

DREAM: Demand Response Energy Awareness Model

A co-designed tool for exploring household energy flexibility through building simulation

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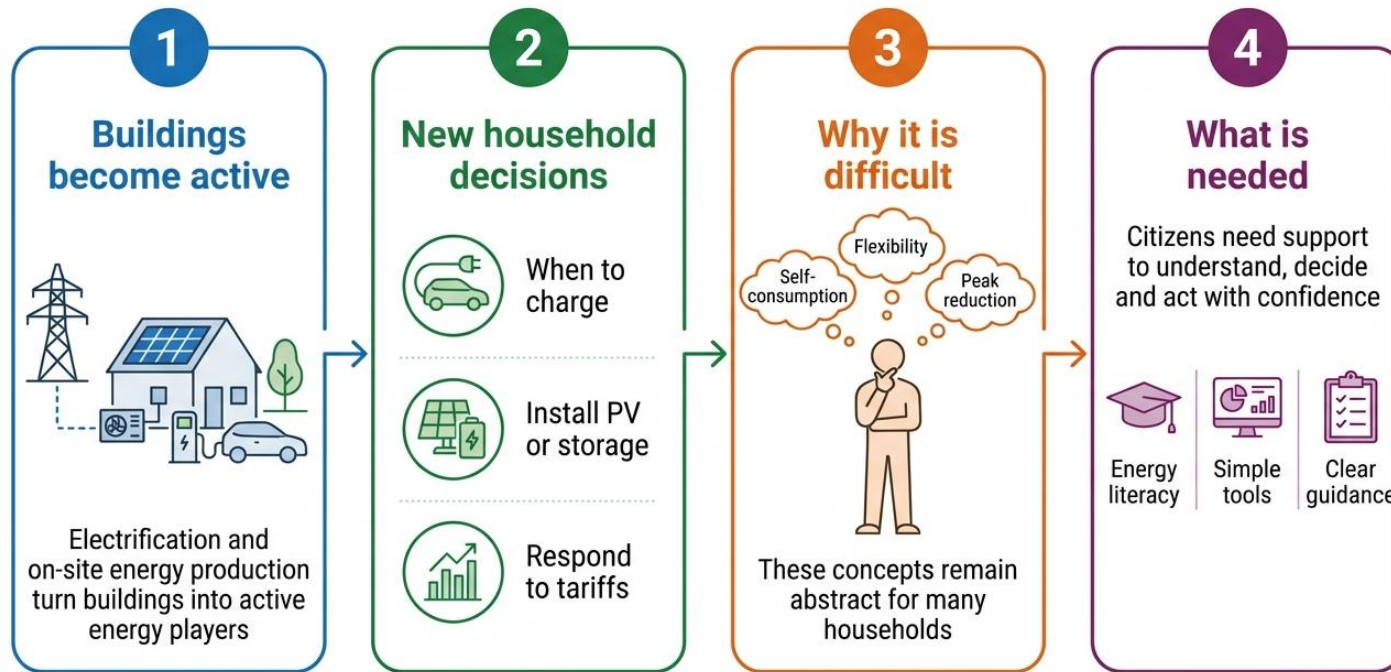
brenet Status-Seminar 2026

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20 August 2026
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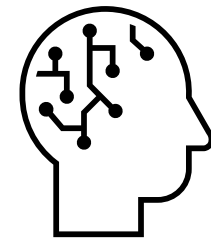
From consumer to prosumer: why citizens need support



Energy transition requires not only technologies, but also energy literacy.

DREAM

A web-based tool that helps users understand energy systems and flexibility by simulating their own home.



My home

What-if scenarios

Impacts

How does DREAM work?

Simple for the user, physics-based underneath

1. User inputs

The frontend guides the user through a small set of inputs on the dwelling, systems and preferences

2. Data enrichment

The tool enriches inputs with Swiss building information when available

3. Simulation

Using Python and EnergyPlus, the backend converts simple user inputs into a virtual building and household energy model and simulates it for an entire year

4. Results generation

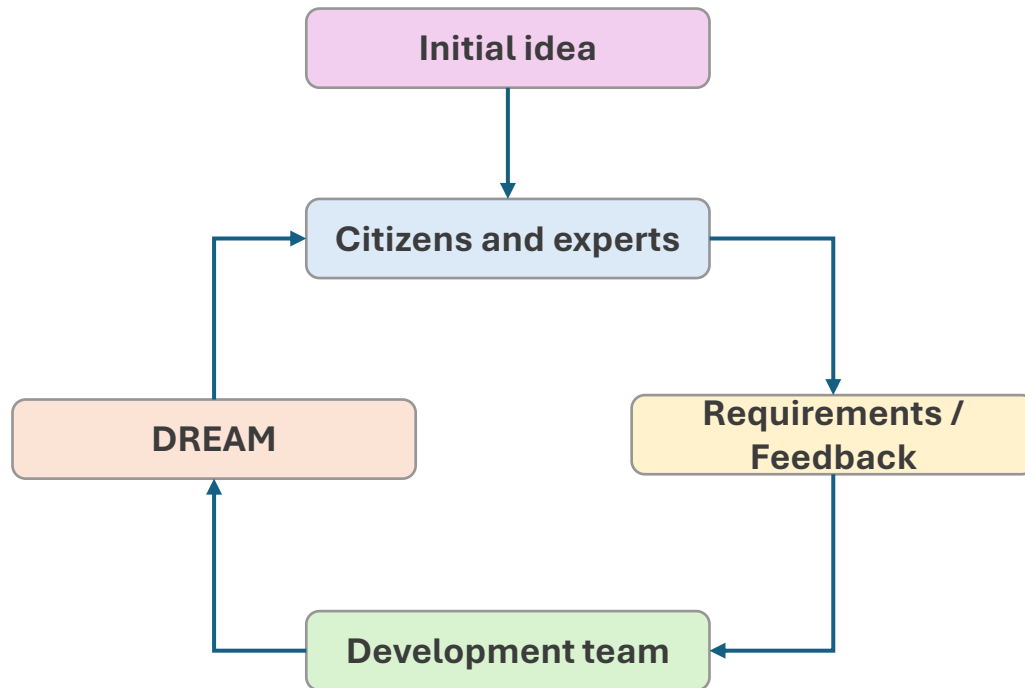
Results are turned into intuitive KPIs and representative day profiles

5. Scenario comparison

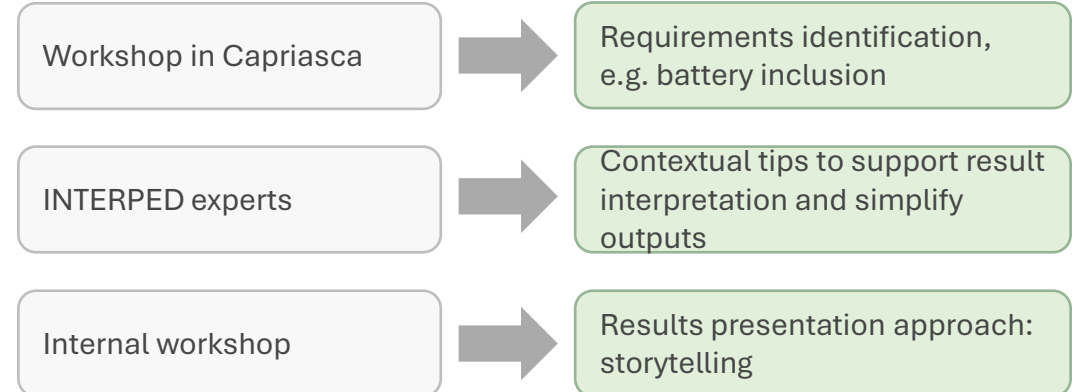
DREAM automatically creates and compares three scenarios: baseline, upgrade and flexibility

Co-design shaped DREAM

The webtool is evolving through an iterative dialogue with citizens, experts and stakeholders: Feedback has reshaped both inputs and outputs



Concrete changes from feedback



What can users learn from DREAM?

Questions DREAM can help answer

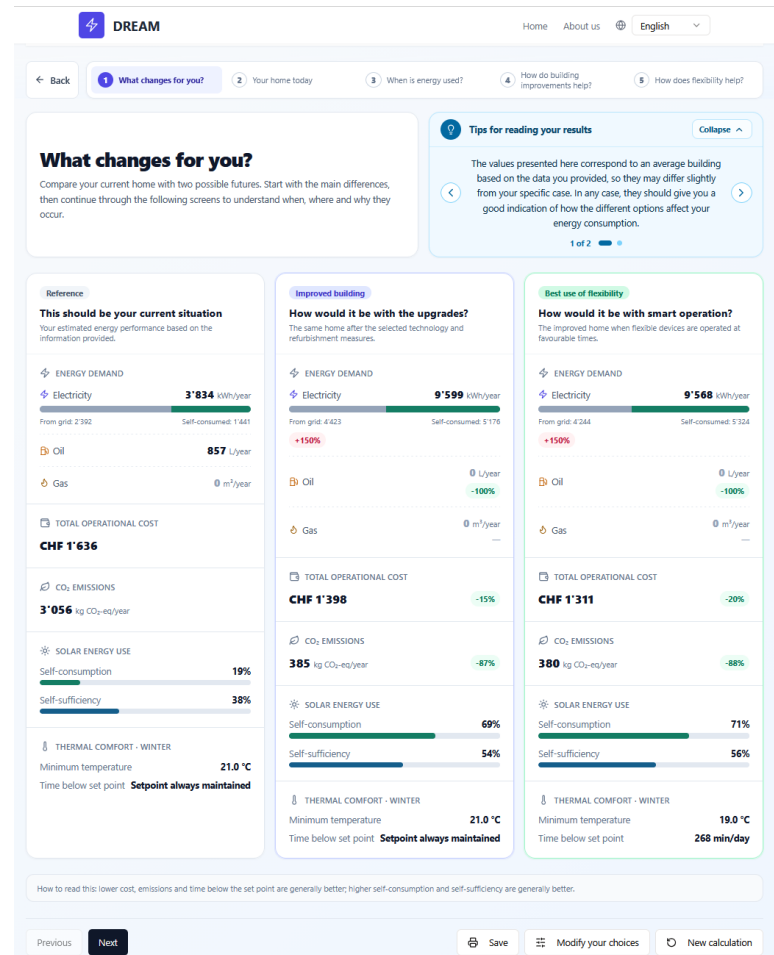
How is my current energy consumption distributed?

What happens if I install a battery?

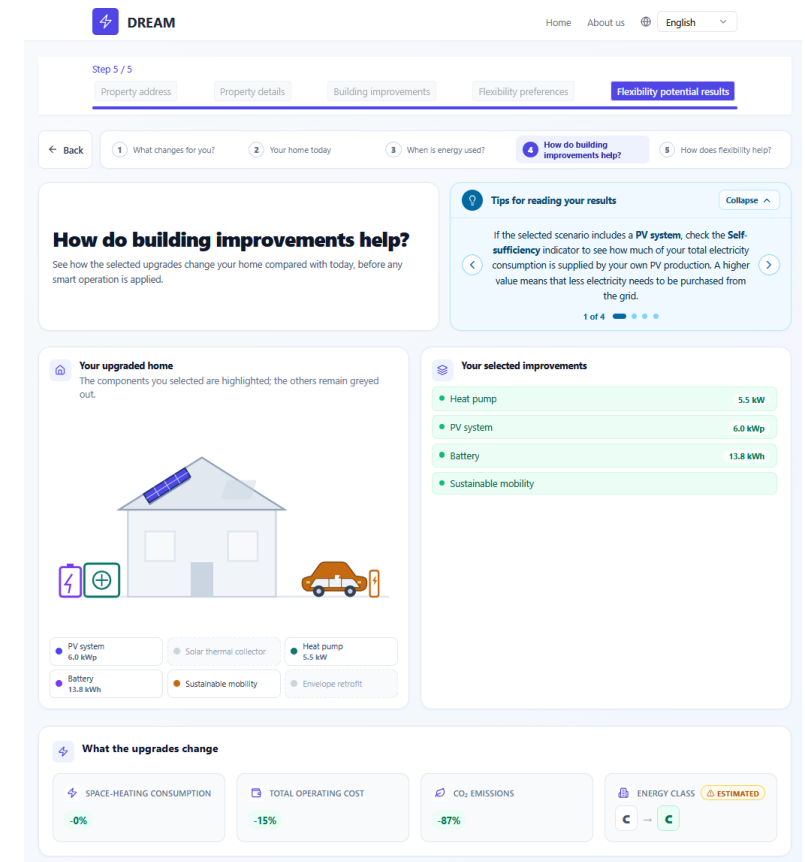
How does smart EV charging affect my self-sufficiency?

Why do timing and dynamic tariffs matter?

Which flexibility measures are available, and which are most effective for my home?



<https://dream.dacd.supsi.ch/>



DREAM is still evolving

Development continues through repeated cycles of co-design, testing and user feedback

Next steps

Refine outputs

Iteratively improve the storytelling with user feedback

Investment module

Add information on investment and payback

Multifamily buildings

Define how to represent shared buildings without overloading users

Community level

Move from single homes towards energy communities

DREAM helps citizens understand not only their home, but eventually their role in a more flexible energy system

Thank you for your attention!

Questions?

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We invite you to use DREAM and provide feedback!

