IEA EBC Annex 75

Cost-Effective Building Renovation at District Level Combining Energy Efficiency & Renewables

13 countries are involved in the project:
AT, BE, CH, CN, CZ, DK, ES, GE, IT, NL, NO, PT, SE

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Technical Day
24th June, 2020

1. Project Goal

Project Goal: reach cost-effective energy and carbon emission optimization in building renovation at an urban district scale

Key question: Where is the balance point between energy efficiency measures and measures that promote the use of renewable energy?

Annex 56: At the building level

Annex 75: At the level of groups of buildings / urban districts

2. Project Idea

- At district level there are specific opportunities as well as specific challenges when compared to the building level

- Finding the balance between renewable energy supplies and energy efficiency measures for the renovation of the existing stock is more complex at district level than for individual buildings, but may also bring larger benefits

2. Project Idea

There are several options available that need to be explored:
Exemples:

- **We can benefit from significant economies of scale for energy efficiency measures due to aggregated demands and synergies in construction procurement, processes and planning**
  The provision of low-temperature district heating systems to groups of buildings may benefit from synergies when combined with energy efficiency measures applied to the buildings envelopes

- **There is also an opportunity to benefit from centralized renewable energy approaches**
  The availability of heat storage facilities that in a single building intervention is limited to the building floor space, at district level the options are wider

2. Project Idea

However, there are also some challenges:

- **At the level of individual buildings, synergies between energy efficiency measures and installation of renewable energy systems can be easily achieved but, at district level such synergies are not necessarily available as they depend on the existing heating systems and on the synchronization of the buildings´ renovation cycles**

In this context, it is important to explore the potential of cost-effective renovation interventions at district level to accelerate the necessary transition towards low-emissions and low-energy districts

3. Annex 75 Objectives

EBC
Energy in Buildings and Communities Programme

In Annex 75:

- To define a flexible methodology, supported by efficient tools, to identify cost-effective strategies for renovating urban districts to significantly reduce carbon emissions and energy use
- To identify and document good practice examples showing strategies for transforming existing urban districts into low-energy and low-emissions districts
- To prepare 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
- To prepare Guidelines for building owners and investors about cost-effective district-level solutions

http://annex75.iea-ebc.org/

4. Annex 75 Scope and Target Groups

Annex 75 Scope:

- **Residential buildings**
  Single-family houses and multi-family buildings

- **Non residential buildings**
  without complex HVAC systems

Annex 75 Target Groups:

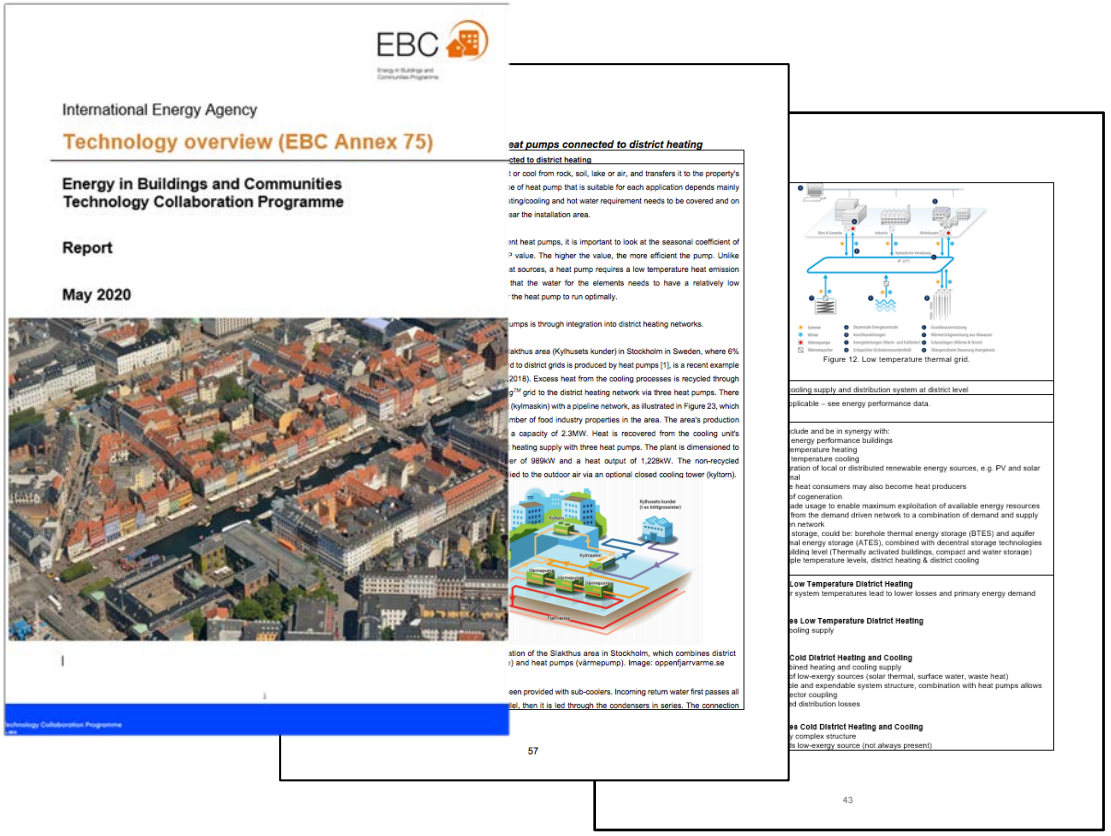
- **Policy makers**
- **Companies working in the field of the energy transition**
- **Building owners**

5. Annex 75 Outputs

- Report on Technology Overview
- Methodology Report on cost-efficient building renovation at district level
- Assessment tools
- Report on the application of the methodology in generic districts
- Report on strategy development
- Report on parametric assessments of case studies
- Online documentation of good practice examples
- Report on enabling factors and obstacles to replicate successful case studies
- Good practice guidance: Guidance for transforming existing districts into low-energy and low-emission districts
- Report on policy instruments, including recommendations for subsidy programmes and for encouraging market take-up
- Report on business models and models for stakeholder dialogue
- Guidelines for policy makers and energy related companies on how to encourage the market take-up of cost-effective strategies combining energy efficiency measures and renewable energy measures
- Guidelines for building owners/investors about cost-effective renovation strategies, including district-based solutions

6. Outputs

Technology Overview Report



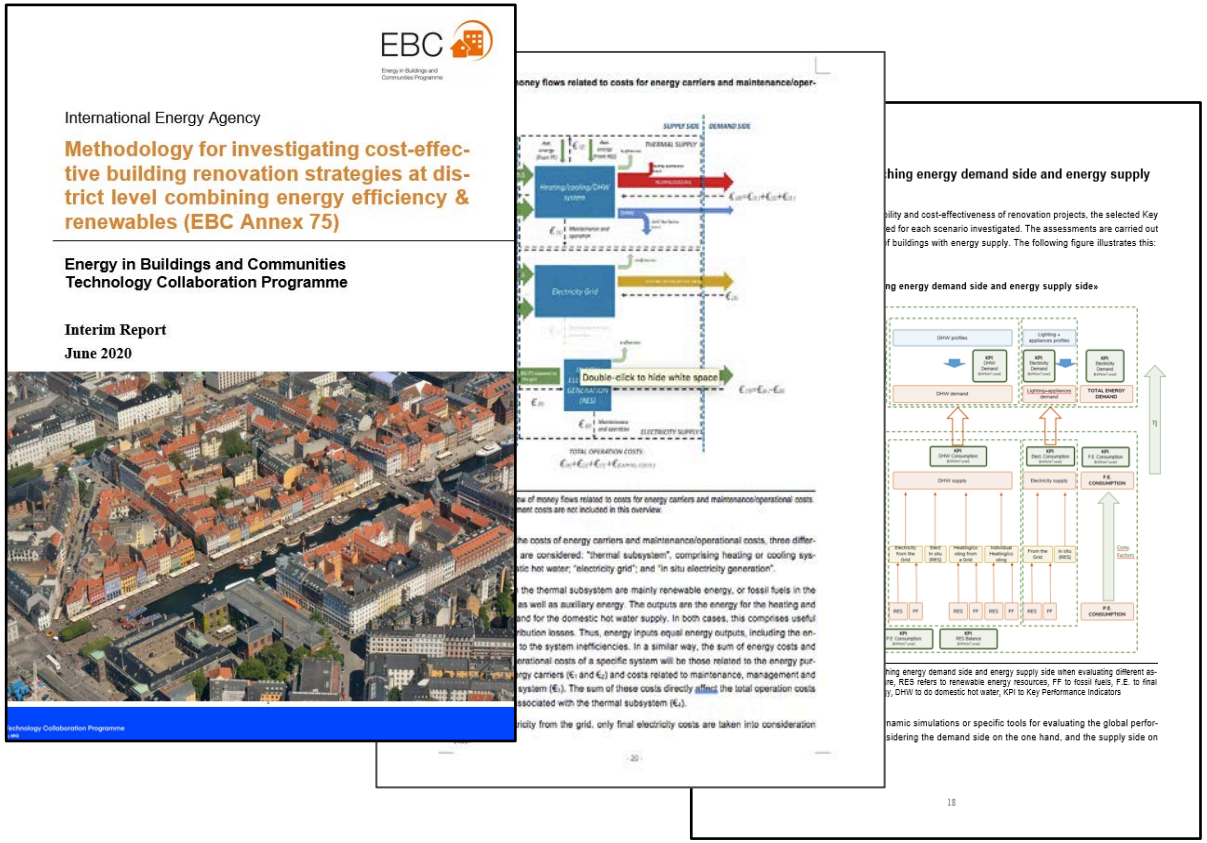
The report presents an overview of the **available technologies** for **energy renovation** and **renewable energy supply** at the district level, showing:

- **Technical and economic characteristics** of the technology options, taking into account **economies of scale.**
- **Interdependencies, obstacles and success factors** for combining the technology options.
- **Available potentials**, and expected **future developments.**

https://annex75.iea-ebc.org/publications

6. Outputs

Methodology Report



The report describes the **methodology for identification and assessment of cost-effective strategies** for renovating urban districts:

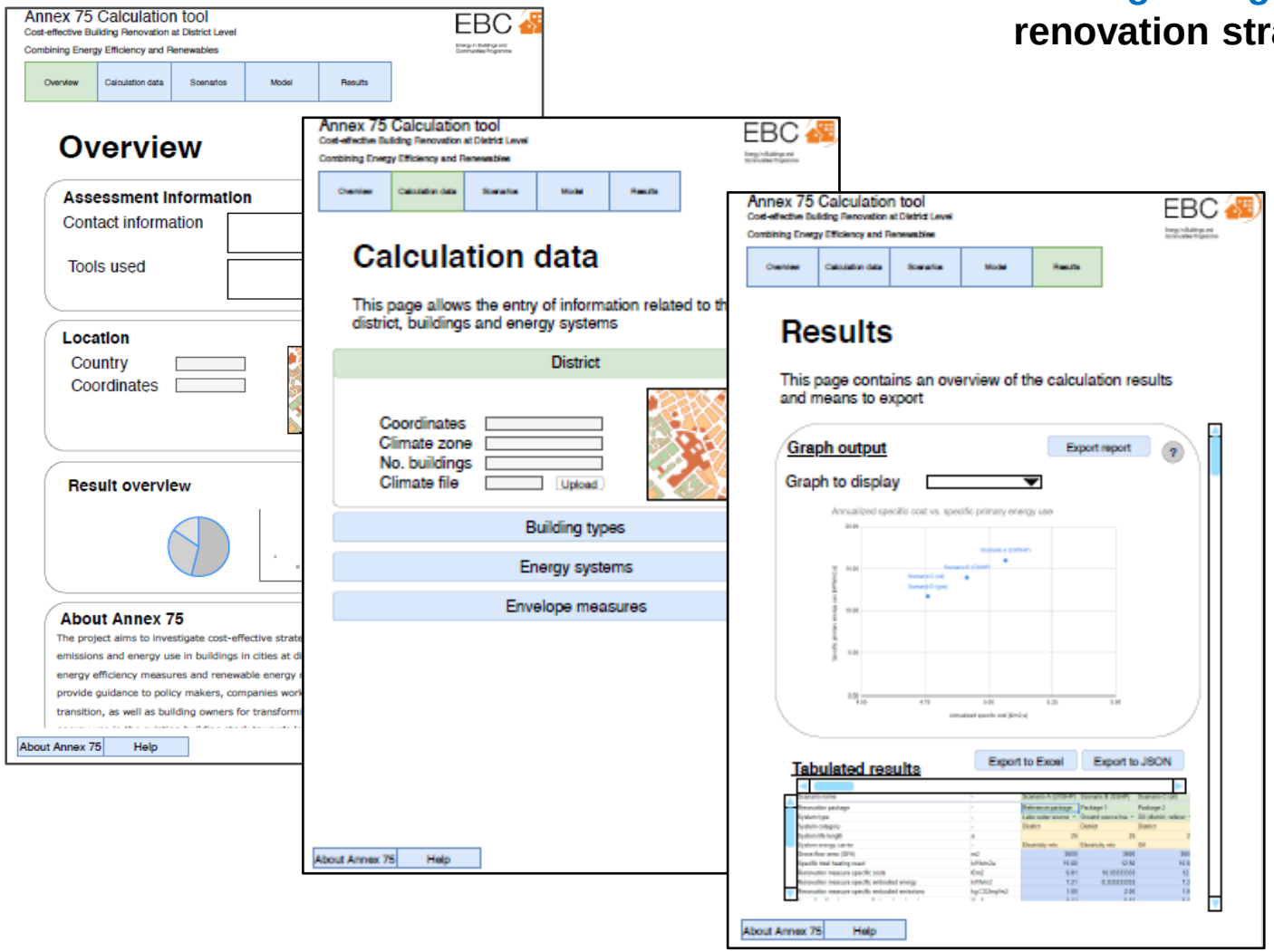
- Defines the **boundary conditions** for the assessments
- Presents the main **research questions** to be investigated
- Defines the **outputs** to be generated in the analyses

This document intends to **support decision makers** in the evaluation of the **efficiency, impacts, cost-effectiveness and acceptance** of various strategies for **renovating urban districts**

6. Outputs

Annex 75 District Calculation Tool

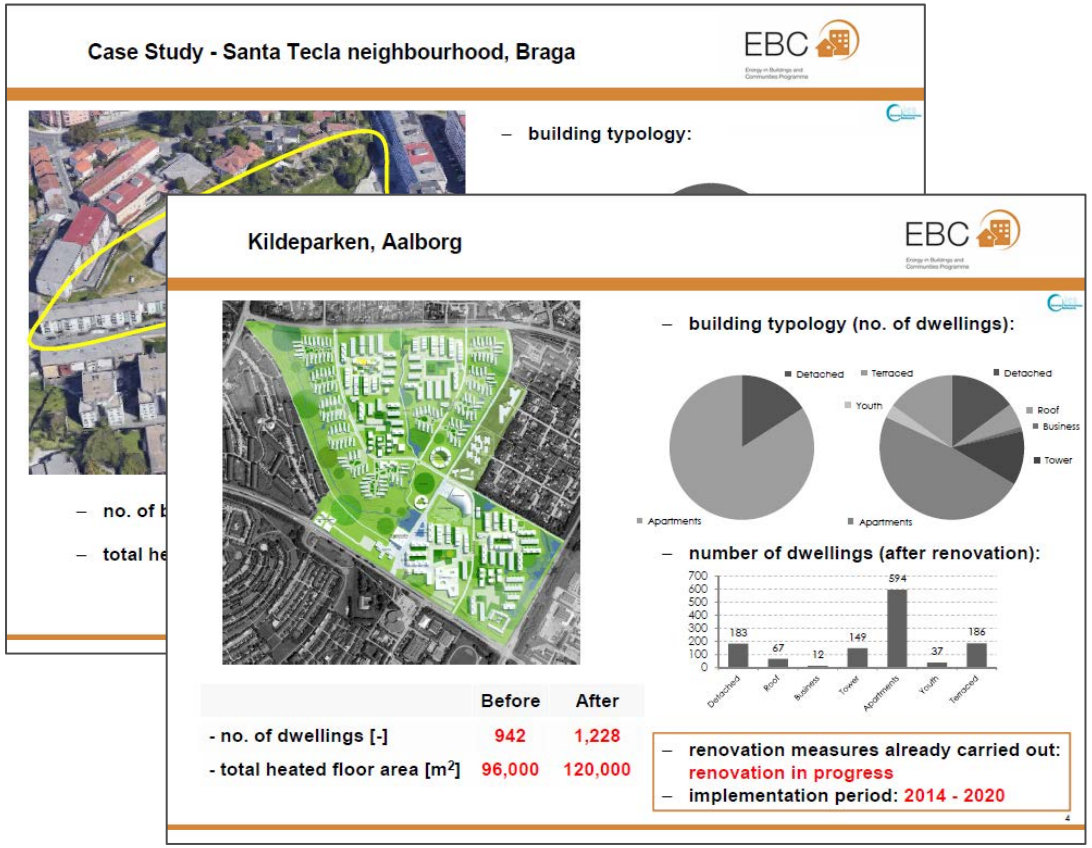
Online calculation tool for district heating sizing and cost-effectiveness of renovation strategies



- characteristics of the district
- characteristics of the buildings
- renovation scenarios
- cost curves
- …

6. Outputs

Identification of Success Stories and Case Studies



Success Stories – already finished district-based renovation **projects**

where **economic**, **technical** and **social factors** that **enable or hinder** successful renovations were identified

Case Studies – open renovation projects used to **apply and test** the Annex 75 **Methodology**

There is still the possibility to **provide guidance in choosing the most appropriate renovation strategy** especially in finding synergies and trade-offs for combining energy efficiency measures and renewable energy measures

Results obtained and lessons learned are used to prepare a **good practice guidance** for low-energy and low-emission districts

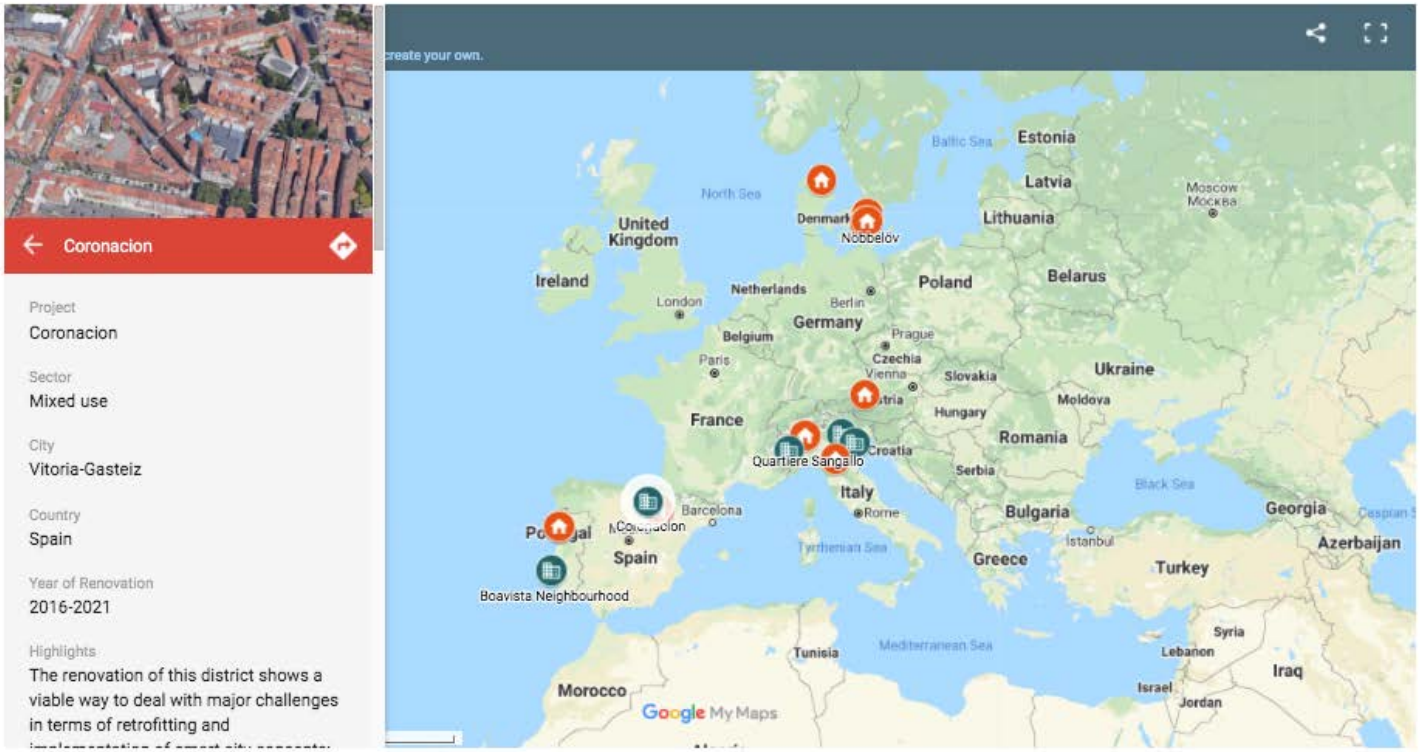
6. Outputs

Success Stories Webpage

HOME ABOUT SUBTASKS SUCCESS STORIES PUBLICATIONS PARTICIPANTS NEWS MEETINGS MEMBER AREA

HOME / SUCCESS STORIES

Success Stories



HOME ABOUT SUBTASKS SUCCESS STORIES PUBLICATIONS PARTICIPANTS NEWS MEETINGS

Interactive map integrated in the Annex 75 website.

https://annex75.iea-ebc.org/success-stories

6. Outputs

Workshops on Policy Instruments, Stakeholder Dialogue and Business models for upscaling District energy renovation

Workshop at Bilbao – March 2019

Workshop at Delft – October 2019

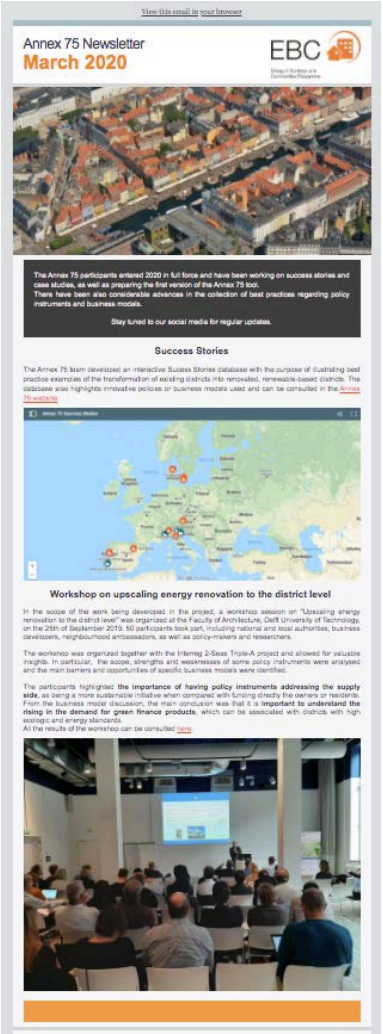
With insights from the workshops and interviews, a report is being prepared:

- To give an overview on various policy instruments and business models at the district level
- To evaluate stakeholder's acceptance of the proposed policy instruments
- To illustrate the development and assessment of innovative local policy instruments in selected cases
- To give recommendations to policymakers and their key partners on how they can influence the uptake of cost-effective low carbon renovation solutions

7. Dissemination

Dissemination

http://annex75.iea-ebc.org/

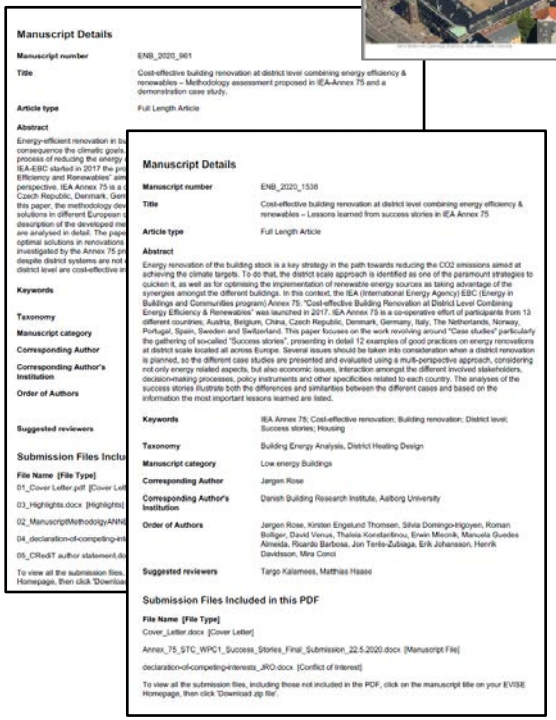


Annex 75 Newsletters

Papers in conferences

Papers on national journals

Papers in international journals



Presentations in events COP25 Madrid

7. Dissemination

http://annex75.iea-ebc.org/

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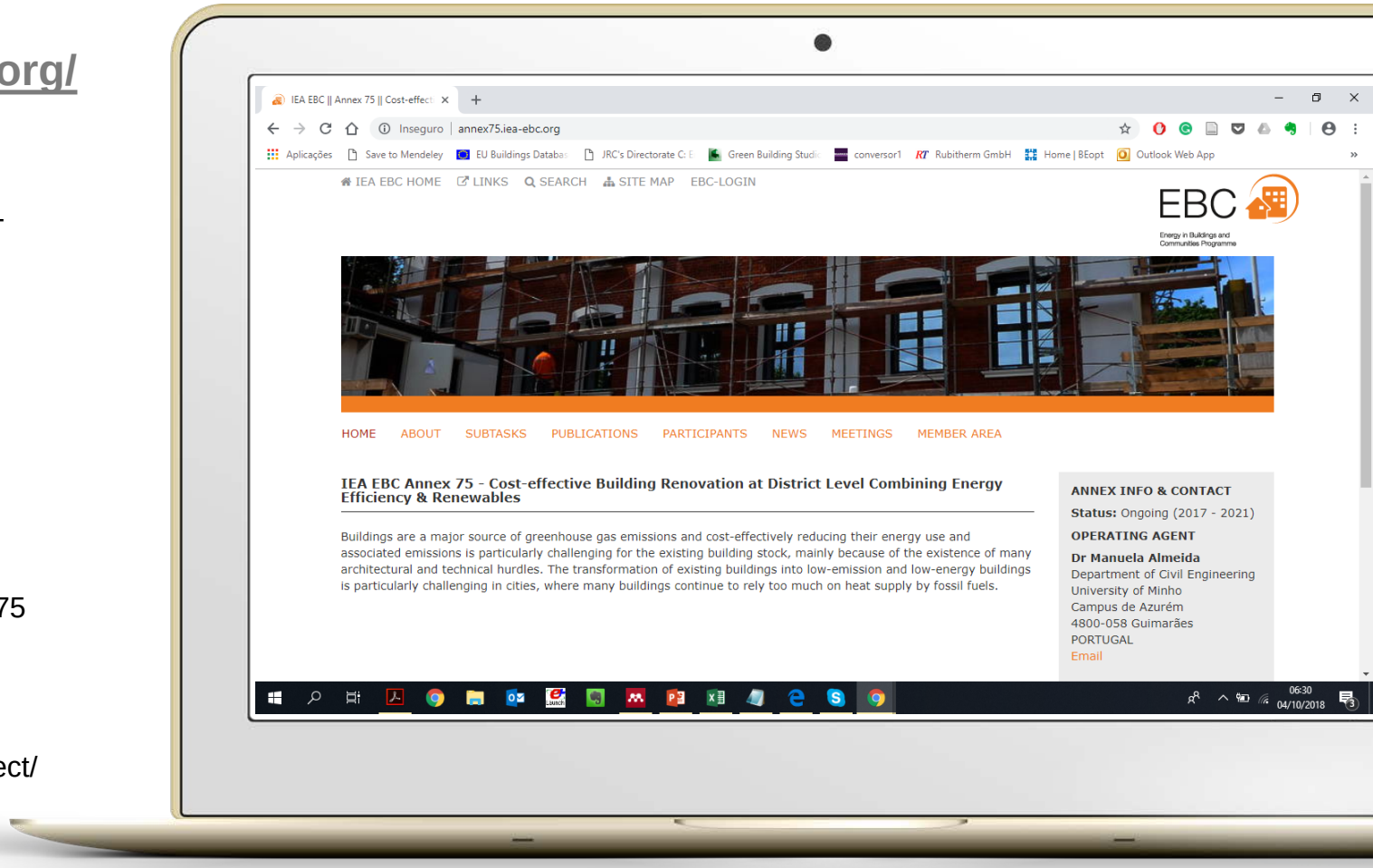
www.researchgate.net/project/IEA-EBC-Annex-75



Thank you for your attention!

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