Special Event, IEA 9th Annual Global Conference on Energy Efficiency

Renovating Buildings to Raise Energy Performance: Cases from around the World

Nairobi, Kenya
13:00-14:30, 22 May 2024

In 2024, the Hub again brought together officials and experts for a special event to share experience at the IEA's Annual Global Conference on Energy Efficiency. After opening remarks from conference co-host Kenya, Hub Vice Chair China and the IEA, speakers from Brazil, Canada, China, India and Kenya presented and discussed case studies of building energy renovation policies and programmes on the main stage.

The countries face diverse circumstances but found similarities in their policy challenges, including fostering demand for improved energy performance, coordinating among multiple levels of government and different stakeholders, and ensuring fair and affordable access to programme benefits. Speakers described solutions they found effective, from engagement in regulatory processes, to information programmes, to targeted and evolving incentives. Speakers asked each other questions about how to mobilise private capital to complement public policies and how to better disseminate lessons among neighbouring countries and other topics, demonstrating keen interest in learning from one another.

The following summarises speakers' remarks and provides references to the programmes discussed in the session, which was moderated by the Hub's Head of Secretariat, Jonathan SINTON.

Opening remarks: Mr Isaac KIVA, Secretary for Renewable Energy, Ministry of Energy, Kenya

- **Energy efficiency is key to Kenya's growing residential buildings sector.** Africa expects immense expansion of building construction, with residential buildings area projected to double by 2050 to almost 50 billion m^2. Buildings accounted for 74% of total final energy consumption in 2020. Floor area in Kenya is expected to grow from 7 million m^2 in 2018 to 47 million m^2 by 2025, bringing opportunities for improved sector efficiency and access to electricity.
- **Regulatory mechanisms include national building codes and energy management requirements.** The Kenyan National Building Code of 2022 address cooling, ventilation in building design, while incorporating the use of renewable energy sources in accord with the Kenyan Energy Act 2019. Kenya adopted energy management regulations in 2012 and legislation requiring building energy audits is being prepared. Buildings are required to designate energy managers to conduct audits every four years and integrate an energy management plan on reporting.
- **Many challenges remain in improving energy efficiency in buildings**. These include the high cost of appliances for households, which hinders shifting to more-efficient models, weak enforcement of buildings standards, the lack of an energy-use index and green certification, and limited access to technologies.

Keynote presentation: Mr SONG Changqing, Deputy Director-General, National Development & Reform Commission, China and Vice Chair, Energy Efficiency Hub

- **Energy conservation is an important measure to achieving carbon neutrality and sustainable development of society.** China has made progress in energy conservation, renovating more than 300 billion m^2 from 2021 to 2023. China has also seen a 3% decrease of energy consumption per unit area of public institutions. However, total energy consumption and carbon emissions coming from buildings remain high, leaving significant potential for energy conservation and carbon reduction.
- **China recently released an action plan to accelerate energy conservation, reduce carbon emissions, and improve energy efficiency in the building sector.** The action plan includes twelve key tasks that prioritise energy-saving renovations of existing buildings, with an aim to retrofit 200 million m^2 from 2024 to 2025.

Scene-setting remarks: Ms Melanie SLADE, Senior Programme Manager, International Energy Agency

- **Much action is needed by all countries to meet the Global Pledge to double the average annual rate of energy efficiency improvements in existing buildings.** Challenges vary for both existing and new buildings, and the buildings sector is complicated due to multiple stakeholders, including designers, planners, builders, and end users, among others. Sharing experience among regions is crucial.
- **The IEA Policy Toolkit focuses on how the global doubling goal can be achieved.** The Toolkit provides 12 concrete policy tools that address the efficiency of buildings, appliances, industry, and vehicles. The Policy Toolkit highlights that the greatest efficiency gains are achieved by a package of policies that combine three main types of tools: regulation, information, and incentives. The Australian NABERS system for regulating, measuring, and disclosing performance of existing buildings demonstrates how these three types of policy tools can complement each other. The system is government-led, but it effectively drives private sector engagement by providing incentives for building service providers.

Building Renovation Case Studies

Brazil: Ms Agnes DA COSTA, Director, Brazilian Electricity Regulatory Agency (ANEEL)

- In Brazil, utility companies are legally required to devote a portion of net revenue to improving energy efficiency. Currently, utilities apply this to policy initiatives implemented by the Ministry; others apply funds to projects regulated by the Brazilian Electricity Regulatory Agency (ANEEL).
- ANEEL has invested in energy efficiency for public and non-profit hospitals to reduce energy use. In 2022-2025, 120 hospitals were selected for inclusion through a call for proposal. Funds totalling EUR 23 million paid for equipment replacements (lights, oxygen, air conditioning), training and capacity building for staff on efficient equipment (operations and maintenance), and investments in distributed PV and other renewable generation. Results include energy savings of 38 000 MWh/yr, comparable to a Brazilian city of 25 000 inhabitants.

Canada: Dr Dean HASLIP, Director General, Natural Resources Canada

- Canada presented its holistic approach to retrofits and its focus on collaboration with sub-national governments, job creation and representation, and support for low-income households.
- The Canada Greener Homes Grant (CGHG) of 2021 provides grants of CAD 5 000 (Canadian dollars) for energy efficiency improvements. As of May 2024, the initiative has helped 212 000 Canadians to retrofit their homes and supported 75 000 jobs in the retrofit sector.
- Natural Resources Canada introduced the Oil to Heat Pump Affordability Program of 2023 to provide upfront payments for low to middle income households to replace oil furnaces with electric heat pumps. The programme now incentivises adoption of heat pumps and reduces barriers to eligibility while fostering collaboration with sub-national governments as co-delivery partners to include the participation of indigenous households. The Sustainable Jobs Plan

(20230-25) aims to create sustainable local jobs, support social equity and inclusion, and align with international efforts to promote a just transition.

- Canada's Deep Retrofit Accelerator Initiative (DRAI) targets large commercial, institutional, mid- and high-rise residential buildings through retrofit accelerators, which facilitate retrofits for building owners by coordinating across service and equipment providers. The programme provides a total of CAD 185 million over 3 years to support retrofit accelerators and building owners through the deep retrofit process, driving market transformation
- Canada is developing new model building codes on efficiency alterations to existing buildings, set for release in 2025. Energy performance benchmarking tools, such as the ENERGY STAR Portfolio Manager, help building owners identify retrofit options and estimate results.
- To facilitate a just transition and ensure benefits for low-income households, the Canada Green Building Strategy, to be released June 2024, aims to lower home energy bills and building-related GHG emissions through energy efficiency retrofits, better building codes, and home energy labels. It will include a new Canada Greener Homes affordability program for low-income households.

China: *Mr YU Shanchuan, Division Director, Ministry of Housing and Urban and Rural Development*

- The Ministry of Housing and Urban Development (MOHURD) promotes and implements energy-saving retrofits of existing buildings in key cities. National policies for carbon peaking and carbon neutrality in urban and rural construction aim to promote energy efficiency improvement.
- Living environments were significantly improved by energy-saving retrofits, resulting in a reduction of indoor temperatures by 2-3°C during summer and an increase of indoor temperatures by 3-5°C during winter. Additional initiatives include addressing energy efficiency in existing residential and public buildings, improvements to the standards system, upgrading the level of retrofits, and demonstration projects to improve the retrofit model.
- MOHURD promoted the implementation of energy-saving and thermal insulation projects in the city of Qingdao, which has issued local policies and standards, established a market approach to "retrofit first, reward later", piloted a model of "government-led and market-operated", and built an efficient approach to implementation. This has attracted investment from enterprises and increased the scale of retrofits, easing pressure on public funds.
- MOHURD also deployed the energy-saving and green retrofit model in the city of Chongqing. Chongqing adopted an "energy-saving, benefit-sharing" model to guide green retrofits of existing public buildings. The model used a cooperative approach, involving construction management departments, project owners, energy-saving service companies, third-party certified institutions, and financial institutions to improve the five stages of project development.
- China is focusing on equipment renewal and has plans to develop more policies for thermal insultation of external walls, retrofits for doors and windows, heating equipment, etc.

Germany: *Ms Caterina SALB, Policy Officer, Federal Ministry for Economic Affairs and Climate Action*

- The German Buildings Energy Act provides the regulatory framework for the transition to clean energy through renewable heat and efficiency standards for new and existing buildings.
- The German Federal Funding for Efficient Buildings (BEG) programme provides funding for systemic renovations for both residential and non-residential buildings. The programme also provides funding for individual renovation measures. The programme can be accessed by all types of carriers of investments including private citizens, associations, and companies alike.
- The German Ministry for Economic Affairs and the German Federal Ministry for Housing, Urban Development and Building put the Heat Planning Act into force in January 2024. It includes an obligation for governments at the local and community level to analyse heating potential and draw up heat plans. Cities larger than 100 000 inhabitants must draft a heat plan within the next 2 years, while smaller cities must do so within 4 years. Within 2 to 4 years, homeowners will be able to determine whether they can access an efficient heating system within 10 years, allowing

for a transition period. The Act also includes an obligation to decarbonise district heating with the goal of becoming climate neutral by 2045.

India: *Ms Reena SURI, Executive Director, India Smart Grid Forum*

- A project developed by the India Smart Grid Forum enhanced grid interactivity at a university campus by implementing retrofit measures such as energy efficient heating, ventilating systems, LED lighting, air conditioning, and advanced building auto systems. It aimed to establish an ecosystem of public-private partnerships and engage energy service companies to enhance the affordability of building retrofitting projects.
- As of 2023, the campus had retrofitted over 25 million ft^2 of building space, integrated use of renewable energy, and installed 60 MW of solar capacity. The project deployed energy management systems to integrate into the grid and provide support to grid at peak times. Energy storage systems provided 20 MW battery storage accessible to the grid.
- Challenges included the integration of many different aspects, the management of and intermittent nature of renewable energy, and the optimisation of load management without disrupting operations.
- Benefits included an approximate 30% reduction of annual energy consumption, improved grid stability, and a decrease of 80 000 metric tonnes of CO_2 annually.

Kenya: *Mr David MUTISYA, Director of Renewable Energy, Ministry of Energy and Petroleum*

- The Kenyan Ministry of Energy introduced a pilot lighting project for boarding schools after implementing its first National Energy Efficiency and Conservation Strategy in 2020. Together with the Ministry of Environment and the Ministry of Education, the approach brought together multiple stakeholders in the buildings sector to implement energy efficiency measures in 100 secondary boarding schools. Support for the pilot was provided by a number of stakeholders, including UNEP-CCC, the Signify Foundation, and Sustainable Energy for All. Estimated savings are 885 MWh of power, KES 28 million (Kenyan Shillings) of energy costs, and 400 metric tonnes of CO_2 emissions.
- The objectives were to 1) build a business case testing a holistic approach to solving energy efficiency issues; 2) create awareness of energy conservation; 3) reduce electricity bills; and 4) create a baseline for future innovations with an aim to reducing carbon footprint. Measures included audits, installation of LED bulbs or other retrofits, and educational initiatives aimed to foster behaviour change in the energy conservation of public buildings.

For further information about this event and for general questions about the Hub, please write to:
Secretariat@energyefficiencyhub.org.