



# WHY

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CLIMBING THE CAUSALITY LADDER TO UNDERSTAND  
THE ENERGY DEMAND ON THE RESIDENTIAL SECTOR  
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[www.why-h2020.eu](http://www.why-h2020.eu)  
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#whyh2020  
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 @whyh2020project  WHY-Project  why-project  
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**WHY is the next step in improving energy demand modelling to forecast the domestic sector's energy consumption.**

**The WHY project develops innovative methodologies and a toolkit for short- and long-term household energy consumption modelling. Use cases benchmark these models ranging from local to European-wide energy grids. The WHY Toolkit builds on the causality chain to model the energy demand, building on relations between measurable variables.**

## Innovative Energy System Modelling

Energy System Models (ESMs) are tools that help energy experts and policy makers to describe energy systems and evaluate the impacts of long-term energy scenarios. Current ESMs lack accuracy required for proper capture of the use of energy in households. The partners of the WHY project develop a new Causal Model combined with an innovative profiling approach to analyse human decision making in energy consumption in the residential sector.

WHY will create innovative methodologies for short- and long-term load forecasting. The WHY Causal Model and the WHY Toolkit will be used to assess several scenarios simulating different policy measures. The developers will demonstrate how to integrate the WHY Model with widely-used ESMs (PRIMES, TIMES). This will allow experts and policy-makers to assess tailored implementation possibilities. To support this, five use cases will evaluate different policy scenarios with special focus on the EU Green Deal and the Renovation Wave policies.

## Let's talk about the Causal Model

In order to mitigate climate change effects, urgent action is required in all sectors of the economy to significantly reduce greenhouse gas emissions. On the supply side, ESMs have provided useful results, but on the demand side, they lack the degree of accuracy required for proper characterization of the use of energy in households.

To overcome this challenge, the new Causal Modeling will be used to quantitatively analyse human decision making in energy consumption and their reactions to interventions (e.g. policy changes). This will be combined with an innovative FFORMA approach (Feature-based Forecast Model Averaging) which allows multiple different load profiles to be categorised by a set of vectors describing it. The WHY Model will allow to assess the impact of a variety of policies on the energy system directly. All results will be open-source and available via multiple channels.



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