



ReDREAM

change your energy

Technology Factsheet

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ReDREAM – Technology Solutions

Innovative technological solutions are key to implement the energy transition and to empower consumers to act at the centre of the energy system. In this factsheet, the EU-funded ReDREAM project presents its most important digital developments. All tools and solutions are developed in parallel with intensive research into the behaviour of energy consumers in 4 demo locations (UK, Italy, Croatia and Spain), to ensure their user-friendliness and added value for energy consumers.

The 8 technical tools and solutions have many features: Whether it's optimising the efficient use of energy based on the individual needs of consumers, or enabling demand response, with a tool that communicates with the smart grid and individual households. Other tools relate to comfort and mobility, to improve the understanding of the impact of mobility behaviour on energy consumption. The ReDREAM project also led to the development of energy interaction tools, using gamification elements and an innovative energy social network to let energy consumers connect and interact with each other.

We thank you for your interest in the ReDREAM technologies and look forward to hearing from you, and maybe even collaborate on future development of these solutions, so feel free to contact us.



Energy Efficiency tool

The main goal of the Energy Efficiency (EE) tool is to optimise thermal and electrical energy in buildings, apartments, homes, shops, offices, industries, taking into account different types of Distributed Energy Resources (DER) and user preferences (lighting and temperature), considering real-time conditions. Thus, the tool aims to manage those devices that can store electric or thermal energy to consume in the moments where prices are lower or solar energy is being generated, to reduce energy bills and pollution.

Smart devices are installed in manageable assets such as electric charging posts and heatpumps to know the region, tariffs and user habits. An algorithm can allocate the consumption to satisfy the comfort of the user considering energy costs, emissions and comfort. An energy community, aggregator or Energy Service Company (ESCO) could provide those kind of services.

Short Facts

- Automation: energy consumers do not have to be in charge of turning on or off devices anymore.
- Consumers know what their consumption is and the status of their assets.
- Consumers will get remote control of their devices.
- Consumers will get a detailed description of energy costs and balances.
- The tool will reduce the bill of the consumer.

What do we want to achieve?

Automatize the consumption to reduce the bill and increase self consumption.

Implementation targets

- Energy Communities
- Domestic and Commercial Consumers/Prosumers

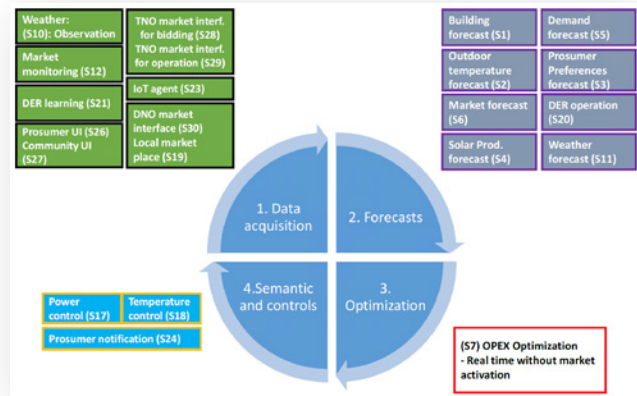
Greatest Benefit

Energy Efficiency can help to reduce the costs shifting consumption to low price periods or renewable production.

Market Potential

Being included in Energy Management System or used by aggregator, energy communities or any energy service provider.

Screenshot



Developer



Contact

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Technical Readiness Level



Demand Response tool

The Demand Response (DR) tool helps to manage energy resources based on the market needs (explicit DR). The tool will interact with markets to offer flexibility services. Increasing or decreasing consumptions levels can benefit the electric network to avoid balance or congestion issues. It enables computing key indicators, such as participation in markets, amount of flexible energy, and incomes of DR. An interface with DSOs and TSOs will allow for better coordination to manage the flexibility measures.

The DR tool relies on the Energy Efficiency (EE) tool. This means that the actions to modify the consumptions are done with respect to the operation decided by the EE tool. The DR tool could typically be used for the business of aggregators, but also energy retailers that provide DR aggregation services.

Short Facts

- Automation: energy consumers do not have to be in charge of turning on or off devices anymore.
- The tool will reduce the bill of the consumer and might lead to extra revenues from explicit demand response actions.
- The provider of this tool can monetize these savings depending on the business model, receiving a monthly fee.

What do we want to achieve?

Automatize the consumption to reduce the bill and increase self consumption helping the grid.

Implementation targets

- Energy Communities
- Domestic and Commercial Consumers/Prosumers

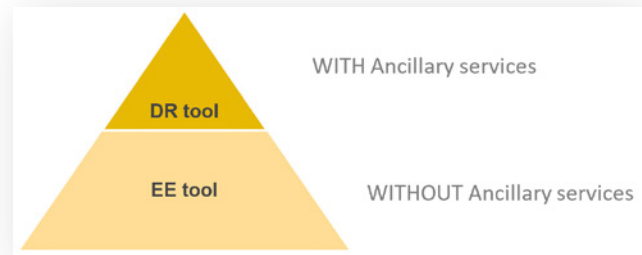
Greatest Benefit

Flexibility of the consumption is required to obtain 100% renewable systems.

Market Potential

Being included in EMS or used by aggregator, energy communities or any energy service provider.

Screenshot



Developer



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Technical Readiness Level



Advisory tool

Supports prosumers' decisions on energy consumption by predicting their energy behaviours and giving them specific consumption profiles and advice to modify their consumption patterns. The tool helps consumers making manual interventions in the use of the energy equipment and suggestions on investments to be more cost-effective. The Advisory tools could typically be used by ESCOs for their business.

Short Facts

- Increase user awareness and engagement in energy strategies to fasten economic evaluation of energy choices.
- Increase customer satisfaction verifying their contributions to encourage a CO2 emission decrease and profit increase.
- Unique advisory solution taking into account weather, tariff and user behaviour.

What do we want to achieve?

The main goal of the tool is to trigger behaviour patterns modification at user level on resources that cannot be managed automatically (e.g. they cannot be controlled intelligently or are not being profitable).

Implementation targets

- Energy Communities
- Domestic and Commercial Consumers/Prosumers

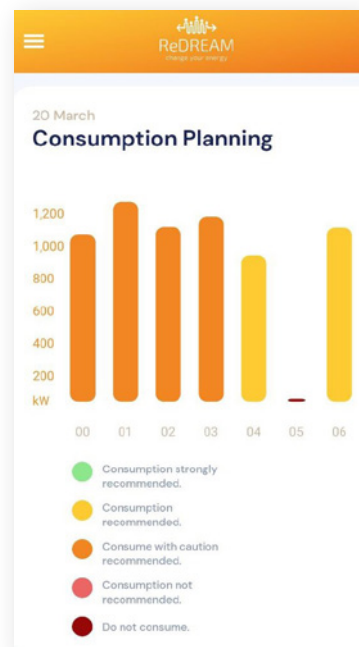
Greatest Benefit

Recommendations about how to improve your energy consumption.

Market Potential

Being included in Energy Management System or used by aggregator, energy communities or any energy service provider.

Screenshot



Developer



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Technical Readiness Level



Energy Interaction tools

A single app to learn about the energy to involve energy consumers with their energy usage.

Gamification tools: provides feedback on daily consumption taken from single appliances and tasks, using commercial smart plugs. Data is collected with the aim of providing feedback (and a scoring) on how good they have performed according to economic (tariffs), environmental (type of production available in that moment) and social (helping the balance of the local community) parameters. For example, the tool will provide feedback on the best tariffs when to put consumption patterns by providing feedback on each single action. So, repeating in a different time will show to people the actual economic saving. As users are not entirely aware of what it means to be part of the (flex) energy market and why the time of their consumption matters, this is a way to experience that practically, by getting immediate feedback on their actions.

Energy social network software: providing an environment that bounds together users and their energy data in an easy-to-share performance environment, also involving 3D or similar interfaces, that help to visualize the “community” aspect of energy distributed consumption and production. Sharing advices with the community increase the engagement of users.

Short Facts

- Improved participation of consumers in the energy transition. They will have the tools to know how they collaboratively can reduce CO₂, and help the electricity system, and they will be aware about how they behave in consuming energy.
- Open Application Programming Interface of a Commercial Smart Plug, so fostering the Data Interoperability in the energy market.
- This tool is a good “first engagement” tool to raise interest & awareness and engage the general public in the topics such as the advanced energy market linked to renewables, especially if linked to a simulation of “how it would be” to join an energy community.
- This tool can motivate institutions to understand and use the power of data in determining policies and the power of collecting data from their subsidiary companies or directly from citizens, through projects of citizen science and structured gamifications.
- Thanks to optimised energy consumption patterns through the gamification tool, there will be saving in CO₂ emissions.

What do we want to achieve?

- 1) Increase general energy knowledge of energy consumers.
- 2) Generate practical awareness of the concept of flexibility: “when you consume matters”.
- 3) Increase awareness of users on impact of different devices.

Implementation targets

- Energy Communities
- Domestic and Commercial Consumers/Prosumers

Greatest Benefit

Increase the energy knowledge of clients related to the “dynamic” aspect of renewables, therefore stimulating them in getting interested in the evolutions of the energy market.

Market Potential

The gamification module can be included in larger packages (e.g. as part of providing other services as well).

Developer

RIMOND 

Contact

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Technical Readiness Level



Mobility tool

Web-based service that is computing and providing energy and cost indicators related to the mobility behavior of the users.

Short Facts

- Compute and provide energy-related indicators based on the mobility behavior of the users.
- Links mobility behaviors to energy consumption.

What do we want to achieve?

Understand the impact of mobility behaviour on the energy profile of the user.

Implementation targets

Software developers of smart phone applications or web-based applications.

Greatest Benefit

Increase the energy knowledge of service users related to the “mobility behavior”.

Market Potential

Being included in larger mapping applications, or applications that need to obtain mobility indicators for individual persons.

Developer



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Technical Readiness Level



Comfort tool

This tool addresses the correlation between building energy consumption and thermal comfort conditions for various user habits. It outlines conditions in which a significant fraction of the occupants will find the environment thermally acceptable.

Short Facts

- Increase efficiency in energy usage for heating and cooling.
- An adjunct tool to the prevention of conditions that may be detrimental to the health of occupants (e.g. thermal stress).
- Thermal comfort is strongly correlated with health, well-being and productivity contributing to the overall human satisfaction in indoor spaces. It prevents people from the sick building syndrome symptoms caused by a thermally discomfort environment, which will probably trigger health issues and decrease productivity.

What do we want to achieve?

The main purpose is to specify the combination of indoor thermal environmental factors (air temperature, thermal radiation, humidity, air speed) and personal factors (activity, clothing insulation) that will produce thermal environmental conditions acceptable to most of the occupants within the space.

Implementation targets

The comfort service can be implemented as an interface/digital platform in specific products such as split Airconditioning units, heat pumps and dehumidifiers.

Users: Consumers, Energy communities, Building facility managers, R&D institutes, and academia.

Greatest Benefit

The tool is useful to evaluate whether or not the comfort level of the user is not compromised during the process of optimisation of the operation of the Heating, Ventilation, or Airconditioning system tailored to the end-users' behaviour. Thermal comfort is a state of mind that expresses the satisfaction with the thermal environment and there are large variations from person to person.

Developer



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Technical Readiness Level



Virtualisation solution for community solar

Energy communities that collectively own assets (e.g. solar plant) benefit in this solution from savings that result from trading energy within the community without an intermediary, which saves paying fees and levies. With the app users will be able to know their solar generation in real time and also consult historical data. Users can get advantage of the energy from the sun by participating in a solar self-consumption project in their energy community.

Short Facts

- Consumers/prosumers benefit, together with other members of their community from reductions in their energy bill with the joint installation of photovoltaic panels.
- Participants get a virtual Photovoltaic panel (avoiding installation issues).
- Participants will reduce their tariff and consume green energy.

What do we want to achieve?

Increase renewable consumption in local areas and reduce energy cost of users.

Implementation targets

- Energy Communities
- Domestic and Commercial Consumers/Prosumers

Greatest Benefit

Easy to understand and enroll users. Virtual panels are easy to integrate, just one installation needed. Avoid installation of individual Photovoltaic panels (installers, licenses...).

Market Potential

Being included in Energy Management System or used by aggregator, energy communities or any energy service provider.

Developer



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Technical Readiness Level



Virtualisation solution for Peer to Peer (P2P)

This solution includes a Peer to Peer (P2P) plan within an energy community to synchronise consumption with local renewable energy production. Users can get advantage of the energy generated by their neighbour. Apply for this Plan to benefit, selling/buying the surpluses to your neighbour.

Short Facts

- Sellers will ideally receive a higher remuneration for the produced energy when they sell it to other consumers in the energy community. They will sell their surpluses to local users, and reduce the Return of Investment (ROI) of the solar investment.
- Buyers will have cheaper access to energy than buying directly from the supplier. Buyers: Get a Virtual Photovoltaic panel avoiding installation issues, reduce your tariff, consume green energy.

What do we want to achieve?

Increase renewable consumption in local areas and reduce energy cost of users.

Implementation targets

- Energy Communities
- Domestic and Commercial Consumers/Prosumers

Greatest Benefit

Easy to understand. Virtual panels are easy to integrate, just one installation needed.

Market Potential

Being included in Energy Management System or used by aggregator, energy communities or any energy service provider.

Developer



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