

Cost-effective Building Renovation at District Level Combining Energy Efficiency and Renewables

EBC ANNEX 75

Buildings are a major source of greenhouse gas emissions and cost-effectively reducing their energy use and associated emissions is particularly challenging for the existing building stock, mainly because of the existence of many architectural and technical hurdles. The transformation of existing buildings into low-emission and low-energy buildings is particularly challenging in cities, where many buildings continue to rely too much on heat supply by fossil fuels. However, at the same time, there are specific opportunities to develop and take advantage of district-level solutions at urban scale. In this context,



An energy-renovated neighbourhood at Vesterbro in Copenhagen.
Source: Cenergia

PROJECT OBJECTIVES

- 1 investigating cost-effective strategies for reducing greenhouse gas emissions and energy use in buildings in cities at district level, combining both energy efficiency measures and renewable energy measures
- 2 providing guidance to policy makers, companies working in the field of the energy transition, as well as to building owners, on how to cost-effectively transforming existing urban districts into low-energy and low-emission districts

the project aimed to clarify the cost-effectiveness of various approaches that combined both energy efficiency measures and renewable energy measures at the district level. At this level, finding the balance between renewable energy measures and energy efficiency measures for the existing building stock is a complex task and many research questions still need to be answered.

ACHIEVEMENTS

This project achieved the following:

- a report on technology overview, identifying energy efficiency measures and renewable energy measures at district level in an urban context;
- a methodology report on cost-effective building renovation at district level;
- supporting tools for decision makers: identification and adaptation of tools to support the application of the methodology in generic and case-specific assessments;
- a report on case studies, showing cost-effective

INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA) was established as an autonomous body within the Organisation for Economic Co-operation and Development (OECD) in 1974, with the purpose of strengthening co-operation in the vital area of energy policy. As one element of this programme, member countries take part in various energy research, development and demonstration activities. The Energy in Buildings and Communities Programme has co-ordinated various research projects associated with energy prediction, monitoring and energy efficiency measures in both new and existing buildings. The results have provided much valuable information about the state of the art of building analysis and have led to further IEA co-ordinated research.

EBC VISION

By 2030, near-zero primary energy use and carbon dioxide emissions solutions have been adopted in new buildings and communities, and a wide range of reliable technical solutions have been made available for the existing building stock.

EBC MISSION

To accelerate the transformation of the built environment towards more energy efficient and sustainable buildings and communities, by the development and dissemination of knowledge and technologies through international collaborative research and innovation.

combinations of energy efficiency measures and renewable energy measures in building renovation at district level;

- a report on good practice examples, showing strategies on transforming existing urban districts into low-energy and low-emission districts;
- guidebooks containing guidelines for policy makers and energy-related companies on how to encourage the market uptake of cost-effective strategies combining energy efficiency measures and renewable energy measures and guidelines for building owners and investors about cost-effective renovation strategies, including district-based solutions;
- recommendations for subsidy programmes and for encouraging market uptake through competitions.

The following reports were published as the official project deliverables:

- Technology Overview
- Optimization Methodology and Strategy Development
- Case Studies
- Policy Instruments, Stakeholder Dialogue, and Dissemination

Project duration

Completed (2016 - 2023)

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Further information

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