down minimum energy performance standards. The scheme is currently voluntary for washing machines, direct-cool refrigerators, electric motors and pumps, colour televisions, LPG stoves, electric geysers and ceiling fans. For frost-free refrigerators, room air-conditioners, tubular fluorescent lamps and distribution transformers, the scheme has been mandatory since January 2010.

A **scheme to rate office buildings** on their energy performance has also been developed and launched by the BEE.

Industry leaders have also taken an independent role in developing and implementing **Leadership in Energy and Environmental Design (LEED)** across India. LEED, originally developed by the United States Green building Council, offers a platform for ECBC integration as well.

Extensive **capacity building** is being taken up to ensure that the mechanisms in place are understood and complied with suitably by all relevant stakeholder groups. However, in addition to bridging the knowledge gap at various levels, there is a **need for stronger enforcement of government policies and initiatives** as well.

Best Practices from the EU

A growing number of green building initiatives, emerging from both EU member states and across the globe, are redefining traditional approaches to both residential and non-residential buildings and making a positive change to lifestyles. In some member states, as in many non-EU nations, industry leaders have taken an independent role in the development and/or implementation of green building standards through rating systems such as the BRE Environmental Assessment Method or LEED, whereby buildings are recognised for their sustainability credentials and operational performance against set criteria.

Within the EU, 40% of the final energy demand is attributable to buildings, and over half the electricity generated uses greenhouse gas-emitting fossil fuels. Thus, energy efficiency and minimization of energy use play a significant role in building "green".

Energy Efficient Buildings

Energy efficiency is a priority area within energy policy because of its potential contribution towards achieving EU energy security objectives and the meeting of Kyoto Protocol targets through its own climate change strategy.

Reduced energy demand can only be a positive contributor towards energy security. This, coupled with improved energy efficiency, also supports the

Figure 1: Manchester Civil Justice Centre, UK – provides environmental solutions through the integration of engineering and architecture. Awarded a 'BREEAM Excellent' rating

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achievement of the EU Climate and Energy objectives, namely the reduction of greenhouse gas emissions by 20% by 2020.

Rationalisation of building energy demand through EU level policy and member state standards (be they mandatory or compulsory) is under way. The EU has led the way towards reducing building energy demand by adopting the Directive on Energy Performance of Buildings in 2002 (2002/91/EC), commonly referred to as the EPBD.

The EPBD is seen as the most powerful instrument developed to date for the building and construction sector. In summary, the EPBD states that member states shall:

- apply minimum requirements as regards the energy performance of their new and existing building portfolios;
- ensure certification of building energy performance (illustrated below); and
- enforce regular inspection of boilers and air conditioning systems within buildings to ensure they are operating efficiently.

The EPBD applies to new buildings or existing buildings that are subject to major renovations. It is estimated that proper implementation of the EPBD will yield a savings of 40 megatons of oil by 2020. This equates to an 11% reduction in final EU energy consumption.

The EU reports that implementation of the EPBD is *"progressing well in those member states that have existing regulatory frameworks for building efficiency"*. (Source: http://www.euractiv.com/en/ energy-efficiency/green-buildings /article-163411).

Figure 2: Energy Efficient Building with Integrated Solar Power, Freiburg, Germany – Freiburg's energy policy has three pillars: energy conservation, use of new technologies and the use of renewable energy.

Of late, Ireland, Denmark, the Netherlands and the UK are making good progress. Germany is seen as a leader in the field of building efficiency, with cities such as Freiburg leading the way and providing best practice examples on which federal building efficiency laws are based. In April 2007, the German EU Presidency also proposed the creation of an "energy passport" for buildings to ensure transparency in the market on energy efficiency.

In terms of economic support, the UK, like Germany, is eliminating administrative and financial difficulties to the installation of "micro" power generation facilities (such as solar power) in private homes.

Unfortunately, many member states have not made equally swift progress in the implementation of the EPBD and have chosen to delay implementation. A clause in the directive allows member states to delay implementation for three years if there is a lack of "accredited experts" to produce energy certificates.

Member states are, however, supported by the Energy Demand Management Committee, among others. This was set up under the EPBD to monitor implementation progress.

Outside the legislative framework, the

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EU has some major technical and non-technical programmes to help further promote energy efficiency within buildings. This includes the provision of funds and technical action groups from which EU member states can share knowledge and actively collaborate to share implementation experiences.

These programmes continue to play an important facilitative role. They have helped bring experts from around the EU together to find common solutions to minimising energy use within the buildings sector, while also tackling the wider issues associated with building "green".

Discussion Points for Potential Action in India

India has both the need and the potential to build upon its current position with regard to green building design; learning from the global experience will help it achieve progress.

Based on best practices evolved within both the EU and the wider global community, the following represents a summary of issues and relevant discussion points, likely to form the basis of follow-up reporting:

1 Benefits and challenges of integrating the Energy Conservation Building Code within all building approvals, irrespective of its size or use.

2 With regard to green buildings and intrinsic issues within (e.g. energy efficiency), mechanisms for co-ordinated actions throughout India (i.e. national, regional, community and building level).

3 Benchmarking buildings to determine level of performance improvement and the practicalities of implementation, as India has varied regional climates.

4 Financial incentives and funding mechanisms for implementation of green building design, construction and operation.

5 Sufficiency and distribution of knowledge within India to implement measures and systems to improve sustainability standards of buildings.

6 Monitoring, management and verification of green building implementation measures.

7 Raising citizen awareness of green building issues with a particular focus on mechanisms for changing occupant behaviour.

8 Undertaking extensive capacity building of professionals for providing inputs to upcoming projects.

9 Integrate initiatives of various government bodies and agencies along with capacity-building of the government officials for suitable action.

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For the full document, please consult the project's website

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This project is funded by the European Union and implemented by Euroconsult Mott MacDonald, Arnhem, The Netherlands, in consortium with DHI, WWF, CEE, Toxics Link and TERI.

The Ministry of Environment and Forests represents the Government of India as counterpart for the implementation of the project.

The project period is from December 2007 until June 2011.

The objectives are:

- Improved sector policy analysis and knoweldge
- Enhanced mutual understanding and cooperational links and dialogue
- Enhanced regulatory function and improved technical and institutional capacity of the Indian administration
- Enhanced dialogue, information exchange and awareness among civil society's organisations

The areas covered by the project are waste, chemicals, water, air, and climate change.

Project activities to develop the policy dialogue between India and the EU include advisory services, workshops, seminars, training, studies, and capacity building.

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