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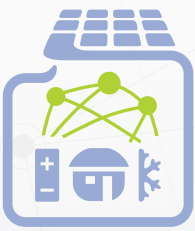
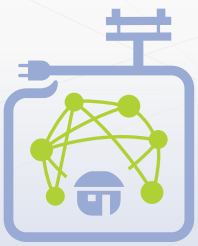
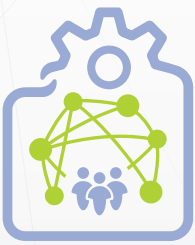
INTEGRATING COMMUNITY POWER IN ENERGY ISLANDS

COMPILE TECHNICAL TOOLS

For operating and managing energy islands and communities







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COMPILE Toolbox

GET TO KNOW THE COMPILE TECHNICAL TOOLS

The learnings from the pilot sites taking part in the project have led to the creation of toolsets that have the potential to empower other communities to take on their local energy systems with large or even entire shares of renewable energy. We are introducing you to three technical tools.

HomeRule

HomeRule is one of the COMPILE project tools that help operate energy communities, with a focus on managing one building/home energy needs. Different features that the tool encompasses bring new possibilities of management and control of various technologies and integration of RES in the congested grid that all together result in added value for end-user.

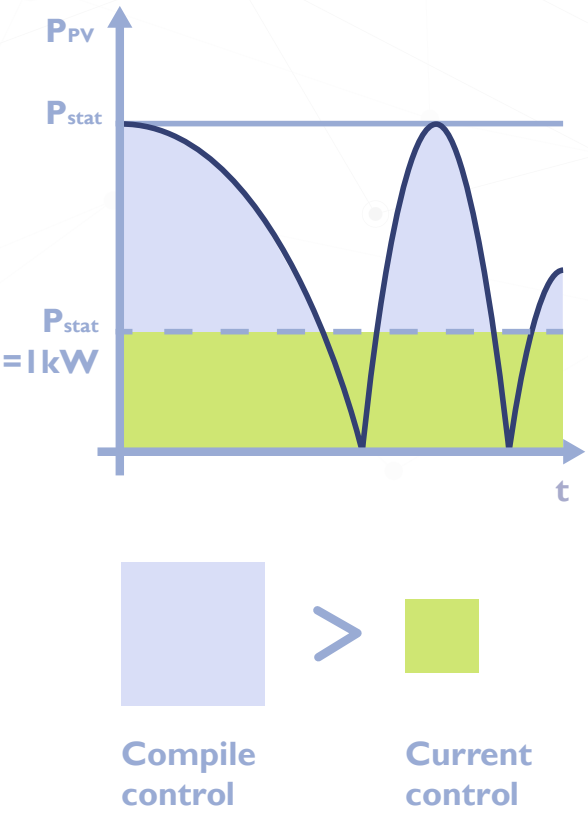
Features:

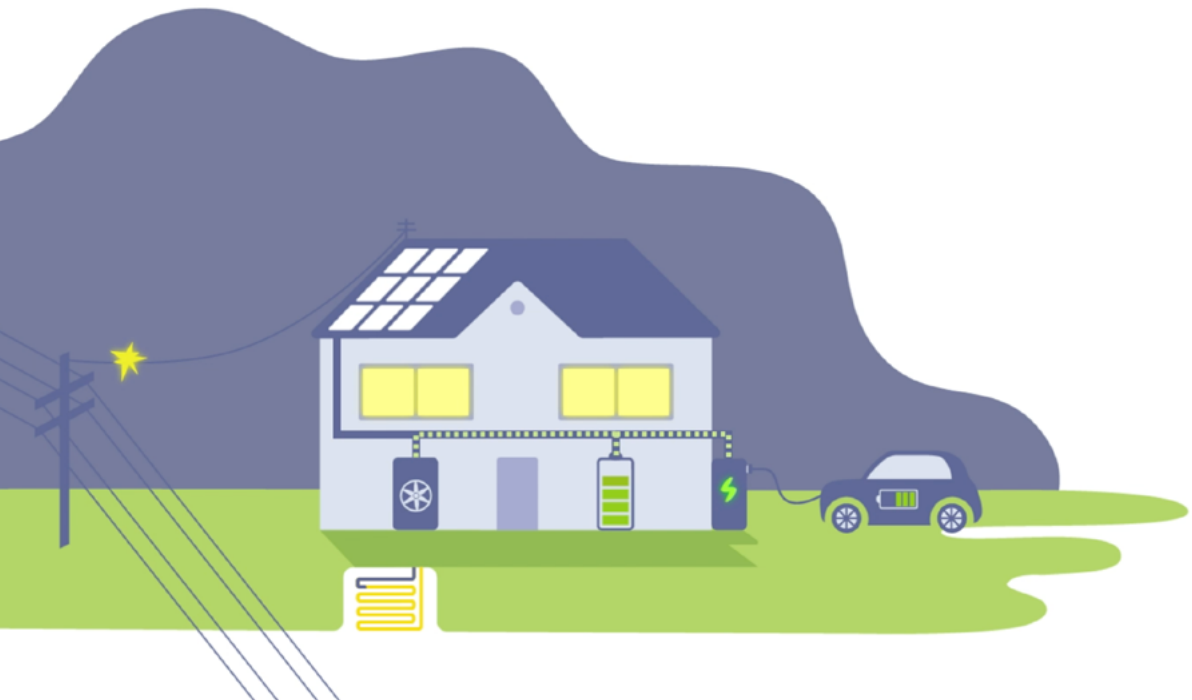
- Advanced PV curtailment
- Voltage support
- Connection to PV
- Connection to home battery
- Economic optimization
- Interoperability with other COMPILE tools
- Connection to EV charger
- Connection to SmartHome and management of energy-related devices – e.g. heat pumps
- Islanding Mode

Main results

The HomeRule tool is being developed by COMPILE partner PETROL and is the working prototype that has been implemented in pilot site Luče. With the help of HomeRule, we were able to install more PV than it was originally allowed by local DSO rules and not jeopardize the operation of the grid. The new advanced PV curtailment has already been showing a real increase of green energy injected into the grid.

In contrast to most EU DSOs' current practice of limiting PV production to a particular amount (in the Luče example, 1 kW), HomeRule limits output depending on real network conditions (voltage at the point of common coupling) and hence increases PV output. The results from the pilot site reveal that a single house's PV output climbed by 320%, while the entire community's production increased by 180% on average. In the event of a network outage, HomeRule allows individual residences with a home battery to operate off-grid by managing all energy appliances.



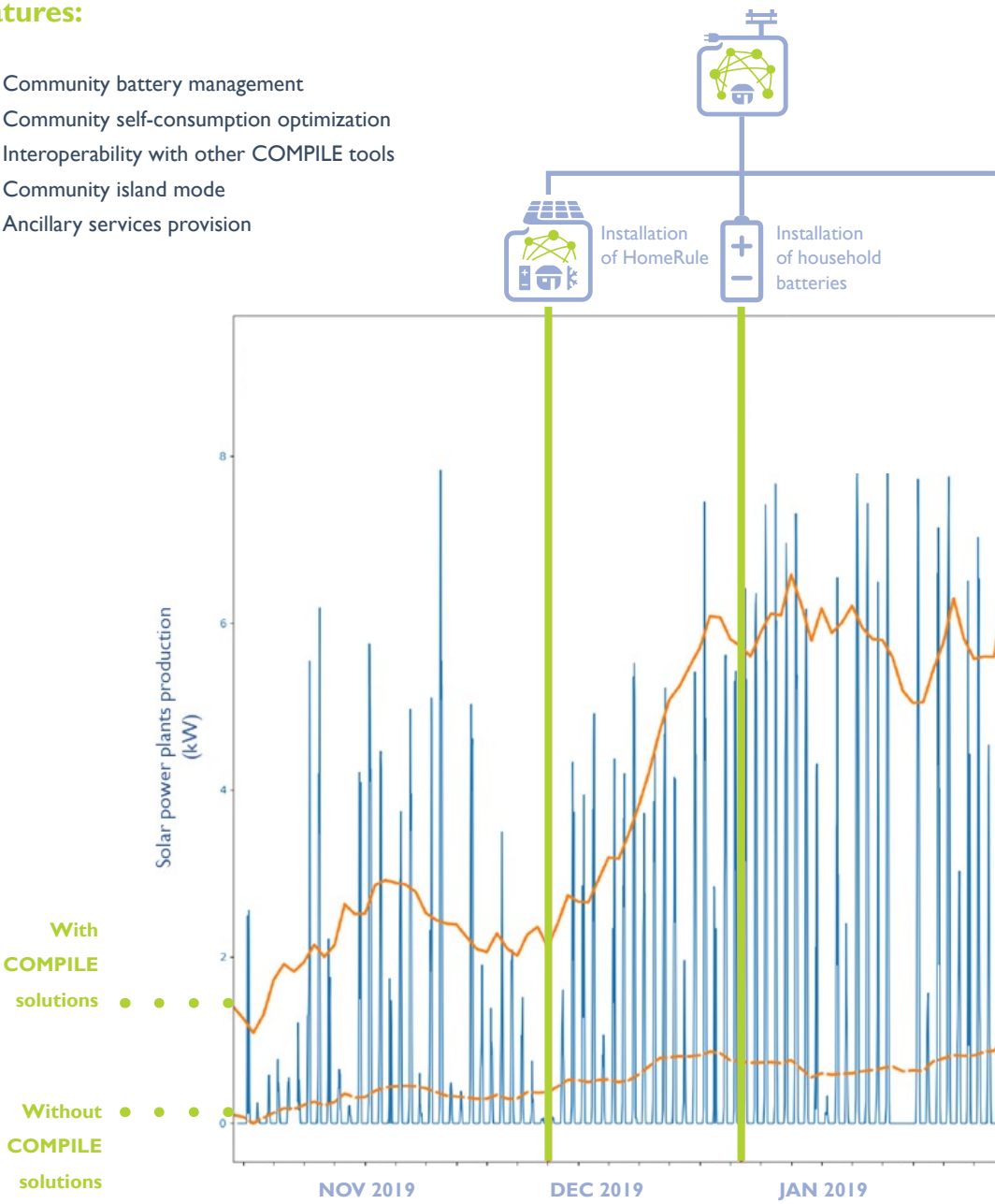


GridRule

GridRule was designed to enable the actors in an energy community to operate, manage and control the local grid within the network limits while improving their flexibility, stability and security. It sets up the coordination of individual community members and enables the optimisation of the whole community's energy needs.

Features:

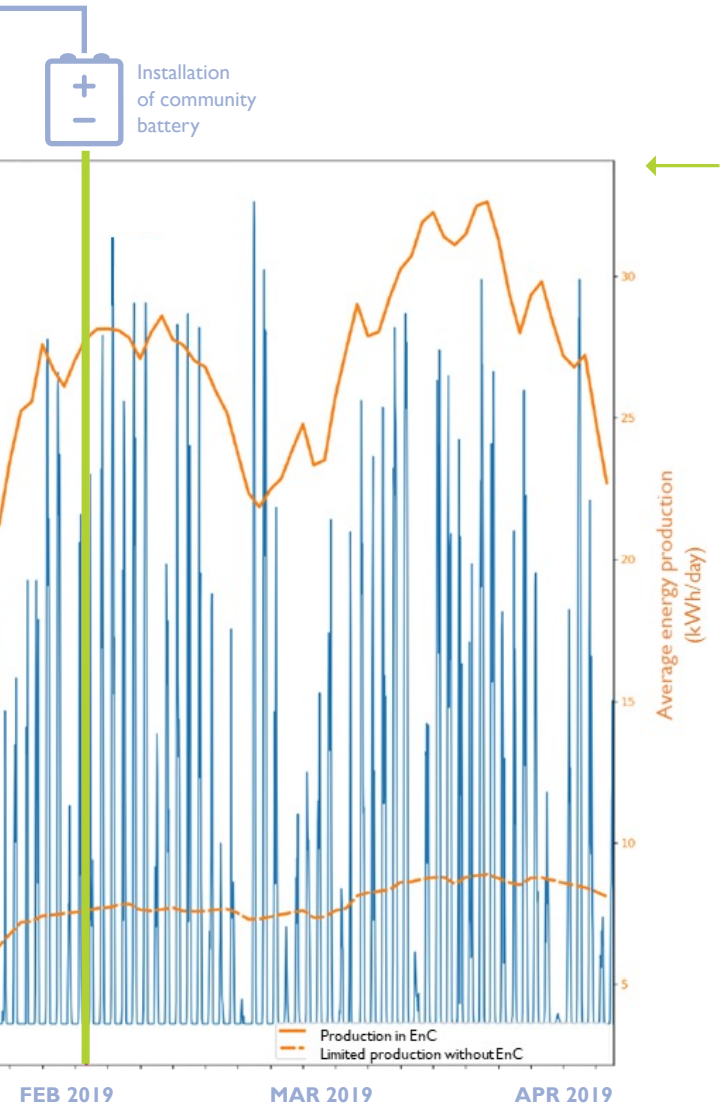
- Community battery management
- Community self-consumption optimization
- Interoperability with other COMPILE tools
- Community island mode
- Ancillary services provision



Main results

The GridRule tool is being developed in two versions, one by COMPILE partner ETRA and the other by PETROL. Both versions are tailored to an EnC operation, with different actors, needs and requirements (PETROL – commercial player, ETRA solution – self-operating EnC).

The GridRule enables data collection and presentation in a user-friendly manner, which helps the operators with their everyday work. GridRule also features various control strategies that optimize all the available flexibility in the network to maximize the benefits of the community. These features include community battery management and community self-consumption optimization. The community optimization is possible due to GridRule – HomeRule communication which enables the control of all flexible loads in the community.



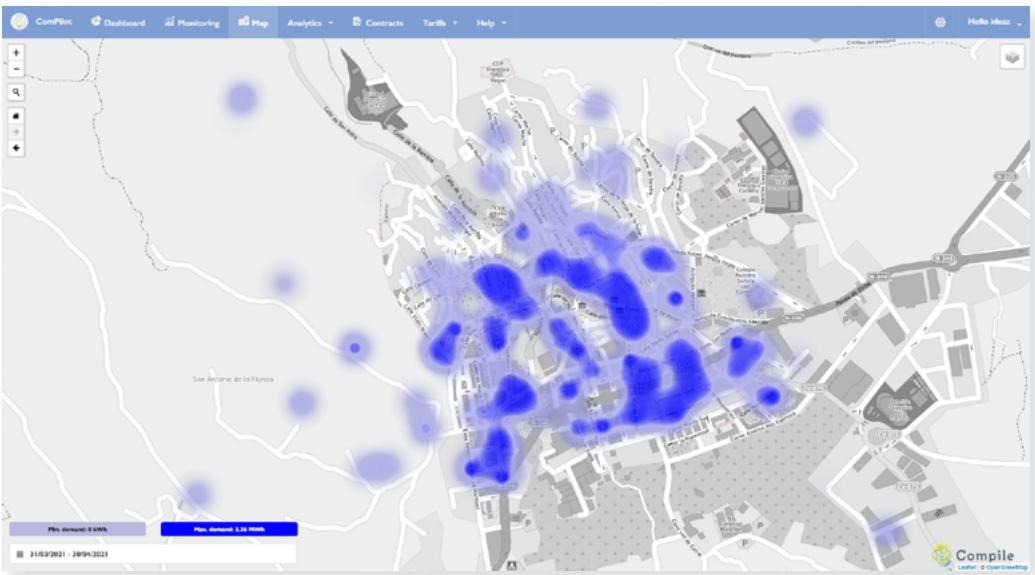
The image on the left shows the operation of PV on one of the houses in Lue EnC. The bottom dotted line depicts the PV output if there was no COMPILE, as the DSO laws limit the PV installation to 1kW. The solid yellow line presents the output of the actual installed PV of 9kW, while the three vertical lines depict the milestones – first, HomeRule installation, second, HomeBattery installation, and third, community battery installation and integration with GridRule – and we can clearly see the improvement in PV output after each upgrade.

ComPilot

ComPilot was designed as a digital platform for the management of an energy community. It benefits the network operators or community managers when learning about their energy community performance and organising cooperation agreements. With its various functionalities the tool offers user-friendly management of energy communities and shows the areas for potential improvement and further development.

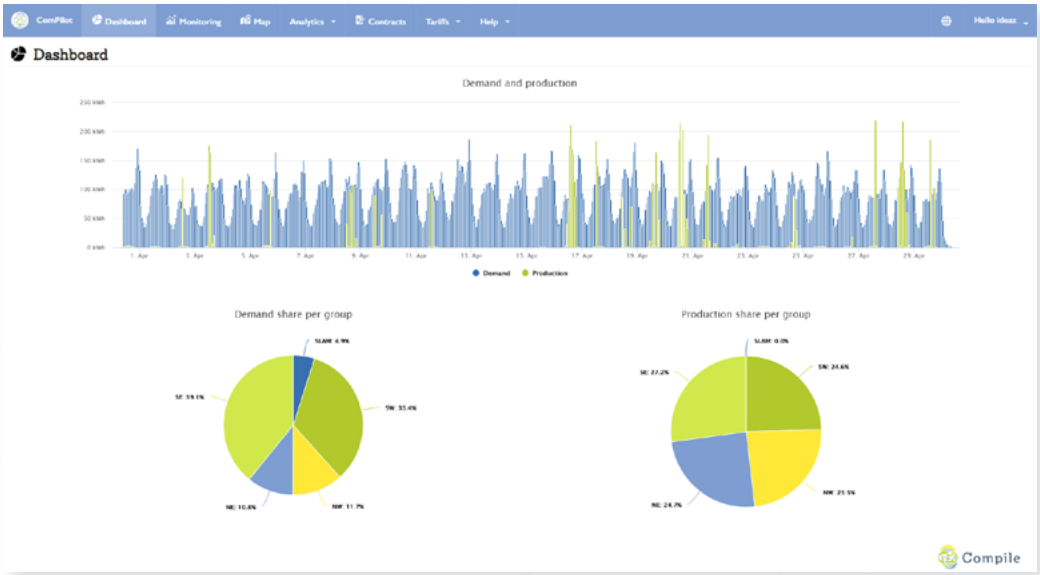
Features:

- **Dashboard:** Summary of consumption and production of the portfolio
- **Monitoring:** Drill-in data of each member of the community
- **Map:** Heat map representation of consumption and production of the portfolio
- **Analytics**
- **Group analytics:** Aggregated performance of users grouped by energy profile or custom tags
- **Individual analytics:** User performance compared to the group or cluster they are part of
- **Clusters:** Clustering of users based on their energy profile
- **Contracts:** Configuration and management of members
- **Tariffs:** Tariff definition for economic analysis of the portfolio



Main results

By using ComPilot tool network operators or community leaders monitor and manage contracts of the community in a user-friendly way.



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