



A multi-stakeholder partnership to eradicate energy poverty in Zagreb

Zagreb, Croatia

IN A NUTSHELL

A partnership between the NGO 'Society for Sustainable Development Design' (DOOR), the city council and the University of Zagreb trained university students to carry out simple energy audits in households that have trouble paying their energy bills and to implement low-cost energy improvements.

Joining forces against energy poverty in Zagreb

With more than 50 million households in the European Union having trouble paying their energy bills, many cities, together with national governments and the EU, are acting to eradicate energy poverty. The City of Zagreb has decided to eradicate energy poverty, building on an understanding of the links between lack of access to affordable energy, poverty, inequality and environmental challenges. Inefficient building insulation and heating systems increase household expenditure on energy services, which can create both an economic and a health burden for many households. It can also cause health-related problems arising from mould, cold and low indoor air quality, and reinforce the conditions of poverty for the most vulnerable population groups, exacerbating social inequality in cities. At the same time, inefficient buildings with high demand for energy generated from fossil fuels contribute to higher greenhouse gas emissions than efficient dwellings.

In 2018, the City of Zagreb set up a multi-stakeholder partnership to fight energy poverty in an integrated manner: delivering positive social outcomes while reducing energy consumption and contributing to the city's greenhouse gas reduction target of 40% by 2030. To do so, it partnered with the Faculty of Electrical Engineering and Computing at the University of Zagreb, and with the Croatian civil society organisation DOOR (Society for Sustainable Development Design), to initiate the 'Fair (FER) solutions for a better community' project. The project involved DOOR training students to carry out simple energy audits and implement low-cost energy improvements in energy-poor households in Zagreb. With a total amount of kn1,167.759.73 (around €156,000), the project was funded through the European Social Fund and Croatian state budget via the Government Office for NGOs.



Student collecting energy data as part of household energy audit. © Society for Sustainable Development Design (DOOR)

ZAGREB



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| Population: 806,341 (2019) | Area 641 km ² |
| Signatory to the Covenant of Mayors since: 2008 | CO₂ emission reduction target: 40% (2030) |

Building the skills of students for a fair energy transition

The project focused on engaging students to help vulnerable households reduce energy consumption, while building their skills as part of a university programme. The project had multiple objectives: mapping energy-poor households in Zagreb, implementing low-cost energy-efficiency measures, and providing advice on how to reduce energy use. During an initial mapping and training phase, a group comprising fifteen students, researchers and university teachers was trained by experts to carry out social field research and energy audits, as the topic of energy poverty was not part of the engineering curriculum at the time the project started. The city council identified vulnerable households to target and solicited statements of interest from them for participation in the project. Students conducted field visits to carry out simple, low-cost energy efficiency interventions and gather data through surveys.

Measures implemented in 102 households and long-term benefits

In the timeframe of two years, 102 household visits resulted in improved living conditions via simple low-cost energy-efficiency measures such as energy-efficient LED bulbs, draught-proofing of windows and doors, water-saving aerators, timers for electric boilers, etc. that were installed by students at no cost. Using standard calculations, these measures can save households around 200 kg CO₂/year, and more than 1200 kWh/year in electricity and heat. The students also advised households on the most cost-efficient and energy-saving measures, based on a model for wall-retrofitting investments developed as part of the programme. The model showed wall-retrofitting investments with external thermal insulation to be cost-effective for 40.3% to 58.1% of households (depending on heating systems and wall materials) with a payback period of under 10 years, and with other ancillary benefits such as improved human health due to better living conditions.

These concrete social benefits were complemented by insights from the household survey that allowed researchers to obtain a picture of energy poverty in Zagreb. The data analysis revealed that “most of the households visited live in buildings without any thermal insulation, a significant percentage of which are heated with electricity.”¹ This confirmed that “a significant percentage of citizens live in low-energy-efficient dwellings, with reduced heating during winter and with draught and mould problems.” In terms of demographics, the energy-poor households visited consisted mainly of elderly people, people with disabilities, and users of various social services. With regard to their occupation status, the two most-represented groups were retirees and the unemployed. Another key finding confirmed that the main conditions for energy poverty were present in most households: low household income, high energy prices and inefficient dwellings.

KEY FIGURES

2-year project

102 energy-poor households audited

200 kg CO₂/year estimated savings per household

1200 kWh/year estimated savings in electricity and heat per household

15 engineering students trained

One new university course introduced



FINANCING THE PROJECT

- + **Financing source(s):**
European Social Fund and Croatian state budget via the Government Office for NGOs
- + **Total amount:**
kn1,167,759.73 (around €156,000)

1. Grdenić, G., Delimar, M. & Robić, S., 2020. Framing the context of energy poverty in Croatia: A case study from Zagreb.

Zagreb has used the recommendations² from the survey and the energy retrofit financial assessment model to promote legislative changes and provide energy-poor citizens with better protection and support. Recently, the city added a definition of energy poverty to the 'Zagreb Strategy for Combating Poverty and Social Exclusion for the period 2021–2025'.³ Zagreb is the first city in the Republic of Croatia to design and adopt a strategic document dedicated exclusively to the prevention of poverty and social exclusion. In light of the social, health and economic consequences of the pandemic, which have increased the burden on the people at greatest risk of poverty and energy poverty, the city aims to direct future activities towards them more effectively. One of the strategy's pilot measures will replicate the project's actions, providing simple, low-cost energy-efficiency measures to energy-poor households. Moreover, the engagement of NGOs, students and academia has helped Zagreb foster a strong partnership, setting the basis for further multi-stakeholder collaboration in the future.

On top of providing increased visibility for this topic, the project has provided educational benefits for current and future students, integrating energy poverty into the university curriculum. Teaching students to carry out simple energy audits and implement field research methods, and improving the transfer of knowledge and skills by university staff will help engineering students become change agents for a fair energy transition.



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USEFUL LINKS

- ▶ [Project website](#) (in Croatian)
- ▶ [Project information on the official website of the City of Zagreb](#) (in Croatian)
- ▶ [Fact sheet](#) (in English)



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Energy Policy, Volume 147.

2. DOOR, 2020. Recommendations for combating energy poverty in the City of Zagreb (in Croatian).

3. Zagreb, 2021. Zagreb Strategy for Combating Poverty and Social Exclusion for the period 2021-2025 (in Croatian).