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ADOPTION, COMPLIANCE, ENFORCEMENT
for ENERGY EFFICIENCY in BUILDINGS

Newsletter

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ECBC India

ECBC 2017 (Energy Conservation Building Code) was launched by Hon'ble Minister (IC) for Coal, Mines, NRE and Power on 19th June, 2017 at Delhi and is applicable for large commercial buildings with connected load of 100 kW and above or 120 kVA and above. ECBC focuses on building envelope, mechanical systems and equipment including heating, ventilating, and air conditioning (HVAC) system, interior and exterior lighting systems, electrical system and renewable energy, and also takes into account the five climates zones (Hot Dry, Warm Humid, Temperate, Composite and Cold) present in India.

The ECBC was developed by an Expert Committee, set up by India's Bureau of Energy Efficiency, with support and guidance from United

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EU-INDIA
CLEAN ENERGY & CLIMATE PARTNERSHIP

Position Paper 7 - Role of research, development and demonstration (RD&D) programmes

An important contribution to decisions on particular EPBD implementation options, and to capacity and confidence building in almost all EU countries, has been through the **funding and delivery of R&D and demonstration (RD&D) projects**. These have covered the following types of products and services:

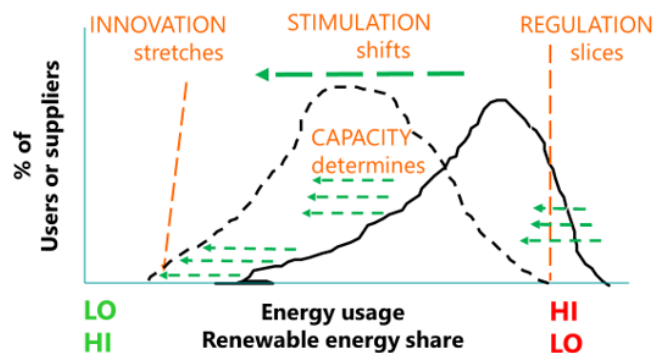
- **Building materials** – such as insulation, concrete products, brick products, windows, doors, vapour barriers, air tightness barriers, jointing details to avoid cold bridging (e.g. at window sills and lintels).
- **Equipment** – boilers, pumps, heat emitters, fans, heating controls (sensors, valves, actuators), air conditioning units, cogeneration systems, lighting products (lamps, luminaires, controls), heat pumps, solar thermal systems, solar photovoltaic systems, heat meters, smart meters, Building energy management systems (BEMS).
- **Services** – design and certification of advisory services, software providers, ‘one stop shop’ energy efficiency renovation packages, ESCOs and energy performance contracting (EPC).

As traditionally understood, RD&D might be perceived to focus solely on the **Innovation** end of the performance spectrum shown in the Figure below. This would be true of traditional product development. However, in reality, a wider spectrum of RD&D activities of various kind has contributed to informing public policy and to helping to build **Capacity** (tools, skills, technical and administrative systems), to provide evidence to inform the implementation of the EPBD in respect of strengthened building energy codes and **Regulations**, and likewise informing market **Stimulation** actions such as energy performance certification systems and promotional programmes.

Elements

- **From idea to market: The RD&D process**
 - The journey to market
 - ‘Technology Readiness Levels’ (TRL)
 - Technology and Market Diffusion
- **Research, Development & Demonstration (RD&D) Programmes and Projects**
 - EU Member State programmes
 - Pan-European programmes
- **RD&D Categories, forms and participation**
 - Categories of RD&D
 - Drivers and priorities of RD&D
 - Participants in RD&D
 - Research networks
 - Product research and development
 - Demonstration projects

The four drivers of market transformation towards energy efficient buildings



At both Member State and EU level, key drivers and priorities for upscaled RD&D activities in Europe have been five-fold:

1. Firstly, the EPBD itself, insofar as Member State authorities have needed information, insights and tools to enable them to adopt efficient and effective approaches to ensuring implementation of the Directive.
2. Secondly, also the EPBD itself, particularly with regard to the target requirement for mandatory ‘nearly zero

energy buildings' (NZEB) within building energy codes and the priority of mobilising and accelerating investment in energy efficient renovation of the existing building stock.

3. Thirdly, by extension of the EPBD to include accompanying EU Directives on EcoDesign and Energy Labelling, the outcomes of RD&D activity in relation to improved building products and energy using equipment help to stimulate manufacturers to create products to higher performance standards.
4. Fourthly, the generic driver of gaining and maintaining competitiveness for EU industry and services sectors, based on showing leadership and innovation in the 'clean' energy and environmental arena. Energy efficiency technologies and practices are seen as one of the most promising areas of enterprise and jobs opportunity. Maintaining a pipeline of superior energy related products and systems is seen as a strategically important element of 'greentech' innovation.
5. Related to the fourth driver, the specific opportunity afforded by the integration of advances in both sustainable energy technologies and methods with fast moving advances in information and communications technologies is seen as an arena of enormous potential, and hence a very fertile field of current research by ICT global leaders in partnership with traditional construction industry players and local authorities. This has led in most Member States an overarching concept across Europe of 'smart cities', extending beyond energy supply and use in buildings to water, waste, public lighting, transport and real time citizen information, engagement and empowerment.

CONCLUSIONS

Support funding for RD&D has been a core feature of EU policy since the 1970s, and within its 'framework' programmes for research, sustainable energy – comprising energy efficiency and renewable energy – has been a significant priority theme. Over the past 10 years of these programmes, funding for energy efficiency and renewable energy has almost tripled, and has included close linkages to research activities supporting energy and environmental policies and to developments in information and communication technologies (ICTs).

- Other capacity building activities
- Concerted Action
- ***Dissemination and promotion***

In informing and assisting implementation of the EPBD across EU Member States, **RD&D activity is an important contributor to capacity building**. A number of different types of research and associated activities have been supported, including the following:

- 'Public good' research (without direct commercial benefit) providing insights and intelligence on the characteristics of the building stock. This is often delivered by 'think tank' institutes.
- 'Public good' research exploring policy options, tackling barriers and needs in delivering low energy buildings, including developments in software and other tools, regional networks of complementary partners, initiatives in skills development and with financial instruments.
- 'Public good' research initiatives such as funding of research fellowships and mobility within and outside the EU, aimed at strengthening EU research capacity (looking to more long term benefits).
- 'Shared cost' research and development (R&D) into new product and service ideas (often incorporating ICT features) aimed at achieving lower energy, lower carbon buildings. This can extend from developments by SME companies or campus companies up to major

integrated projects with multiple partners across several EU Member States (and beyond).

- ‘Shared cost’ demonstration projects highlighting the features, practicalities and benefits of low energy buildings deploying relatively mature design, technology and management solutions, providing visible evidence and building confidence among the developer community.
- ‘Public good’ support for national authorities in shared learning and development of pathways to administratively and economically effective ways of implementing the practical requirements of the EPBD – notably through the EPBD ‘Concerted Action’.

RD&D thus extends beyond traditional boundaries of R&D aimed at product development. Key drivers for these activities in Europe have been the EPBD and related policies mandating ‘nearly zero energy buildings’ (NZEB) within building energy codes and the priority of mobilising and accelerating investment in energy efficient renovation of the existing building stock.

All EU Member States also have RD&D programmes aimed at stimulating the development of new and improved solutions in the built environment. Hence this can be complementary to EU programmes and it is possible for R&D projects to be co-funded by both national and EU funds (subject to ‘State Aids’ limits under EU competition law).

Consistent with its encouragement of more integrated and collaborative initiatives between industry players across Europe in the interests of strengthening competitiveness, the EU encourages the activities of industry associated and their pan-European research networks. A notable example of such a network for the construction sector is the E2B network.

Overall, RD&D activities to drive continuous improvements in the policies, technologies, tools, skills and systems for achieving energy efficient buildings are thus an important ingredient in the EU mission to transform its construction market towards a low energy, low carbon society.

Several of the initiatives may be applicable to India’s circumstances in helping to drive innovation, capacity building and market stimulation towards full and widespread implementation of its Energy Conservation Building Code (ECBC).

Project Partners:



EXERGIA Energy & Environment Consultants



PricewaterhouseCoopers Private Limited India



Center for Environmental Planning and Technology University (CEPT)

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(Cont’d from page 1) States Agency for International Development (USAID) and significant inputs from various other stakeholders such as practicing architects, consultants, educational institutions and other government organizations. The successful implementation of the code requires development of compliance procedures (compliance forms and development of field-test compliance forms and procedures), in addition to building capacity of architects/designers/builders/contractors and government official in States and Urban and Local Bodies (ULBs). It is also dependent on availability of materials and equipment that meet or exceed performance specifications specified in ECBC. The ECBC provides design norms for:

- **Building envelope, including thermal performance requirements for walls, roofs, and windows;**
- **Lighting system, including daylighting, and lamps and luminaire performance requirements;**
- **HVAC system, including energy performance of chillers and air distribution systems;**
- **Electrical system; and**
- **Water heating and pumping systems, including requirements for solar hot-water systems.**