The challenge of identifying hidden energy poverty

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Energy poverty is a situation in which households are unable to access essential energy services. With nearly 34 million Europeans unable to afford to keep their homes adequately warm, energy poverty is a major challenge for the EU. One of the challenges to tackle this social priority is the complexity to identify people suffering a situation of energy vulnerability as it occurs at domestic level. This facts explains why local authorities play a key role implementing solutions. Energy Poverty Intelligent Europe (EPIU) identifies, attends and fight hidden energy poverty combining data analytics, cross-disciplinary municipal work, tailor-made solutions and citizen collaboration.

Getafe on a nutshell

Located in the south of Madrid, Getafe has a strong industrial sector that has led to exponential growth of its population in the last 60 years: from 19.224 inhabitants in 1960 to 185.589 in 2018. The demographic expansion experienced from the 1960s to 1980 generated 52% of its current housing stock due to an urgent need of urbanization. These dwellings are inefficient in terms of energy use and do not meet adequate energy efficiency standards nor have heating systems in most cases. This situation is exacerbated by Getafe's extreme temperatures varying from 0°C to 33°C. Besides, an air military base in the city caused an important urban sprawl due to the limitation of the buildings' height following flight safety requirements. Regarding income, Getafe has a lower income than the rest of the region with a medium disposable income of 21.783 € while 26.854 € is the average at Madrid Region. Two areas in the city unite both characteristics (poor housing quality and lower income) and has been declared by Regional Government in October 2018 as critical areas for refurbishment regeneration (ARRU): Margaritas and Alhóndiga-Fátima. These Urban Deprived Areas and Neighborhoods (UDAN) have a population of 10.650 inhabitants, mainly elderly neighbors and migrants (28%), 48% without heating systems.

EPIU consortium

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Energy poverty is a multidimensional challenge that needs different approaches. EPIU project has been designed taking into account expertise at different levels. In order to find a good solution to tackle hidden energy poverty, Getafe's municipality (MUA) is accompanied by:

- EMSV, the local housing public company
- Universidad Carlos III, with three research teams involved:
  - Appropriate Technologies for Sustainable Development Group (GTADS) Control Learning and Systems Optimization Group (CAOS
  - Sociology of Climate Change and Sustainable Development (SCCDS)
- ACA-Asociación de Ciencias Ambientales, as one of the reference organizations tackling energy poverty in Spain
- FN - Fundación Naturgy, the foundation of one of the biggest energy suppliers in Spain
- Khora Urban Thinkers as experts on public management
- UPM - Universidad Politécnica de Madrid with two research teams involved
  - GIAU+S (Architecture, Planning and Sustainability research group)
  - ABIO (Bioclimatic Architecture in a Sustainable Environment).
- Red Cross on its division in Getafe (CR Local Assembly of Getafe)
- FLC - Fundación Laboral de la Construcción representing entities of the employer's associations and trade unions of the construction sector and ensuring the effectiveness of the communication's plan of the project.

Other relevant stakeholders such as Instituto para la Diversificación y ahorro de energía (IDAE), Airbus,

Comunidad de Madrid, Ecologistas en Acción or Triodos Bank are members of the EPIU's Technical Committee.

EPIU expected results and potentialities for replication and scalability

Energy Poverty Intelligent Unit has been designed to reduce energy poverty in Getafe but also to become the reference tool to identify and to tackle hidden energy poverty.

On one side, the project will quantify and qualify identified Hidden Energy Poverty (HEP) in order to gain a deeper understanding of the problem and to determine which public interventions work better and under which circumstances. On the other side, with the specific public service, EPIU aims to become the referent one-stop-shop in Getafe to identify and tackle situations of energy poverty in the area. Citizens will be more aware about risks, negative impacts, public services available and potential actions to reduce energy vulnerability in their homes, buildings and neighborhoods.

In terms of replicability and scalability, EPIU project presents different ways to grow beyond the UIA:

1) One option is to expand the model to the entire city and for other sectors too such as SMEs or to local shops. EPIU is originally designed for two neighbourhoods and data gathering could be easily applied to the whole city. Machine learning would allow a less intensive need of direct data.

2) Another option is to extend the scope to other sectors. Data analytics model is originally intended for the city council to identify energy poverty but it could be useful to other actors: academic institutions that study any social data included in the model, construction companies to identify energy inefficient homes and buildings, energy suppliers to identify homes without installations or inefficient buildings.

3) To replicate the horizontal working methodology for other issues is a possibility too. Collaboration between areas is one of the keys of this project and any project affecting more than one area could benefit from it: monetary poverty (social services, education, health), unemployment (local economy, social services, education), climate change (environment, mobility, energy, consumption)...

4) Last but to least, to bring EPIU model at regional level is feasible too. Scalability of the model, data analytics, service design and knowledge acquired on this topic will be very valuable for cities and towns of the region.

More on EPIU

The project will be running until 2023 so stay tuned to know how it is progressing on EPIU's website https://hogaressaludables.getafe.es/en/

Or social media channels:

You Tube: https://www.youtube.com/channel/UCaE9esoYPZng6jW3bXk7yng?

Instagram https://www.instagram.com/epiugetafe/

Twitter https://twitter.com/epiugetafe

EPIU solution

Innovation lies in a change in approaching energy poverty situations: from reaction to prevention using data. EPIU is based on a data analytics system that collects information on energy consumption, income and other factors determining a situation of energy poverty. The system clusters vulnerable groups by their sociodemographic and physical characteristics taking into account three scales of intervention: household, building, and neighborhood. A cross-disciplinary work team composed of several areas of Getafe municipality and its housing company will be in charge of energy vulnerability cases detected by the tool and will value the implementation of tailor-made solutions and the compensatory engagement actions. Tailor made solutions will be developed for both heat and cold energy poverty for a selection of energy poverty affected people, their households, buildings and neighborhoods.
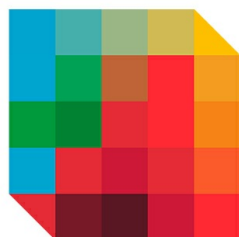
EPIU will identify, attend, prevent and fight hidden energy poverty (HEP) combining data analytics, cross-disciplinary municipal work, tailor-made solutions and citizen collaboration.

This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative

EPIU Getafe
Hogares saludables

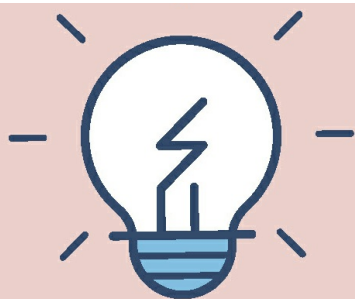# ENERGY POVERTY INTELLIGENT UNIT

UIA initiative

PHASE 1: CITIZENS ENGAGEMENT

Communication campaign to involve citizens and Getafe community

PHASE 2: DATA MANAGEMENT

-Identification , analysis and clustering

PHASE 3: LOCAL PUBLIC SERVICE

PHASE 4: TAILORED SOLUTIONS

At three levels: household, dwelling and neighborhood

PHASE 5: MONITORING AND EVALUATION

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Urban poverty

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