



DATA-DRIVEN DECISION-SUPPORT TO INCREASE ENERGY
EFFICIENCY THROUGH RENOVATION IN EUROPEAN BUILDING
STOCK

D8.5 – Conference Briefing paper

[WP8 – Communication, Dissemination and Exploitation]



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Imprint

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TUM- Technische Universität München (Germany)
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 KSSENA –Zavod Energetska Agencija Za Savinjsko Salesko in Korosko (Slovenia)
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Abstract

In advance to the final conference of the EERAdata project, this conference brief has been created to be disseminated to all participants and registered stakeholders. The purpose of this document is to provide a concise overview over the project, its goals, intention, methodologies as well as results. It provides a starting point for further discussions and information throughout the conference and its online enhancements. Furthermore, it will be distributed through the website and used as a project information brochure after the conference as well.

Main content of the briefing paper:

- Project intention and partners
- Project goals
- Project outputs and results
- Methodological insights
- The EERAdata Decision Support Tool – short description

This deliverable, however, not only contains the conference brief but also the conference agenda and an overview over the underlying principles of the event.

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1. Conference Introduction

Purpose of conference

The EERAdata project has organised a final conference for at least 70 stakeholder representatives as its final and public dissemination event. The conference will bring together key stakeholders working in the field of energy renovation of buildings to jointly address the challenges and barriers of better understanding and quantifying wider benefits of potential Energy Efficiency investment projects. The EERAdata consortium will present newly developed approaches embodied within an online decision-support tool (DST), with the ambition of facilitating more effective strategic planning in the scope of the vision of the renovation wave. A core element will be the demonstration of the EERAdata Decision Support tool and its main features as well as case study results. This should raise interest among potential secondary implementers in the audience. Test accounts will be made available for interested parties after the conference.

Originally, the conference was meant to take place in a central, well-connected location allowing easy access by invited stakeholders from across Europe. However, due to the COVID-19 situation, the event will take place online, with the project partners that are able to travel, participating from COAMA's headquarters in Malaga, Spain. Partners have invited their contacts to attend the conference and promoted the event on the [project website](#) and on social media to increase its visibility and outreach. A brief has been prepared prior to the conference, acting as a briefing paper that will be included in a delegate pack to be provided to conference participants digitally. The pack will furthermore contain publications, public deliverables as well as tutorial videos for the tool.

See the full agenda in Annex 2.

Conference content

- Hybrid event: project team is present and presentations from the team are streamed online. External participants are presenting online from their location.
- Language: English
- Target audience: key stakeholders working in the field of energy renovation of buildings, researchers, and academics
In presence: 10-15 participants from the EERAdata team
- Online: ca. 70 participants
- Proposed platform for online interaction (<https://www.gather.town/>)
- Interaction between stakeholders and presenters (<https://www.mentimeter.com/>)

Supporting materials

- Feedback tool and blackboard to exchange ideas, etc. online and in person
- Brochures and Info Point
- Signature list for the ones that are interested in testing the tool
- Online Videos and tutorials of the DST as well as video snippets from project partners online

2. EERAdata Project

The EERAdata project has developed and tested a decision-support tool to help local administrations in the collection and processing of their building and demographic data towards an assessment and prioritisation of Energy Efficiency measures in planning, renovating, and constructing buildings.

While EU policy assigns a primary role to Energy Efficiency (EE), the lack of a holistic understanding of the impact of EE investments has hindered its integration in the policy-making process. Coordination between demand and supply side of energy policy is not targeted, and there is a need to gather the evidence on the benefits of EE in ecological and socio-economic terms, as well as on its interactions with the broader policy context and energy market.



- **EERAdata will operationalise the Energy Efficiency first Principle (EEfP) on a municipal and regional level**
- **It assesses the multiple benefits that arise through energy efficiency measures applied on single buildings**
- **It has created a software solution and related database which helps municipalities and regions to perform these assessments**

Project goals

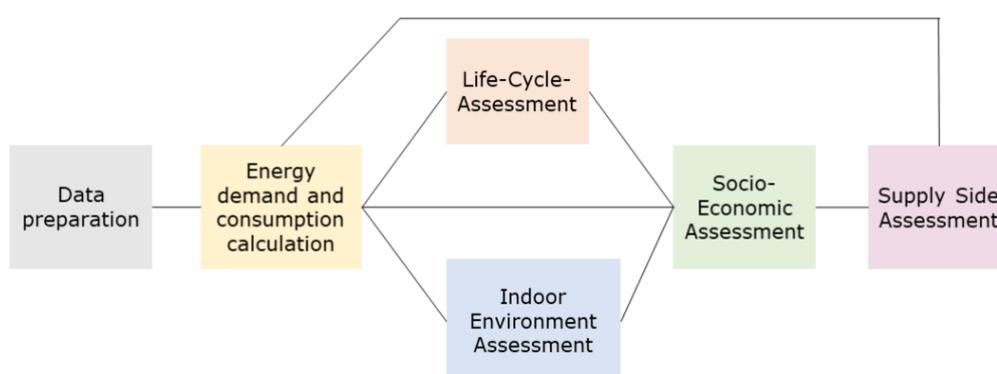
- Broader justification for energy efficiency investments
- Identifying economic and monetary benefits for various stakeholders
- Argument and motivation for more comprehensive energy efficiency measures
- Changing the role of buildings
- Increasing wellbeing and health
- Quantifying the impact of building renovation on societal issues (fuel poverty, environmental pollution, climate change, etc.)

Project Outputs

1. Scientific calculation methodologies to assess EE in the economic, social, and environmental sectors
2. Parameter and indicator list for socio-economic and LCA assessment
3. Data collection guidelines and templates
4. Assessment and Decision-Support Tool (EERAdata DST)
5. Comprehensive database with default and proxy values
6. Implementing Guidelines

Assessment modules:

The EERAdata project and the Decision Support Tool are based on 6 modules with 5 assessment methodologies which are interconnected. The process starts with building and municipal data preparation and integration into the DST databases. Based on this data, the energy demand and consumption of one or multiple buildings is calculated. This feeds into the life cycle assessment and indoor environment assessment modules. The results of all three modules are then monetised and further evaluated in the Socio-economic assessment module. The final element is the supply side assessment which estimates the cost benefits of alternative supply side investments, compared to the previously calculated energy efficiency investments. All calculations can be done for the status quo of the selected building and multiple renovation options which can be combined and compared with each other.



Data management and preparation

The data management comprises three layers of datasets:

- **Building related data** for the specific buildings like geometry, age, technology, materials
- **Municipal data** like location of building, weather, economy, environment, tax system, etc.
- **Global datasets** like statistics, scientific findings, modelling elements, norms, etc.

There are three quality levels of data in the calculation process:

- There is **minimum required data** which represent the minimum data which is needed to run calculations, like building geometry or weather data. This data has to be real, building specific data.
- There is **desired data**, which improve the results of the calculations significantly, like the real building u-values, heating system details, energy sources, materials, etc.
- There is **detailed data** which improve the results but are hard to find and integrate into the database. Mostly this refers to model-related data or details like window opening area or the exact shading factors etc.

Energy Demand and consumption calculation

The energy demand calculation is the first assessment that is applied on the selected building. It is based on a static calculation of energy loads related to the geometry, construction, and energy systems of the building and its surrounding temperatures.

- Specific and total final energy demand for heating and domestic hot water
- Specific and total primary energy demand for heating and domestic hot water
- Total heating load for heating and domestic hot water

Life Cycle Assessment

The life cycle assessment takes into account the building materials and technology. It assesses the global warming potential and primary energy demand over the whole life cycle from construction over operation to end of life. Outputs are:

- Embedded specific and total primary energy demand for renewable and non-renewable sources
- Operational specific and total primary energy demand for renewable and non-renewable sources
- Embedded specific and total global warming potential in kg CO₂ eq.
- Operational specific and total global warming potential in kg CO₂ eq.

Indoor Climate Assessment

The indoor climate assessment is based on empirical data and simulates the indoor climate in the selected building by taking into account parameters like building geometry, weather, window openings, ventilation, terrain factors and many more. It estimates the productivity and health of occupants in schools based on indoor temperature and CO₂ concentration. Outputs are:

- Indoor temperature and CO₂ concentration over the year
- Indoor air quality categories
- Teachers and pupils' performance
- Teachers and pupils' sick days
- Monetised values for performance increase and reduction of sick days

Socio-Economic Assessment

Based on the LCA and Indoor climate assessments, the socio-economic impacts are monetised. Outputs of the other modules are processed into a probability network (Bayesian Network) in which they are combined with socio-economic parameters and local conditions of the assessing municipality. Out of CO₂ emission numbers, the various CO₂ costs are calculated, for example. The outputs are:

- Job creation in FTE/year and reduced unemployment expenditure
- Trade and Income tax revenues as one-time effects for the investment
- Fuel poverty alleviation
- Social, Tax and Emission trading CO₂ costs
- Energy cost
- Particulate matter emissions

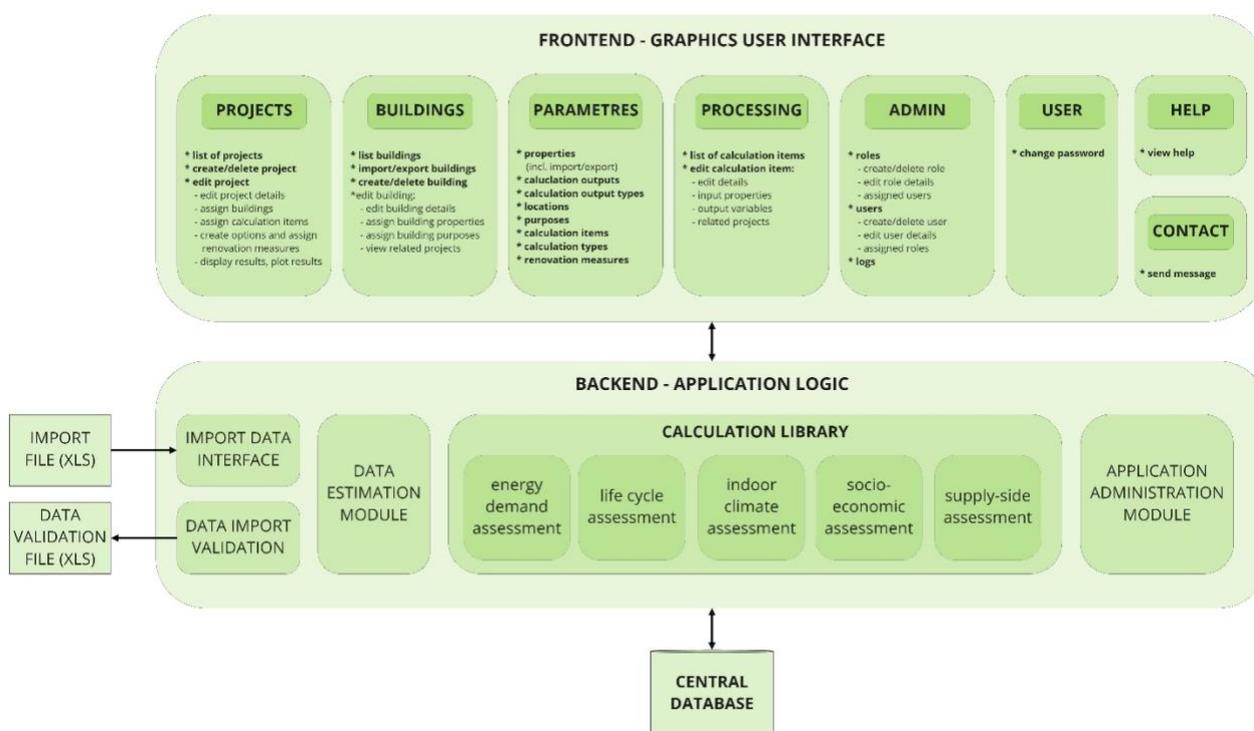
Supply Side Assessment

Supply side assessment was integrated as a counterpart to the other modules. It assesses what would happen when all the investment is made on on-site or decentral renewable energy generation instead of energy efficiency. Some solutions are on-site PV, wind parks, biomass, etc. Outputs are:

- Investment cost for supply side solution
- CO₂ emission reduction
- Energy cost reduction
- Various supply side options

EERAdata Decision Support Tool

The EERAdata Decision Support Tool integrates all 5 assessment methods and the complex data management system into one browser-based software solution. It comprises and imports functions for building data and three user types. The normal user can create projects by combining buildings assigning renovation measures and assessment methods. These projects are then processed, and results are listed. The expert user can import buildings, define parameters, and can change all properties of the tool to adjust it to local conditions. The admin user can create users and assign roles for the further use of the tool.



3. Key Results

The 5 assessment modules calculate outputs for single buildings or several buildings in a batch simulation. These outputs can be sorted by the directness of impact for the planning and investing entity:

1. Without benefits, only energy related savings

- Energy cost reduction

➔ Payback time: baseline

2. With wider socio-economic benefits

- + Reduction of sick days among teachers
- + Increase of teachers' performance
- + Tax returns (income and trade tax)
- + Reduction of CO₂ emission cost (Tax, Emission Trading costs)

➔ Payback time: reduction up to a factor of 5-15

3. With societal socio-economic benefits

- + Increase of pupil performance due to higher learning performance in school
- + Reduction of sick days among pupils in schools
- + Job creation and related reduction of unemployment expenditure
- + Reduction of social CO₂ emission cost

➔ Payback time reduction up to a factor of 15-45

4. To compare Supply Side Assessment

- Energy cost savings

Project contact and DST testing opportunity:

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4. Annexes

Annex 1: Conference Brief in Brochure Form





EERADATA PROJECT

The EERAdata project has developed and tested a decision-support tool to help local administrations in the collection and processing of their building and demographic data towards an assessment and prioritisation of Energy Efficiency measures in planning, renovating, and constructing buildings.



While EU policy assigns a primary role to Energy Efficiency (EE), the lack of a holistic understanding of the impact of EE investments has hindered its integration in the policy-making process. Coordination between demand and supply side of energy policy is not targeted, and there is a need to gather the evidence on the benefits of EE in ecological and socio-economic terms, as well as on its interactions with the broader policy context and energy market.

- EERAdata will operationalise the Energy Efficiency first Principle (EEfP) on a municipal and regional level
- It assesses the multiple benefits that arise through energy efficiency measures applied on single buildings
- It has created a software solution and related database which helps municipalities and regions to perform these assessments



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PROJECT GOALS

- Broader justification for energy efficiency investments
- Identifying economic and monetary benefits for various stakeholders
- Argument and motivation for more comprehensive energy efficiency measures
- Changing the role of buildings
- Increasing wellbeing and health
- Quantifying the impact of building renovation on societal issues (fuel poverty, environmental pollution, climate change, etc.)

PROJECT OUTPUTS

1. Scientific calculation methodologies to assess EE in the economic, social, and environmental sectors
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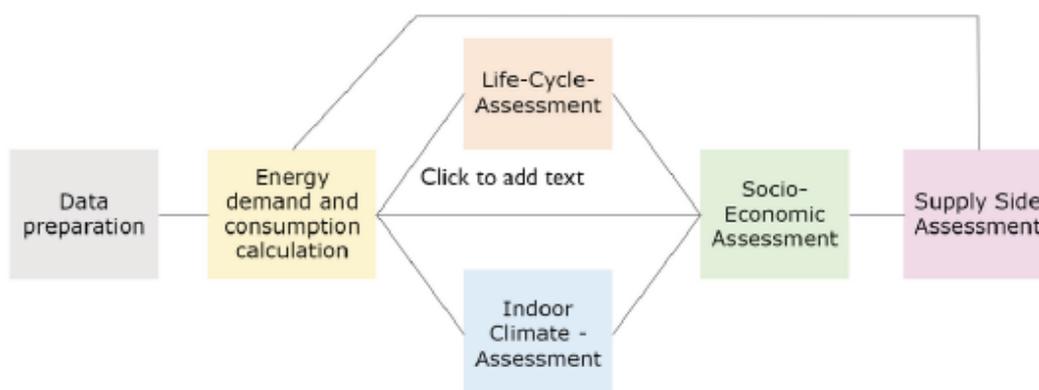
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ASSESSMENT MODULES

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DATA MANAGEMENT AND PREPARATION

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SUPPLY SIDE ASSESSMENT

Supply side assessment was integrated as a counterpart to the other modules. It assesses what would happen when all the investment is made on on-site or decentral renewable energy generation instead of energy efficiency. Some solutions are on-site PV, wind parks, biomass, etc. Outputs are:

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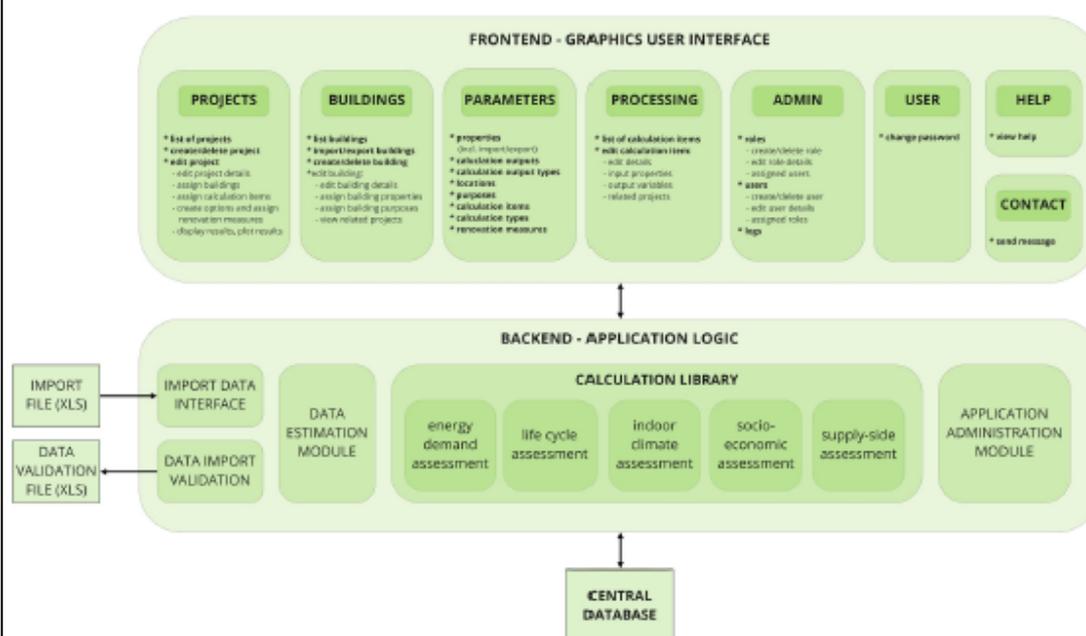
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EERADATA DECISION SUPPORT TOOL

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KEY RESULTS

The 5 assessment modules calculate outputs for single buildings or several buildings in a batch simulation. These outputs can be sorted by the directness of impact for the planning and investing entity:

1. WITHOUT BENEFITS, ONLY ENERGY RELATED SAVINGS

- Energy cost reduction
- Payback time: baseline

2. WITH WIDER SOCIO-ECONOMIC BENEFITS

- + Reduction of sick days among teachers
- + Increase of teachers' performance
- + Tax returns (income and trade tax)
- + Reduction of CO2 emission cost (Tax, Emission Trading costs)
- Payback time: reduction up to a factor of 5-15

3. WITH SOCIETAL SOCIO-ECONOMIC BENEFITS

- + Increase of pupil performance due to higher learning performance in school
- + Reduction of sick days among pupils in schools
- + Job creation and related reduction of unemployment expenditure
- + Reduction of social CO2 emission cost
- Payback time reduction up to a factor of 15-45



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4. TO COMPARE SUPPLY SIDE ASSESSMENT

- Energy cost savings

PROJECT CONTACT AND DST TESTING OPPORTUNITY:

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Annex 2: Conference agenda



EERAdata

FINAL CONFERENCE AND STAKEHOLDER NETWORKING EVENT

Supporting local and regional energy efficiency decisions through assessing socio-economic and environmental benefits

PLACE AND VENUE: ONLINE
DATE: THURSDAY, 9TH DECEMBER 2021
TIME: 09:00 – 13:30

The conference will bring together key stakeholders working in the field of energy renovation of buildings to jointly address the challenges and barriers of better understanding and quantifying wider benefits of potential Energy Efficiency investment projects.

The EERAdata consortium will present newly developed approaches embodied within an online decision-support tool (DST), with the ambition of facilitating more effective strategic planning in the scope of the vision of the renovation wave.



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EVENT PROGRAMME

MORNING I

09.00 – 09.30 Registration and login

Participants are joining the assembly through the web platform gathertown

09.30 – 09.40 Welcome and introduction

Introductory address to participants (Host: TUM)

Agenda overview (Host: COAMA)

09.40 – 10.00 EERAdata in a Nutshell

Project Introduction and its relevance for EU climate/energy policy (TUM)

10.00 – 10.15 European policy on energy renovation/ EEFP

Christophe Milin, Project Officer CINEA

10.15 – 10.30 Insights from partner countries #1 Slovenia

Ministry of Infrastructure, Energy directorate

Long term strategy for mobilizing investment in energy renovation of buildings until 2050 (DSEPS 2050) – Where we are and where we are going.(TBC)

10.30 – 10:45 EERAdata Case Study and Key Results

Prof. Jorn Toftum, Rune Korsholm Andersen, Technical University of Denmark

10:45 – 11:00 Coffee Break



This project has received funding from the European Union's Horizon 2020 research and innovation





EVENT PROGRAMME

MORNING II

11:00 - 11:15 Insights from partner countries #2 Denmark

Annette Egetoft, Energispring. (TBC)

11.15 - 11.30 Showcasing the EERAdata DST

Rafael Abad Cano, Collegio de Arquitectos de Malaga

11:30 - 11:45 Insights from partner countries #3 Spain

Jorge Ruiz, AVRA: Renovation cases for social housing complexes.

11:45 - 12.00 Data management in EERAdata

Sebastian Bruhn, City of Copenhagen and Tobi Elusakin, Trilateral Research

12:00 - 12:30 Lunch Break

AFTERNOON

12:30 - 12:45 BayFOR, Bavarian research Alliance impulse

Susanne Hirschmann, BayFOR: Research Programs, Upcoming calls and opportunities to continue with EERAdata results



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EVENT PROGRAMME

12:45 - 13:20 Implementers Feedback Panel discussion

Impulse Lecture: Pegah Noori Khah, C40

Panellists will be published soon.

13:20 - 13:30 Wrap Up, Outlook and Use cases for the EERAdata DST

Sebastian Botzler, Technical University Munich

EERAdata (Data-driven decision-support to increase energy efficiency through renovation in European building stock) will contribute to the understanding and operationalisation of the Energy Efficiency First Principle by defining variables, indicators, and methodologies to assess the socioeconomic and environmental impact of EE investment in building stock. The EERAdata partners have built a user-friendly tool which will allow local administrations to carry out this assessment with ease, using their own data as well as relevant open data sources. Anonymised data of assessments performed with the other implementing partners will also be incorporated.



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