

Project CARE: Facilitating data-driven retrofits to alleviate energy poverty in Warsaw

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Urban policies face significant challenges in addressing energy poverty and renovating municipal buildings. Polish cities lack comprehensive tools for monitoring, diagnosing, and planning housing stock renovation. They also make limited use of available administrative data from other entities in these processes. To tackle these issues, the CARE project (*Carbon-neutral and Affordable Retrofits for Everyone in Need*), carried out in partnership with the City of Warsaw and supported by the ICA Fund (C40 Cities), has developed a dedicated tool to diagnose and design the energy renovation of municipal buildings in Warsaw.

Measuring energy poverty at the local level according to dimensions and indicators commonly accepted in the literature presents a challenge. Public statistics in Poland do not provide data on households, such as the number, energy expenditures, incomes, below the regional level. This aggregation makes it challenging to map energy poverty and effectively assist those in need. However, the availability of other data sources that help identify the drivers of energy poverty is increasing. As part of the CARE project, conducted in partnership with the City of Warsaw and supported by the ICA Fund C40 Cities, we focused on 1,900 municipal buildings in Warsaw and their residents. This focus was driven by the prevalence of energy poverty within this housing stock and the city's agency over these buildings.

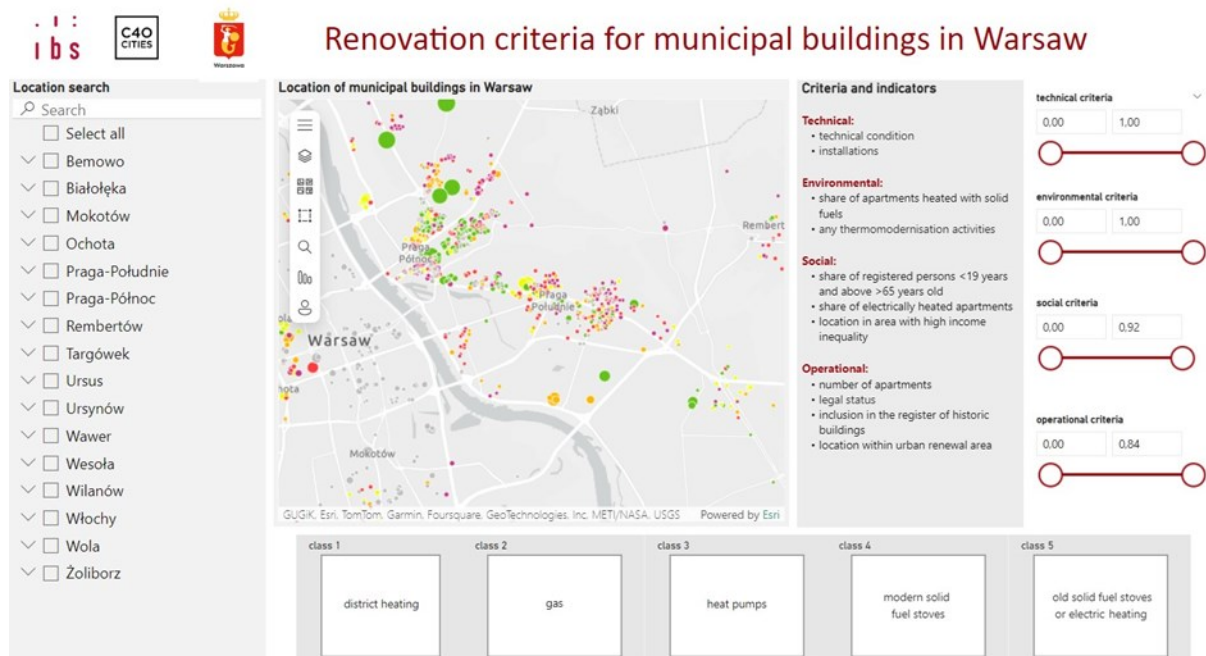
Municipal buildings in Poland, intended for less wealthy people, are highly diverse in terms of their technical condition, number of units, and occupancy rates. The increasing priority of decarbonisation and the need to mitigate socio-spatial inequalities in cities necessitate an optimal sequence of energy renovations. Balancing social, environmental, and economic goals is essential to effectively meet this challenge.

In the project's first phase, we consulted stakeholders representing various sectors involved in social housing, including municipal government units, tenant organisations, and institutes researching urban policies and housing. In the second phase, we collected and integrated dispersed administrative data, considering the following datasets:

- Urban data on municipal buildings, technical condition, and number of apartments;
- Central Emission Register of Buildings (CEEB) with data about heating sources;
- Land and Property Register (EGiB) about buildings and their profiles;
- National Register of Boundaries (PRG) with verified address points;
- Personal Identity Number (PESEL) with data about the number and structure of people living under a particular address;
- Statistics Poland (GUS) kilometer grid data about incomes in Warsaw.

The starting point for developing intervention criteria was the official listing of municipal buildings registered in the urban database. Through consultations with the City of Warsaw, we developed and agreed upon criteria and indicators incorporating various aspects of building renovation. Eleven selected variables were assigned to four criteria: technical, environmental, social, and operational. During the data analysis stage, we applied equal weights to the defined criteria and variables. The tool prepared for the City of Warsaw allows for the modification of weights

and the development and comparison of different building renovation scenarios. The available administrative data enabled the complete classification of 65% of municipal buildings.



The above dashboard shows classified municipal buildings according to the initial scenario, with equal weight assigned to all variables and criteria. Buildings requiring particular intervention are marked in pink, red, and orange. Gray indicates buildings that are unclassified due to data gaps. According to the city administration's statements, the relevant municipal units at the neighbourhood level will gradually fill data gaps.

The analysis yields four main conclusions:

- Energy renovation of buildings requires cross-sectoral and interdisciplinary cooperation, agreements between various municipal units, and shared, periodical communication channels;
- The current urban monitoring framework does not fully allow for assessing the scale and effectiveness of energy renovations in terms of future investments, including implementing EU directives on reducing emissions in the housing sector;
- The specific nature of the municipal housing stock and the current stage of the urban housing data monitoring system make integrating administrative data challenging;
- CARE project enabled the development of a tool and a scenario for energy renovation of municipal buildings that balance social and environmental goals rather than direct energy poverty measurement.

In light of these conclusions, we propose four recommendations and outline their implementation:

- **Recommendation 1: Establish a working group to regularly develop an action plan for energy renovation of municipal buildings based on the prepared intervention index.**
 - Consider the needs of people waiting for municipal building apartments and those in energy poverty already living in housing stock;
 - Define the role of operational criteria for energy renovation (e.g., location in an urban renewal area, legal and heritage status of the building).
- **Recommendation 2: Define energy renovation and introduce measurable criteria for building energy efficiency.**
 - Expand the urban housing data monitoring system on the information about the scope of energy renovation activities undertaken;
 - Enable automatic data migration from energy audits and the energy performance certificate database;
 - Monitor relevant municipal units at the neighbourhood level to ensure regular updates of information;
 - Expand the scope of analyses to include data on energy classes concerning changes required by the EPBD directive;
 - Consider integrating data with a tool to estimate the energy renovation costs.
- **Recommendation 3: Ensure the interoperability of the urban housing data monitoring system with other registry data and complete missings.**
 - Introduce a unique ID for municipal buildings consistent with the Land and Property Register.
 - Complete the Central Emission Register of Buildings with heat source information for municipal buildings without entries;
 - Verify the status and number of residents in the given municipal buildings.
- **Recommendation 4: Further develop the urban housing data monitoring system to consider various dimensions of energy poverty.**
 - Attempt to expand the monitoring system to include buildings not owned by the city;
 - Support initiatives to make income registry data available for research through consultations with the Ministry of Finance and tax offices;
 - Monitor and continue verifying the incomes of residents receiving support;
 - Conduct joint consultations between city office units and energy companies regarding data monitoring on building energy consumption.

The results of the analyses represent a set of best practices for monitoring building conditions, designing and implementing building renovation strategies, and reducing the scale of energy poverty. A key conclusion from the diagnosis conducted in Warsaw is the need for municipalities to perform analyses based on administrative data. This approach provides reliable, universal information and generates lower costs than ad-hoc surveys. Based on the data sources indicated in the study, the CARE project methodology used in Poland's largest city can also be successfully applied in other municipalities.