ENERGY **COMMUNITIES** REPOSITORY

DIGITAL TOOLS FOR ENERGY COMMUNITIES

A SHORT GUIDE

Contents

Introduction

The decentralized and distributed nature of renewable energy resources requires the use of digital solutions in order to better manage our electricity consumption, balance distributed supply with demand and make optimal use of existing grid infrastructure. At the same time, the management of energy communities – which often operate like small or medium-sized companies – requires IT infrastructure for their management and operations.

These developments are also recognized in the European Green Deal and REPowerEU, both of which require a deep digital and sustainable transformation of our energy system. These plans are complemented by the Digital Decade Policy Programme 2030 for Europe, as well as the Global Gateway Strategy.

The EU Action Plan for Digitalising the Energy System further describes the importance of digital tools to enable consumers to connect and collectively scale up their potential interactions with the electricity system. For example, such schemes could allow a community to:

○ better monitor how the community is performing in terms of energy consumption, or

○ share solar panels or otherwise engage in energy sharing or peer-to-peer trading of electricity produced from joint investment projects that can make them less dependent on high electricity prices set in the wholesale market.

The Commission seeks to enhance and promote the sharing of knowledge on existing digital tools, with programs tailored to the needs of different demographic groups.

With this in mind, the purpose of this document is to identify and shortlist practical examples of digital solutions for energy communities in different scopes of application. This guide does not aim to be exhaustive, nor does it represent a qualitative evaluation or endorsement of the solutions presented. It merely aims at illustrating different categories of digital solutions which respond to some of the needs and challenges expressed by energy communities to the Energy Communities Repository.

Digital tools for internal management & communications

Digital tools are key for managing the internal processes, relationships with customers/members, and communications operations of any company – energy communities are no different in this regard. A number of EU-funded projects have already investigated and compiled tools used by energy communities for these purposes.

The guides below feature a collection of digital tools for the internal, communications and IT management of energy communities.

The Participation Toolkit: Digital tools

This guide developed by the gE.CO Living Lab project identifies open source solutions and easy-to-use proprietary software built by communities for communities. It includes tools for online communications, project management and planning, as well as online courses and utility software for energy communities.

IT- and communication tools for energy communities

The SCCALE203050 project developed an overview of tools based on interviews conducted with 15 energy communities in the EU. The guide contains tools for internal organization, external communication, and overall engagement.

Internal management: Som Comunitats, Spain

Som Comunitats is an online platform offering internal management services to energy communities. The platform is currently being co-developed by a number of energy communities in Spain.
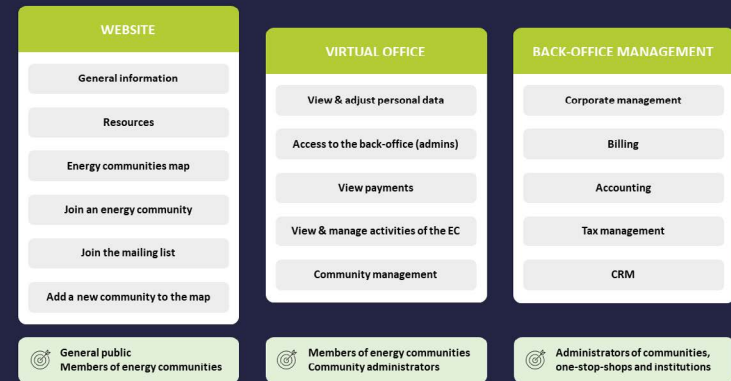
HOW DOES IT WORK?

The platform offers a wide range of services for energy communities to manage their activities from one single platform. This includes data visualisation for individual users, project management tools, as well as an internal platform for the management of members and other administrative tasks related to the energy community. All these tools can be adapted by the respective communities to match their needs, and can be integrated into their respective websites.

In addition, Som Comunitats is working on developing solutions for one-stop-shops and organizations that support the set-up of energy communities.

The co-development and decision-making process of this platform is managed in a collaborative and transparent manner among all participants. In order to keep data ownership within the energy communities, the platform ownership lies with its members.

*Visual: Structure of the Som Comunitats platform*

WEBSITE
General information
Resources
Energy communities map
Join an energy community
Join the mailing list
Add a new community to the map

General public
Members of energy communities

VIRTUAL OFFICE
View & adjust personal data
Access to the back-office (admins)
View payments
View & manage activities of the EC
Community management

Members of energy communities
Community administrators

BACK-OFFICE MANAGEMENT
Corporate management
Billing
Accounting
Tax management
CRM

Administrators of communities, one-stop-shops and institutions

WHO IS IT FOR?

The tool is designed for citizens, public administrations, as well as companies and entities who are part of the social economy.

Digital tools for operations

Peer-to-peer trading: Alliander, Netherlands

In response to the energy crisis and supported by a subsidy from the Dutch government, Dutch energy communities are working on developing tools to supply their members with affordable (cost-plus), locally produced renewable electricity. This is taking place under the Local4Local project, which is joined by ENTRNCE, a subsidiary of Dutch network company Alliander. Over the past years, Alliander has developed the ENTRNCE Trader, **a tool which enables producers and consumers to directly exchange electricity with each other.**
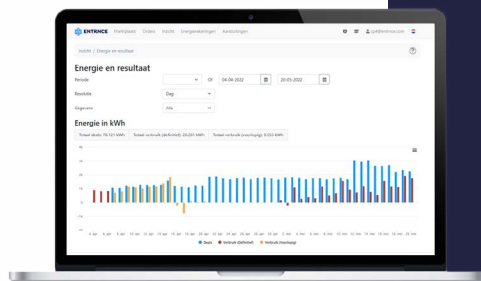
Credits: ENTRNCE

⚙ HOW DOES IT WORK?

ENTRNCE's objective is to enable or achieve the following objectives and specifications:

- Help producers and consumers directly exchange electricity with each other to facilitate the consumption of locally produced electricity

- Increase freedom of choice for users by facilitating every possible electricity transaction possible at the lowest granularity available in the market

- Function within the current market design and processes by cooperating with the market parties involved (suppliers and balance responsible parties)

- Establish the financial settlement of traded electricity volumes and imbalance costs and benefits on an individual basis (EAN)

- Provide full transparency with regards to insights into the realised electricity flows processed as well as the financial costs and benefits that come with trading directly with others.

Credits: ENTRNCE

To maximise the impact of the Local4Local movement, ENTRNCE Trader will soon include an additional energy community layer. This will allow energy communities to balance surpluses and shortages of affordable, locally produced electricity with their members as well as with other energy communities before exchanging with the wholesale market.

⚇ WHO IS IT FOR?

Energy communities planning to engage – or already engaging – in supply of self-generated electricity to their consumer members.

Credits: Magliano Alpi

Energy forecasting: Magliano Alpi, Italy

As part of the EU-funded ERIGRID project, the city of Magliano Alpi, in collaboration with the European Union's Joint Research Center (the 'JRC'), developed a tool that will help energy communities match their energy needs with their production potential.

⚙ HOW DOES IT WORK?

The purpose of the tool is to forecast the aggregated energy needs and self-consumption volumes of an energy community, as well as its production potential. The tool takes into consideration seasonal trends, weather conditions, number and type of prosumers, number and type of consumers and the geographical spread.

The tool will further support the formulation of business plans for Renewable Energy Communities (RECs), estimating the financial incentives for RECs within a country.

The tool can be used to evaluate specific scenarios (i.e. RECs with types and numbers of consumers that are already well defined), or to carry out sensitivity studies to estimate the possible output and consumption patterns of an energy community and its members.
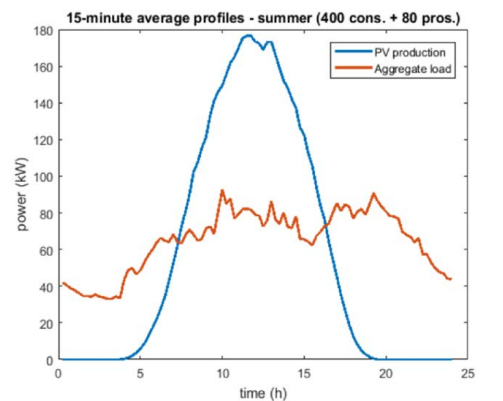
Credits: Magliano Alpi

👤 WHO IS IT FOR?

The ERIGRID project has been extended – this will allow Magliano Alpi and the JRC to upgrade the forecasting tool. The consortium is planning to launch an open source version of the tool in 2023, which will be developed so that energy communities in the whole EU can use it for their activities.

Energy monitoring: EnergyID, Belgium / Italy / France / Portugal / Netherlands

EnergyID helps energy communities and individual consumers collect, analyse and compare their energy, water, waste and transport data – individually and collectively.

⚙ HOW DOES IT WORK?

EnergyID processes users' data into simple graphs to help them understand their consumption patterns and how much they are currently saving. Through a benchmark module, users can quickly compare themselves with similar users. A timeline helps users keep track of all investments and actions they performed. The tool further allows for integration with a growing number of PV inverters and smart metering systems.

Users can share their data with the communities (groups) of their choice. Energy community managers can support users in different ways. EnergyID provides extensive data reporting on the community. Community members get access to premium features like measurement and verification, a custom dashboard, in-depth analytics and more.
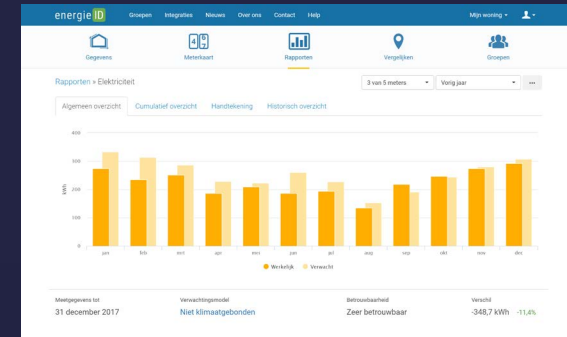
Credits: EnergyID

🖥 WHO IS IT FOR?

Individual consumers as well as energy communities. The communities offer energy monitoring to their members and can support them where needed. EnergyID enables communities to include community-owned PV or wind production in the mix. It offers aggregated data-insights to improve collective self-consumption and self-sufficiency as well as to investigate options for energy sharing (in development).

Demand-response / flexibility services: PowerShaper, UK

PowerShaper is a service that enables people to turn their electrical appliances on and off remotely. The tool helps people save money (for instance by turning on certain devices when energy is cheaper), and supports the flexible operation of the electricity grid needed for renewable resources. The tool is operated by Carbon-Coop in the UK.

HOW DOES IT WORK?

PowerShaper can be used for controlling the energy use/operation of electric vehicles, battery units, solar inverters and immersion heaters. The installation is provided for free. The user does not need to change supplier, and electric appliances will not be turned off by the service provider without prior consent of the consumer.

Home visit

Technicians from the community visit a member's home and install equipment which will enable certain existing electrical appliances (such as electric vehicle chargers, immersion water heaters, battery storage) to be turned on/off remotely. They further show their members how to use their new equipment to set up smart automations in their home.

Automation

The energy community turns appliances on/off only when they receive a request from grid operators and other parties. These actors will pay the energy community if they can prove that appliances were turned on/off in the right places at the right times. Part of the payment for providing this flexibility is then passed on to the community's members participating in the programme.

Data

The community uses the data from the smart meter installed by the members' electricity supplier to prove the balancing activities carried out by the community (only the data at the time the community had been requested to turn appliances on/off). The community access this data automatically from the national smart metering system. The members don't need to provide any bills or other documents.

WHO IS IT FOR?

Individual consumers, including consumer members of an energy community.

Software platform for energy communities: MARS, Croatia

Photo credits: KONCAR

The MARS software platform helps energy communities collect, calculate, and analyse data on energy production and consumption, both at household and at community level, thus enabling users to make informed decisions at the right time.

HOW DOES IT WORK?

The MARS software platform uses the Internet of Things (IoT) to automatically collect and integrate data from smart meters and advanced sensors. It supports a wide range of devices such as solar panel inverters, energy meters, sensors and others. Real-time data on energy consumption and production from solar panels installed on private homes and public buildings is verified and validated, stored, calculated, analyzed, and displayed in a way that makes it easy to understand. The platform also provides real-time reports & alarms, that can be customized in line with the users' needs & preferences. The MARS platform supports smart city software solutions. It can be used to develop and manage new smart city services including energy efficiency management, smart public lighting, parking and e-mobility and other applications. This robust and reliable platform can be easily adopted and integrated with existing systems and new services.

WHO IS IT FOR?

The system is used by energy communities and renewable power plant operators. It is also used by energy managers and city administrations to manage energy efficiency and smart city services.

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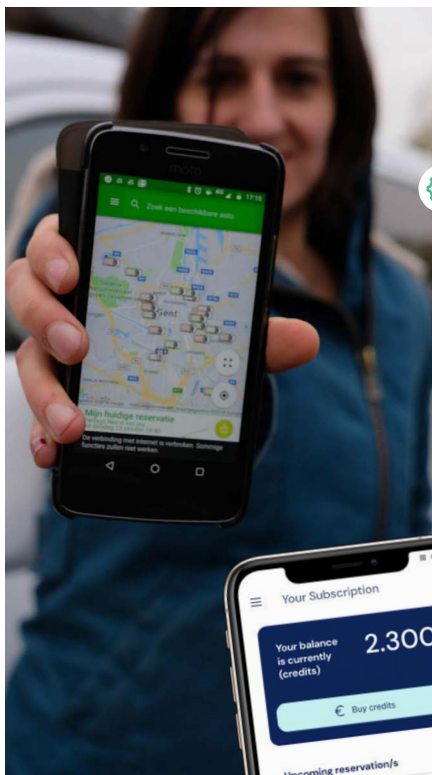# Clean mobility: The Mobility Factory, EU

Photo credits: The Mobility Factory

The Mobility Factory (TMF) is a European cooperative that provides a platform for energy communities engaging in e-carsharing services.

HOW DOES IT WORK?

The platform works just like a regular car-sharing application, with one difference: the IT platform is owned by a European cooperative, co-developed and governed by the TMF members and exclusively used by its members. This way, the participating energy communities retain ownership of the platform, and control the privacy and data management processes. The modular platform is tailored to local communities' needs, focusing on automating processes like onboarding, user-group management, reservations, physical access to cars and bicycles, and pricing and integrating with different payment solutions.
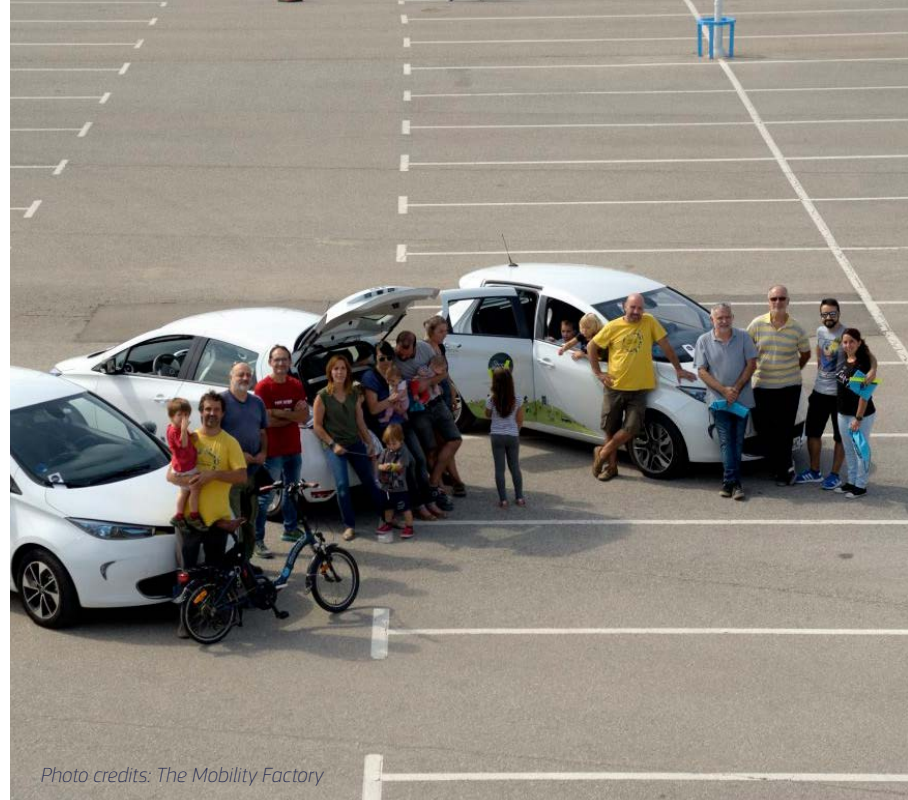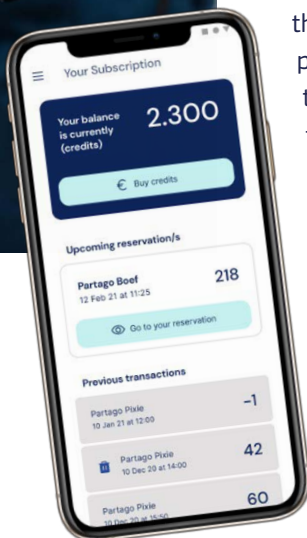

Photo credits: The Mobility Factory

WHO IS IT FOR?

Energy cooperatives can join The Mobility Factory to access the platform, and members with IT skills and an interest to contribute to developing the platform are welcome to join the team of developers if they wish. Currently, the platform is used by more than 15 energy cooperatives in 5 EU countries.

Home renovation services: Hoomdossier, Netherlands
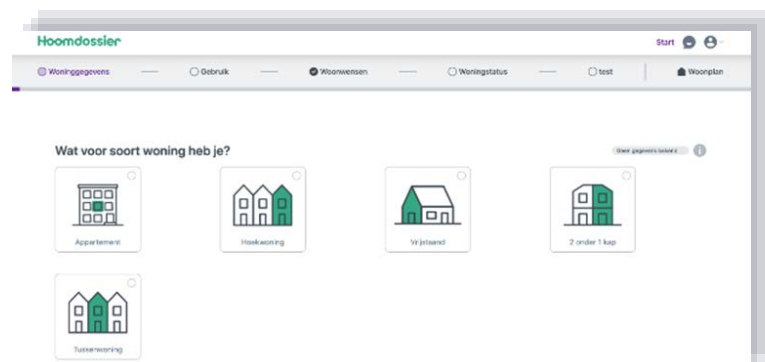
Hoomdossier website

Hoomdossier is an online reporting tool for energy communities providing home renovation services and support to their members.

⚙ HOW DOES IT WORK?

The tool allows energy coaches to set up documents outlining the energy performance and overall situation of a home. The ownership of the document and related data lies with the resident, who can complete the documents independently or with their energy coach in order to gain insights into possible measures to save energy and improve comfort. Besides the standard questions provided by the tool, there is room for comments, and for adding questions specific to the municipality the resident lives in, in order to obtain additional information. The tool also allows energy coaches to gain an overview of the most popular questions, and in which neighbourhoods the interventions have taken place. This helps improve the service offer for the residents.

⊖ WHO IS IT FOR?

Energy communities looking to offer support for home renovation services.

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List of digital tools produced by EU projects

Consumption monitoring & production forecasting tools

NOBEL GRID

The Nobel Grid project developed a web and mobile application for domestic and industrial prosumers in order to monitor, control and manage their energy consumption and production and all the metrics and indicators that will support them in order to modify their energy behaviour to reduce emissions and electricity billing.

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GAIA

The applications developed in the context of the Gaia project include a web application, called the Building Manager Application, that allows for monitoring the real energy consumption of the schools and correlate it with the school activities, allowing them to define rules and be notified when these are violated; this application is also used by the school communities to experiment with energy efficiency.

Contact: Georgios MYLONAS (mylonasg@gmail.com)

WiseGRID

WiseCOOP solution targets aggregators of consumers and prosumers, particularly focused on domestic and small businesses, supporting them in their roles of energy retailers, local communities and cooperatives. Among others, it includes net metering, demand forecasting or tariff comparison.

WiseHome App aims at individual domestic consumers and prosumers to become active energy players. Real time data coming from their distributed energy resources, respective pricing data incentives and flexibility capabilities, will be made visible to consumers, allowing them to enjoy benefits offered by optimized human-centric demand response strategies and personalized demand response contracts.

Contact: Antonio MARQUÉS (amarques.etraid@grupoetra.com)

FLEXCoop

The FLEXCoop project developed dedicated interfaces and applications for prosumers to enable efficient monitoring of real-time demand data and Demand Response events triggered by aggregators. The main features and functionalities are: energy demand monitoring and analytics, financial and economic management of contractual agreements, demand forecasts as extracted from analytics services, notifications of demand response events triggered by aggregators and verification of compliance with contracts, smart controls and automation overriding options, along with a rich analytics dashboard for increasing awareness around energy consumption and demand response (e.g. comparison with similar peers, previous periods analytics, DR convenience and strategy overriding metrics, etc.).

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MERLON

The Merlon project developed a Prosumer App for: user-friendly and secure billing services; interface for energy monitoring; analytics services for consumers and prosumers; and participation in flexibility markets. This tool provides the intelligence to target small consumers, and cope with small energy consumers that need non-intrusive systems and effortless demand-response models that can ensure high economic gains without compromising their comfort and well-being.

Contact: Antonis PAPANIKOLAOU (a.papanikolaou@hypertech.gr)

Behavioral change

ENTROPY

The Entropy project developed a set of personalised mobile and social applications targeted at providing real-time recommendations to end users based on their behavioural profiling, as well as supporting interaction with other users in their social networks. The set of applications will include characteristics regarding personalized behavioural analysis, consumption and cost efficiency motivation and information including personalized retrofit suggestions and tips with estimated cost and return on investment time, peer comparison with neighbours in terms of total and consumption of individual appliances, monthly projections of consumption and savings, energy characterisation of buildings and services and social media sharing for disseminating real-time data and achievements and sharing content with friends.

Contact: Antonio SKARMETA GOMEZ
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PEAKapp

PEAKapp is a mobile application to raise consumer awareness regarding their energy consumption and motivate households to adopt and sustain behavioural changes through different incentives including dynamic prices, social comparison and serious gaming.

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Eco-Bot

Eco-Bot is a chatbot application that monitors the energy consumption of specific appliances and sends tailor-made energy saving recommendations to its users. The main target groups are Utilities and Energy Service Companies (ESCO's). The tool seeks the active engagement of the users with the goal of improving their energy behaviour.
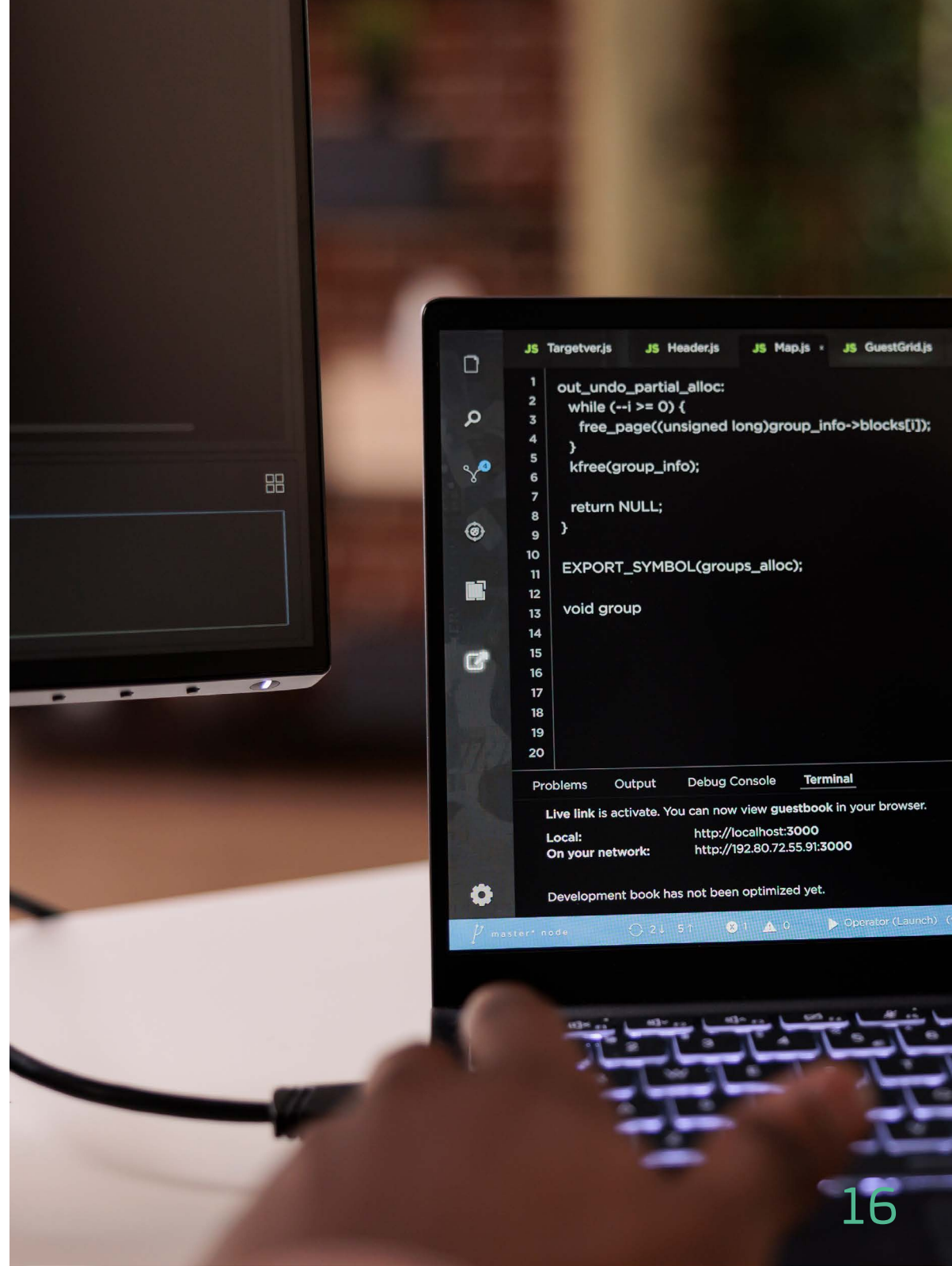
Contact: Stephanos CAMARINOPOULOS
(s.camarinopoulos@risa.de)

inBETWEEN

inBETWEEN is an ICT platform developed for the integration of advanced energy services on the one side, and monitoring/ home automation platforms on the other. inBETWEEN cloud based platform allows users to integrate their building's connected devices and systems with advance energy analytics and optimisation services to create a comprehensive recommendation and feed-back solution which will further facilitate the behaviour change towards more energy and cost efficient daily routines.

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