

Energy Efficiency in Buildings: Framework Guidelines

The workshop was held on 12 June and was attended by over 70 participants. It focused on the need to improve drastically energy efficiency in buildings and the role that standards can play in achieving this. Buildings are central to meeting the sustainability challenge. Buildings are responsible for 40% of CO₂ emissions through the energy services they and the activities within them require. By 2050 developing countries will need to accommodate 2.4 billion new urban residents, whereas in the developed world 75-90% of buildings standing today are expected to remain in use. Renewable energy alone cannot meet those requirements, despite recent improvements.

The session was moderated by Scott Foster, Director, UNECE Sustainable Energy Division, who described the context for the framework guidelines. The energy performance of buildings must be managed. The capability to meet this challenge exists. At costs equal or close to those of traditional buildings, it is possible with today's technology to transform buildings to align with the highest standards of health, comfort, well-being and sustainability, including improving energy productivity and reducing CO₂ emissions. The energy required by buildings can be reduced to a level that can be supplied largely, perhaps exclusively, by non-carbon-based energy.

Ksenia Petrichenko, Researcher, Copenhagen Centre on Energy Efficiency, described numerous projects that have demonstrated the ability to design, build and operate high performance buildings in dozens of countries throughout the world. Analysis of these projects, which range from individual buildings to neighbourhoods to cities, indicate a common set of eight action steps that can accelerate the transition to this new paradigm. These include: 1) implementing building efficiency codes and standards; 2) efficiency improvement targets; 3) performance information and certifications; 4) incentives and finance; 5) government leadership by example; 6) engaging building owners, managers and occupants; 7) engaging technical and financial service providers, and 8) working with utilities. The first among these action steps is codes and standards, which have been repeatedly proven to be an effective instrument for addressing energy efficiency in buildings. When properly designed and enforced, building standards provide a structure that motivates the key actors responsible for building construction and operation to change from traditional modes of practice to a new plateau of quality and performance. The concepts set forth in the UNECE Framework Principles for Energy Efficiency Standards in Buildings go well beyond the incremental, components approach of existing building standards. Rather, they represent a principles-based performance guidance for building energy standards that is outcome-based, anchored in energy actually consumed, and designed to project a vision of holistically designed and operated, ultra-high performance buildings as part of an integrated sustainable energy system.

As described by Tom Richard, Penn State University, throughout the world there is a great diversity of building design, function, patterns of use, materials, and climate. To address this diversity effectively, the framework will need to be implemented in different ways for different locations. Thus a first stage in localizing standards is to work with policymakers, architects and engineers, the construction trades and project developers to develop consensus on what local implementation means. Where local examples do not yet exist, regional demonstration projects can serve as case study examples, training sites, and platforms for education of the entire sector. Regional Centers of Excellence can host and leverage these demonstrations for practical training and learning-by-doing for a broad spectrum of business, government and building owners. These Centers of Excellence will be supported and connected by a global consortium of leading universities with expertise in building science as well as the finance and management. The universities and centers will develop educational programmes for multiple audiences, with both on-line and hands-on training and experiences to transform traditional business practices in the building sector, certify current professionals, and develop the next generation of building professionals.

Vitaly Bekker, Project Manager, UNDP Russian Federation, provided specific examples of efficient buildings from the Russian Federation, and added a number of cases of retrofits as examples of the challenges. Ivonne Higuero, Director, UNECE Forests, Land and Housing Division, described in detail a joint task force examining the range of energy efficiency standards in the UNECE region and developing a network of energy efficiency experts.

The key message from the workshop is that improving energy efficiency in buildings can make a substantial near-term contribution to both climate change and quality of life. Wide deployment of the Framework Guidelines for Energy Efficiency Standards in Buildings is an important step. Immediate actions include dissemination of the guidelines, education and training, and research and consultation, while engaging all relevant networks and stakeholders.