

Real-Life Energy Intelligence: IoT-Enabled Monitoring at Scale with Living Energy

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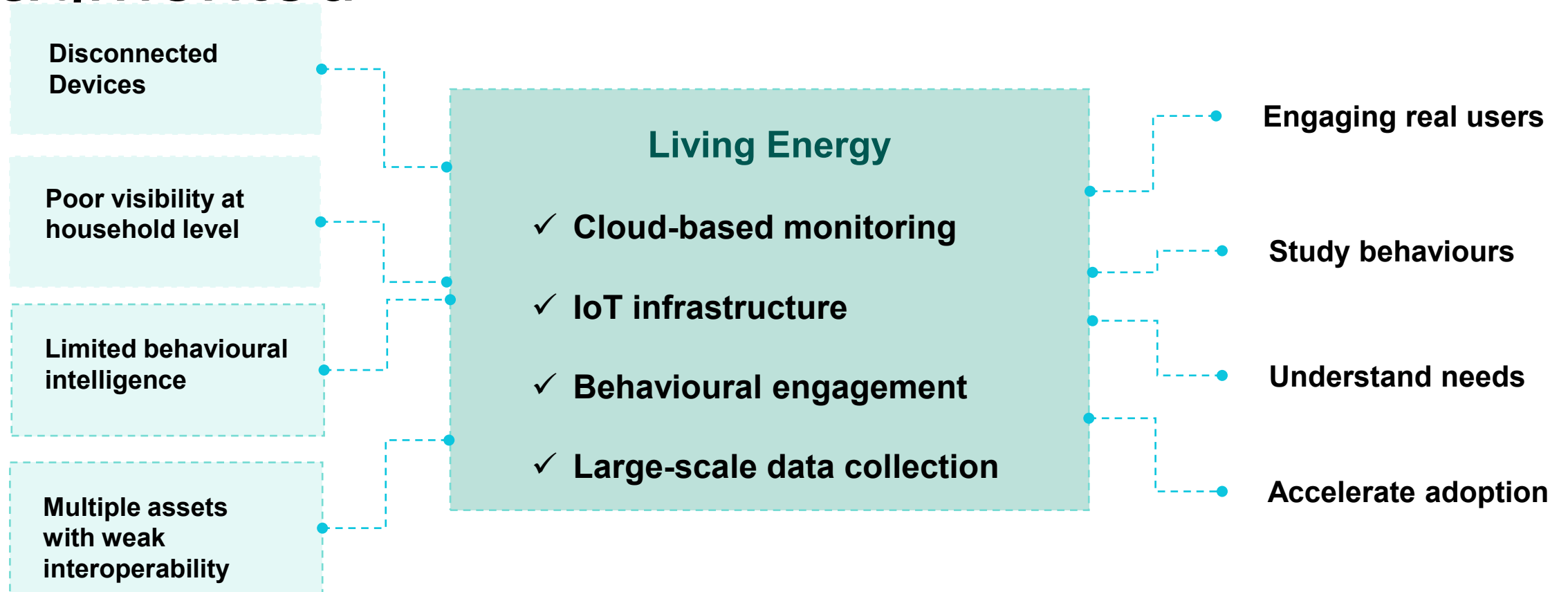
Digitalization and AI Accelerating Discovery and Optimal Processing of Important Clean Energy Inputs



**AI is only as good as
the real-life energy
behaviour data it
learns from**

Data layer is highly fragmented

Energy transition is becoming most complex in households. There are multiple assets being deployed, flexible demand, and increasingly active consumers. **We lack understanding of what is happening inside homes.**

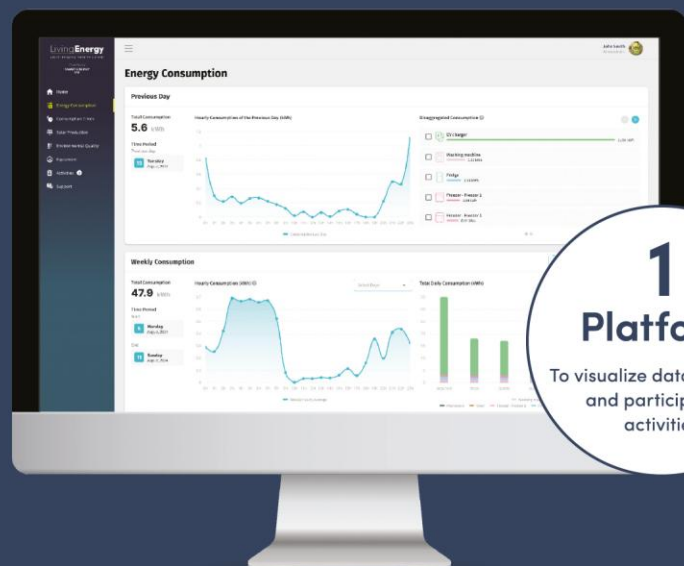


Our Living Lab consisting of living-buildings, such as residential or services, that allows to better understand how people use energy and their preferences in real-life.

Living Energy was specially designed to serve key players in the energy ecosystem—utilities, aggregators, regulators, and policymakers—through continuous collaboration, offering valuable insights and actionable feedback from our engaged community.

It's an invaluable tool for industry R&D departments and academic research units. Proof of that is our involvement in ongoing Horizon Europe projects Enerhsare, EV4EU, Reeflex and Communitas, allowing them to develop and test Energy Transition related solutions in real-world environments.

The Living Lab



1 Platform

To visualize data collected and participate in activities

+350M
Datapoints

1-15 min
resolution
Collection frequency
(H&T and Energy)

+100
explorers

In national territory there are almost 100 houses with energy meters and H&T sensors installed

17
PV units

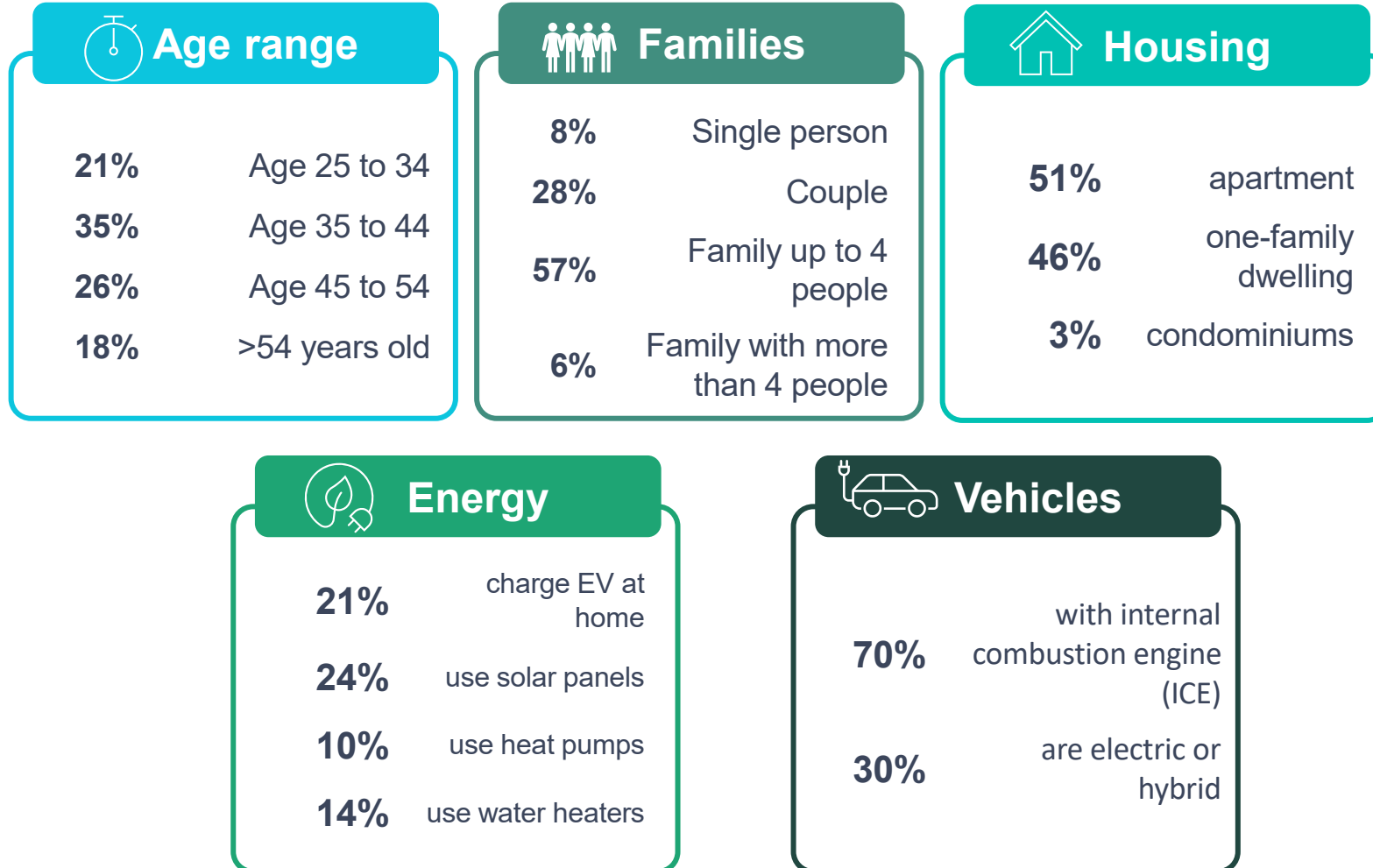
+290
MWh
Total Energy consumed

+25
MWh
Total Energy Produced

40
Electrical Vehicles

The Explorers

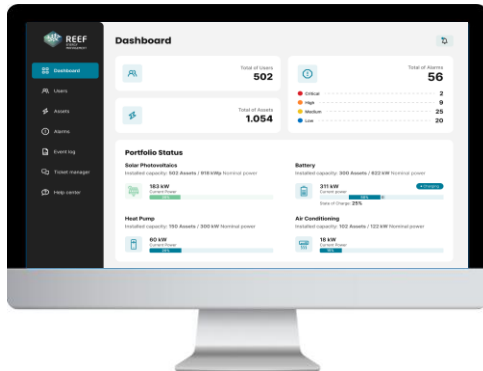
Our active community is spread along Portuguese territory represents different consumer's profiles.



An Edge-Cloud EMS solution with IoT

The SEL Platform allows designing, developing and deploying multiple cloud energy management **use cases**, user **interfaces** and **integrations**, leveraged on a set of **hardware components** installed on customer premises

Cloud-Based Digital features



Algorithms

Cloud Services (accessed via APIs or Portals)

Product Features (Platform/IoT integrations)



Local Extended Cloud Systems



- Integrated Electric panels
- Local Controllers
- Actuators

Call for Human-centric Approaches

Living Energy is an expert energy monitoring and visualization platform that uses technology and behavioral analysis to shape energy transition pathways.



Living Energy Platform

The **Living Energy Portal** offers:

- Direct interaction with participants
- User-friendly visualization of energy consumption and production, per household
- Real-time monitoring
- Energy analysis:
 - hourly intervals.
 - weekly, monthly and yearly comparisons

The Living Energy Portal is an internet platform developed as a user-friendly interface, allowing direct contact with the Explorers.



Living Energy Real-World Applications

The Living Energy intelligence layer is already used in several real-world applications, in collaboration with policy makers and European utility companies.



Energy Poverty

- Indoor environmental quality
- Humidity
- Thermal comfort
- Electrification pathways



Energy Communities

- Consumption aggregation
- Flexibility
- User engagement
- Collective intelligence



EV + Electrification

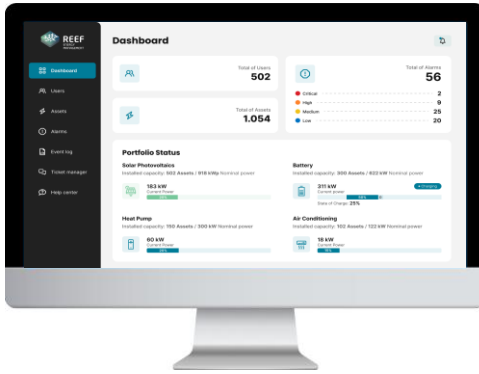
- Smart Energy Lab Cloud-based platform
- EV charging (EDGE)
- Energy efficiency management (REEF)

Smart Energy Lab R&D Products

Cloud-Based Platform



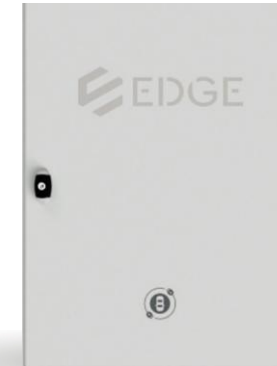
Local Extended Cloud Systems



- Algorithms
- Cloud Services (via APIs or Portals)
- Product Features (Platform/IoT integrations)



- Brand Agnostic
- Local Controllers
- Actuators



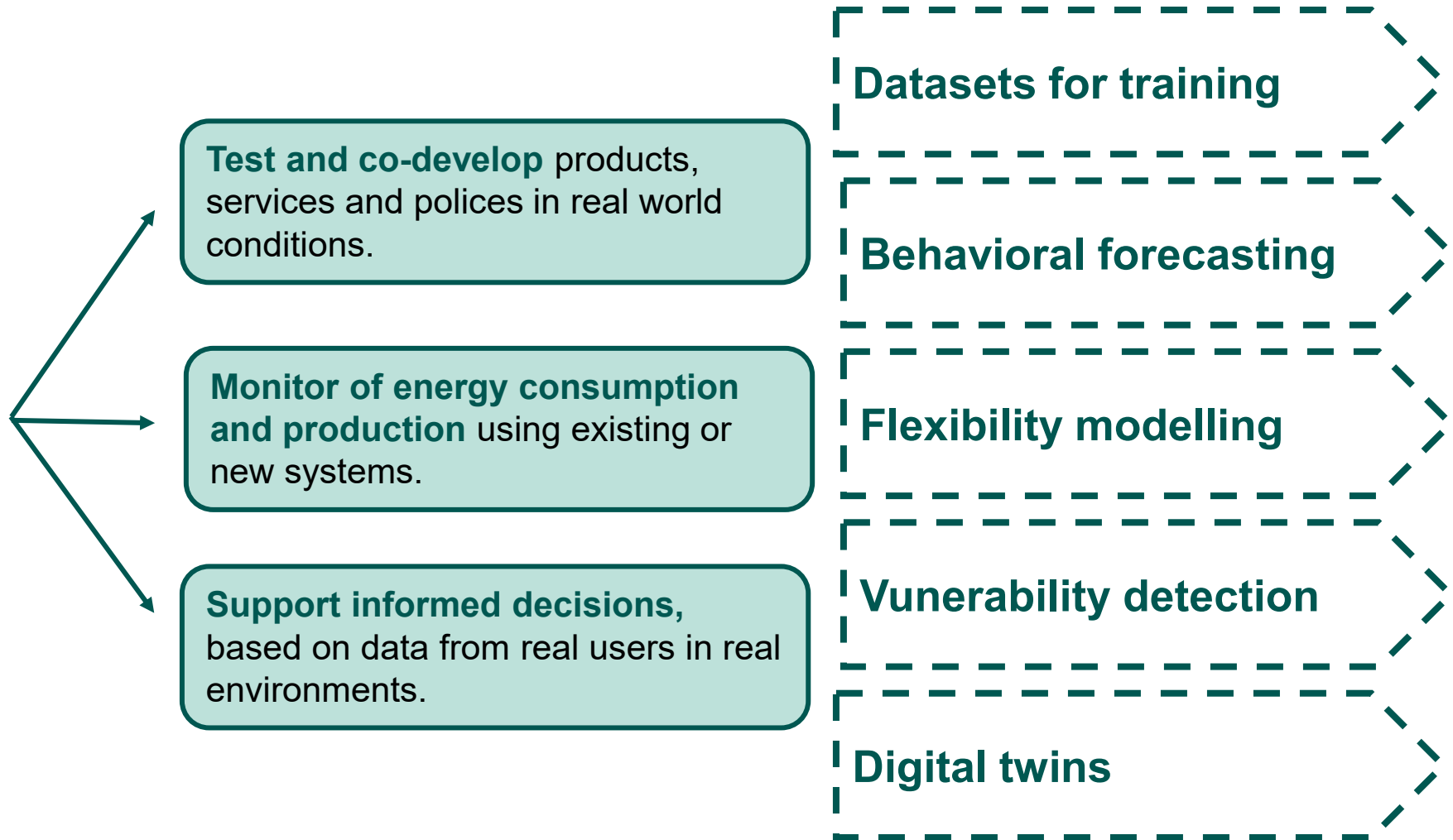
- Multiple charging points
- Plug-and-play
- Load management

Living Energy applications

Living Energy real world datasets may be used to improve AI predictive technology, distributed optimisation, automated flexibility and intelligent orchestration.

Living Energy
Lab for designing tomorrow's energy

Powered by
**SMART ENERGY
LAB**



Living Energy applications

Living Energy is a powerful tool to assist policy makers and utilities fight energy poverty, promote green buildings, foster decentralised production and to unlock household flexibility.

1

Energy Poverty Reduction

Real-time energy and indoor comfort monitoring identify vulnerable households and support targeted interventions

3

Energy Communities

Aggregating household energy data, enabling collective energy management, flexibility, user engagement and local resilience.

2

Green Buildings

Intelligent and energy-efficient buildings through real-time monitoring of consumption, comfort, solar production, EV charging and electrification patterns.

4

Distributed flexibility markets

Unlock household flexibility for EVs, solar PV, batteries etc. through high-frequency monitoring, behavioural insights and AI-ready energy data.



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Thank you

