REACT

Renewable Energy
for Self-Sustainable
Island Communities

REACT control loop for automated prosumer energy management in geographical islands

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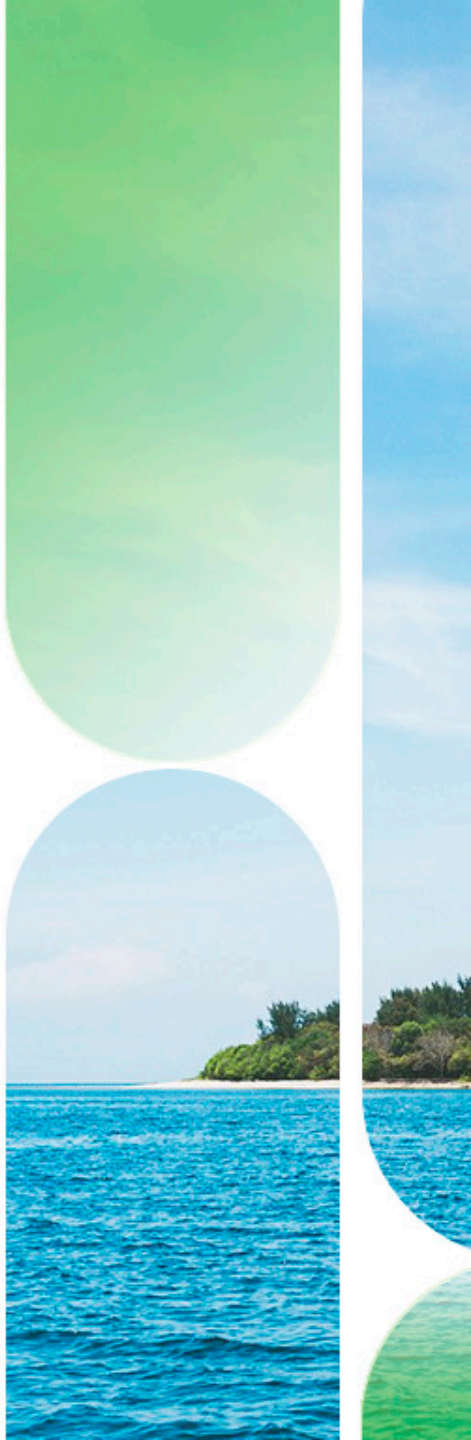
on behalf of REACT WP5 partners
Austrian Institute of Technology, Fraunhofer ISE, Tekniker, NUI Galway

Sustainable Places – September 6-9th, 2022
European Actions towards Geographical Islands

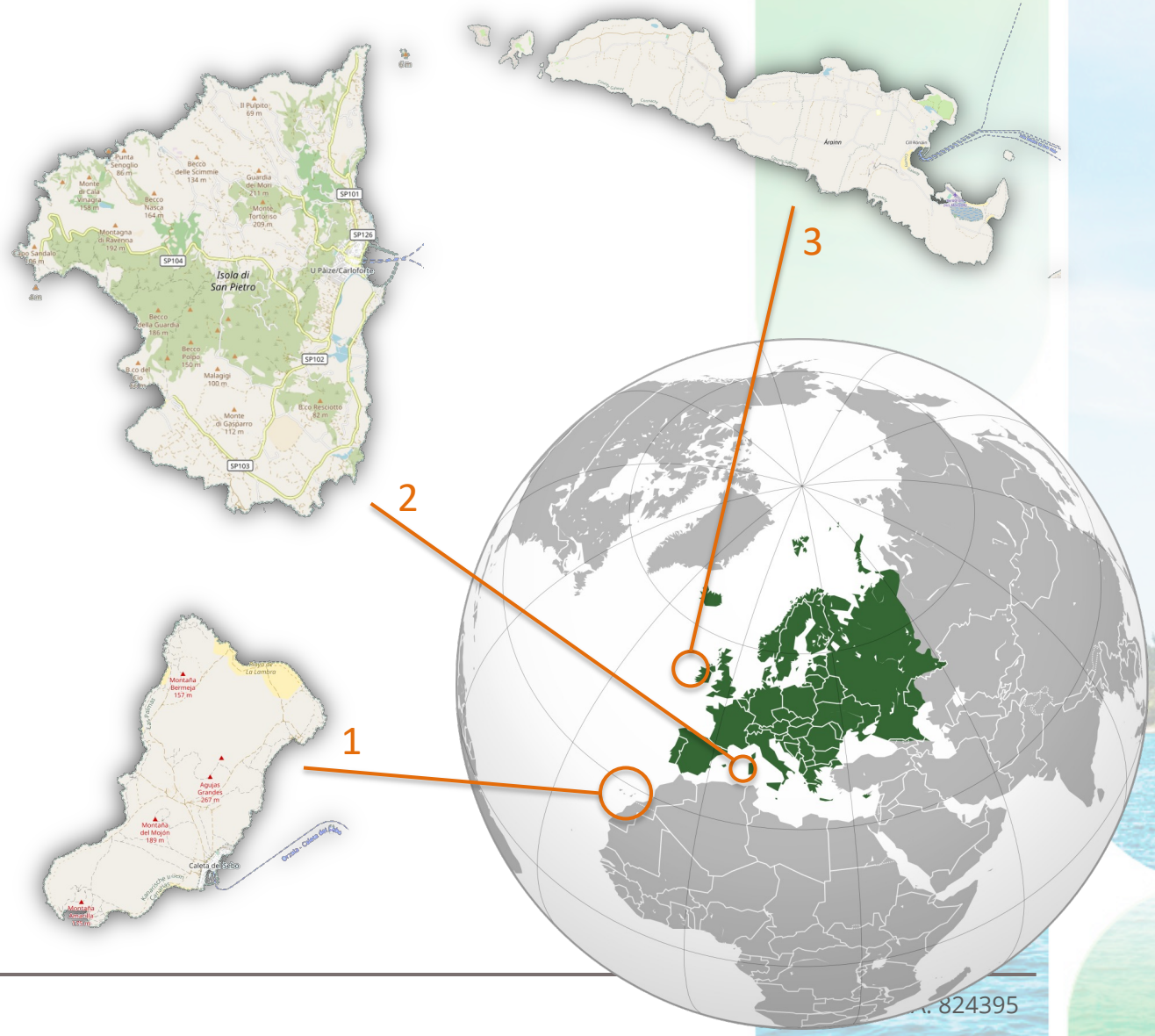


This project has received funding from the H2020 programme under Grant Agreement No. 824395

Islands of REACT

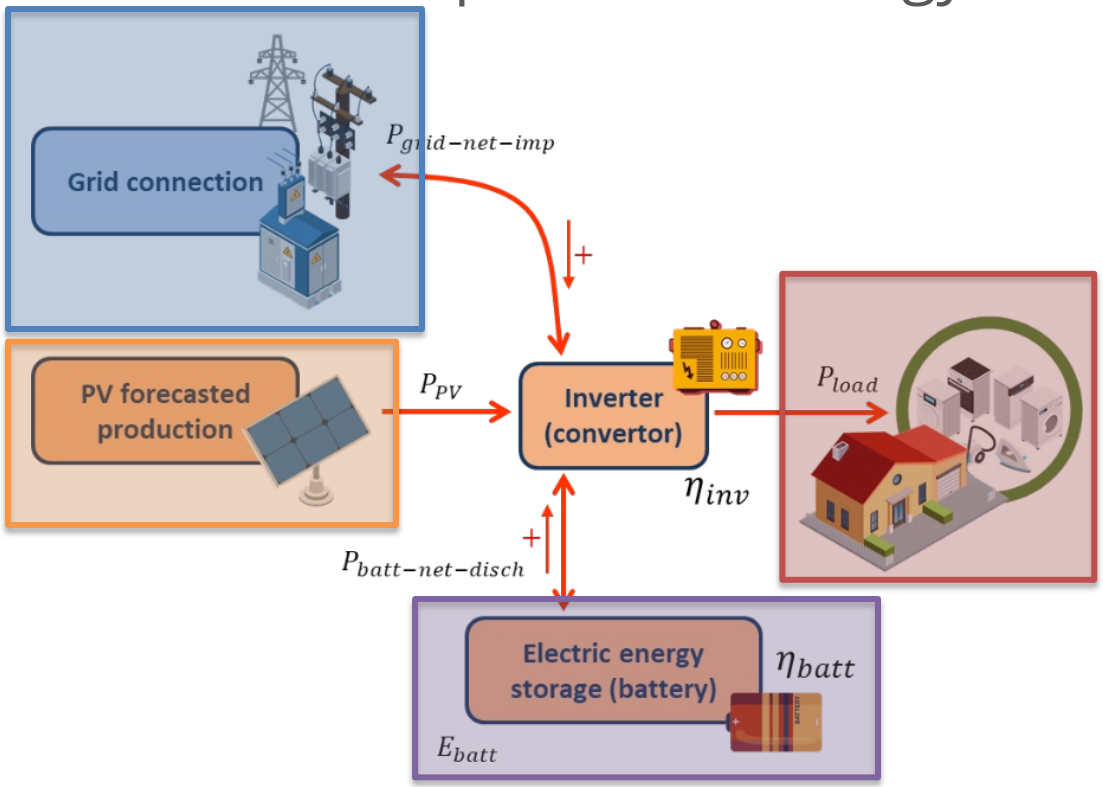
1. La Graciosa (Canary archipelago)
   13 residential + 6 commercial + 3 public
2. San Pietro (Italy/Sardinia)
   16 residential + 1 commercial + 9 public
3. Inis Mór (Aran Islands)
   16 residential + 2 commercial + 4 public

- Follower (replication) islands
  - Gotland
  - Lesvos
  - Isle of Wight
  - Majorca
  - Réunion

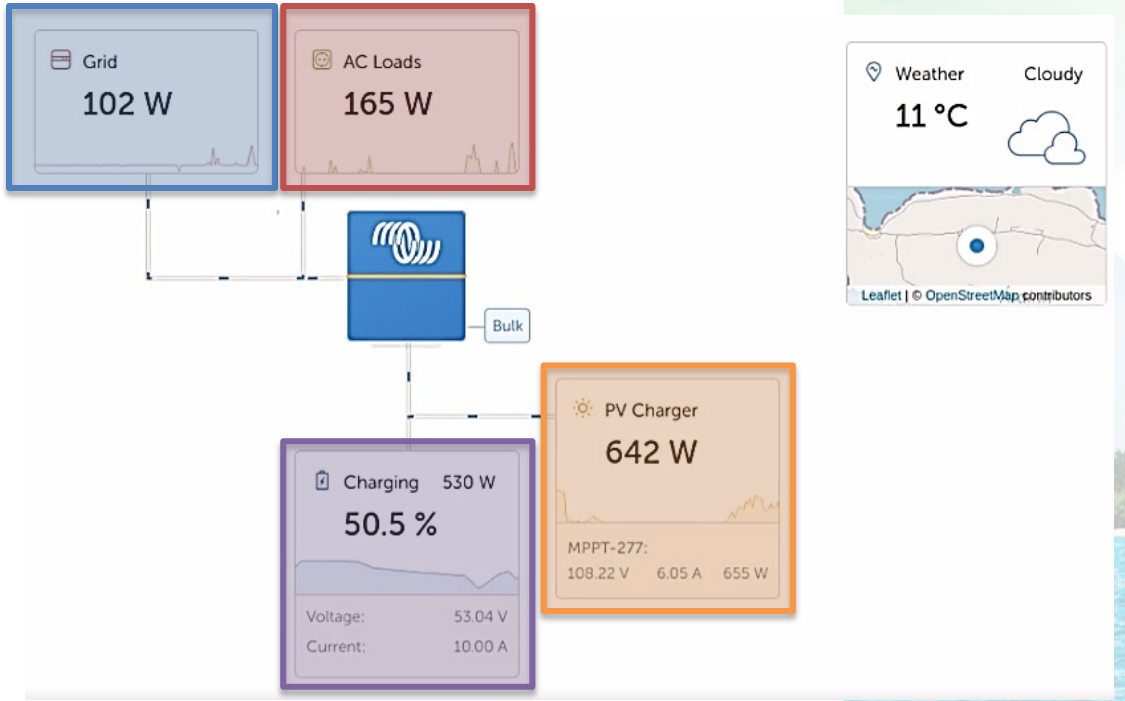


Prosumer energy management

- Individual prosumer energy models

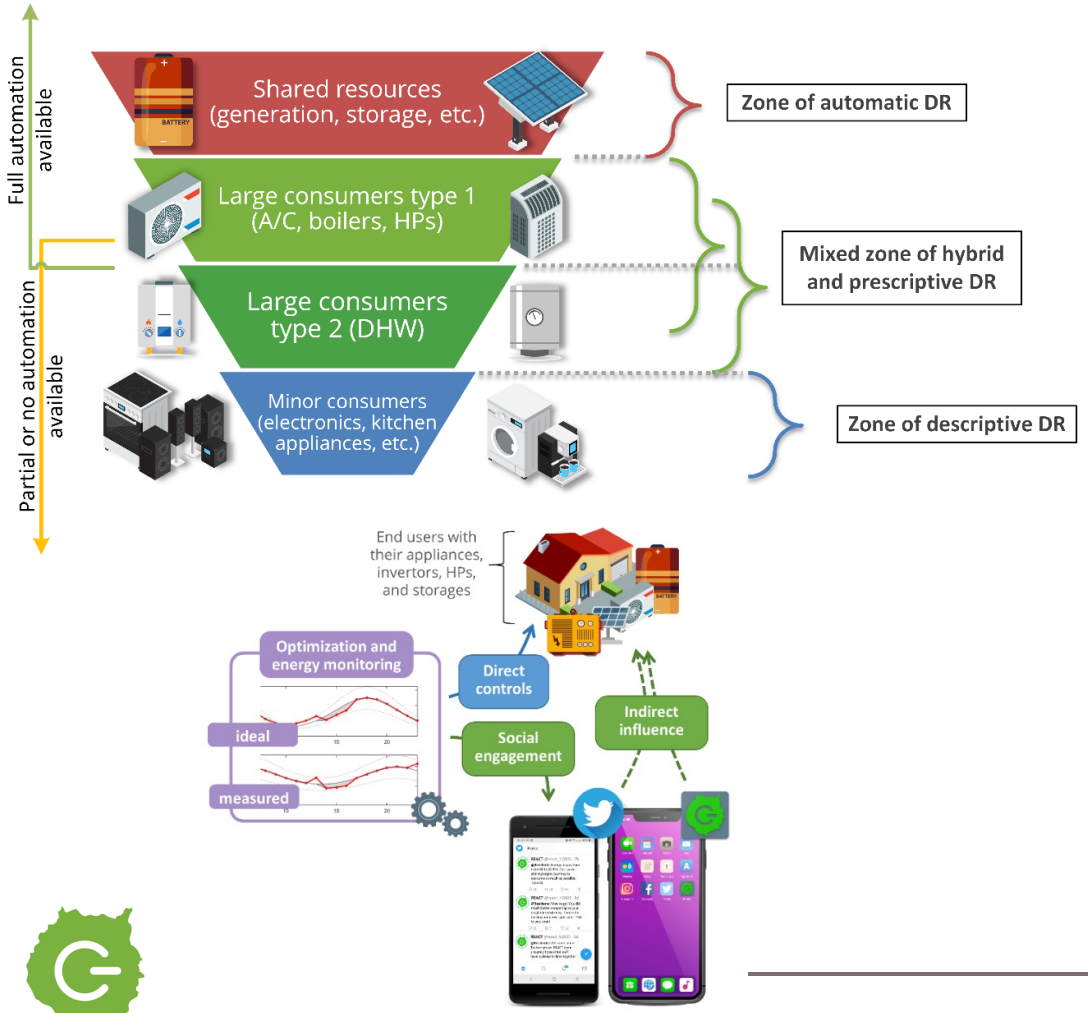


- Energy dashboard overview (Victron)

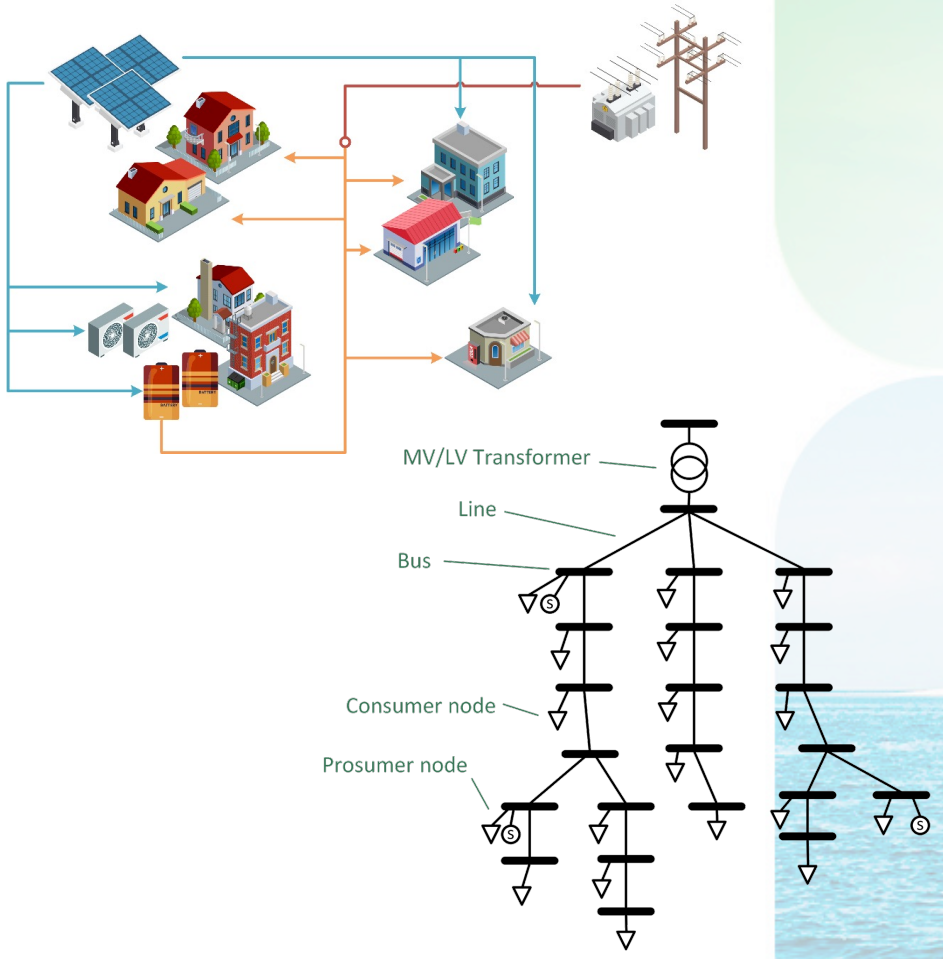


Prosumer energy management

- Multi-level DR approach

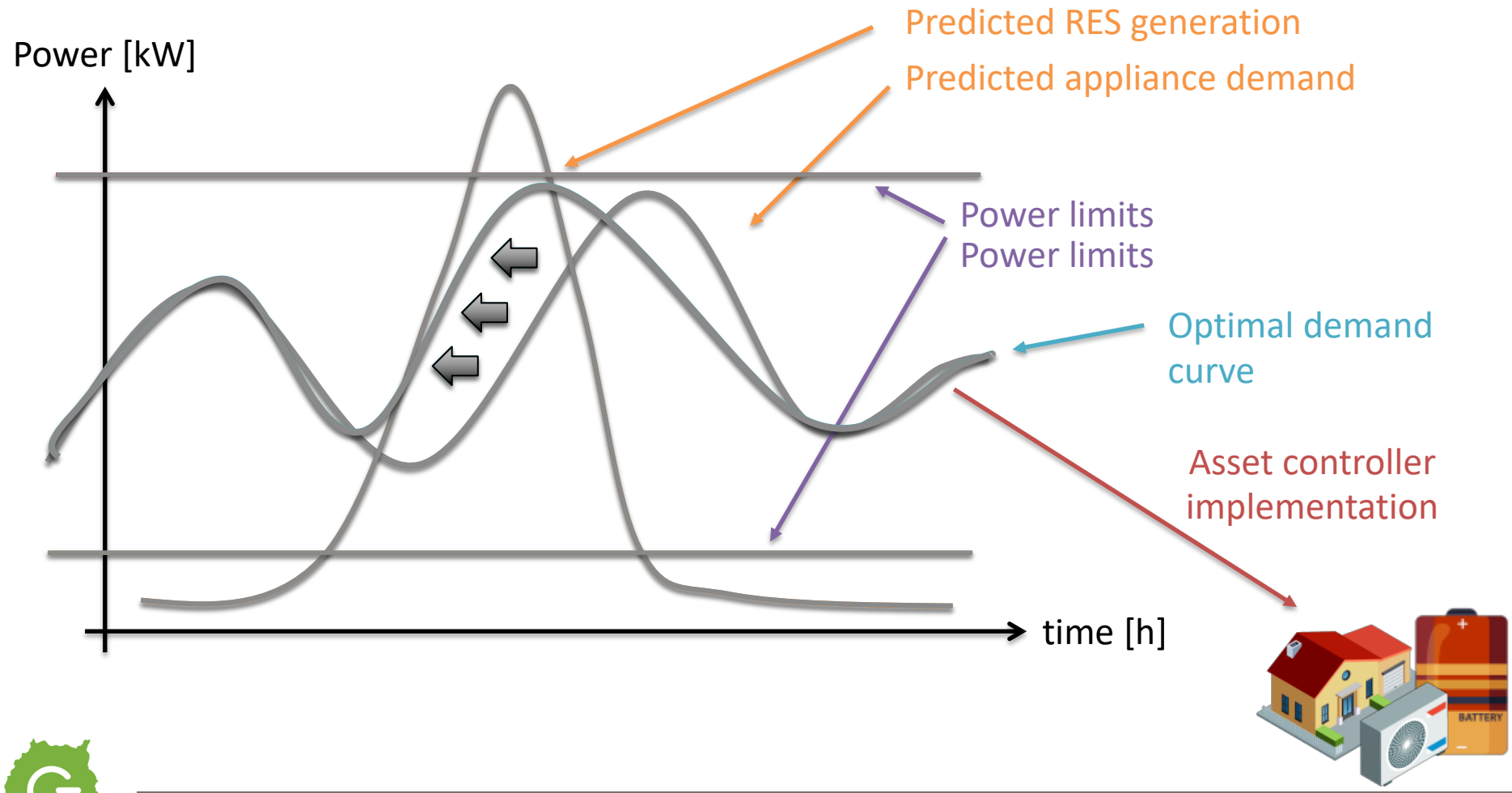


- Energy community perspective



REACT control loop

- Illustrated workflow



Production and demand forecasting

Grid capacity management

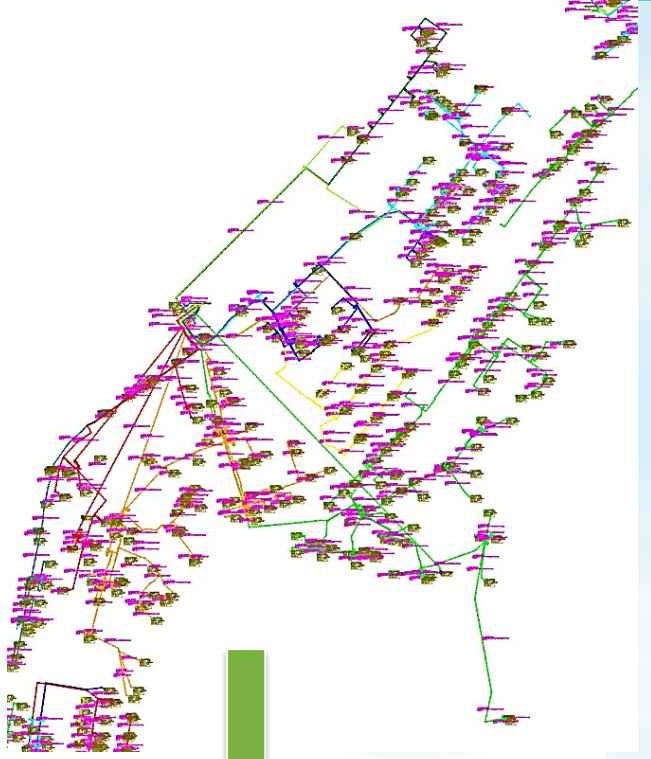
Energy dispatch optimization

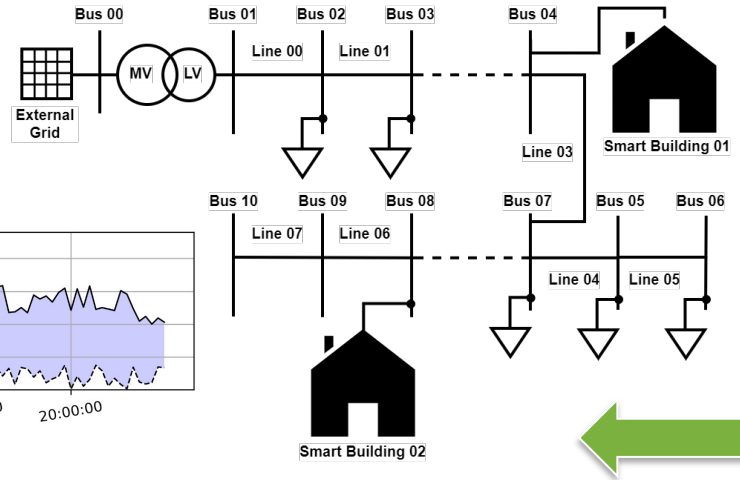
Orchestration and control

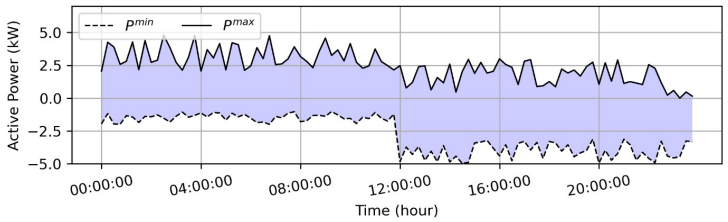
End user assets and appliances

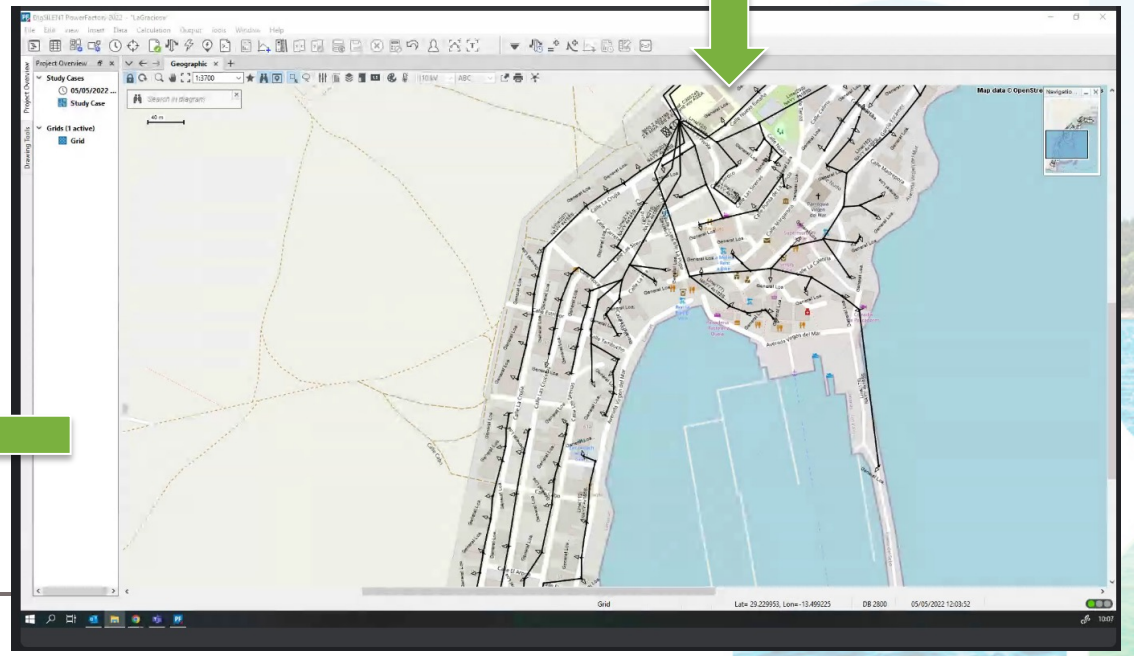
Grid capacity management

- Fully integrated LV grid model (La Graciosa) vs Energy community approach (San Pietro)
- Consumer arrangement based on grid diagrams
- DSO cooperation is key
- Scale of REACT solution distribution





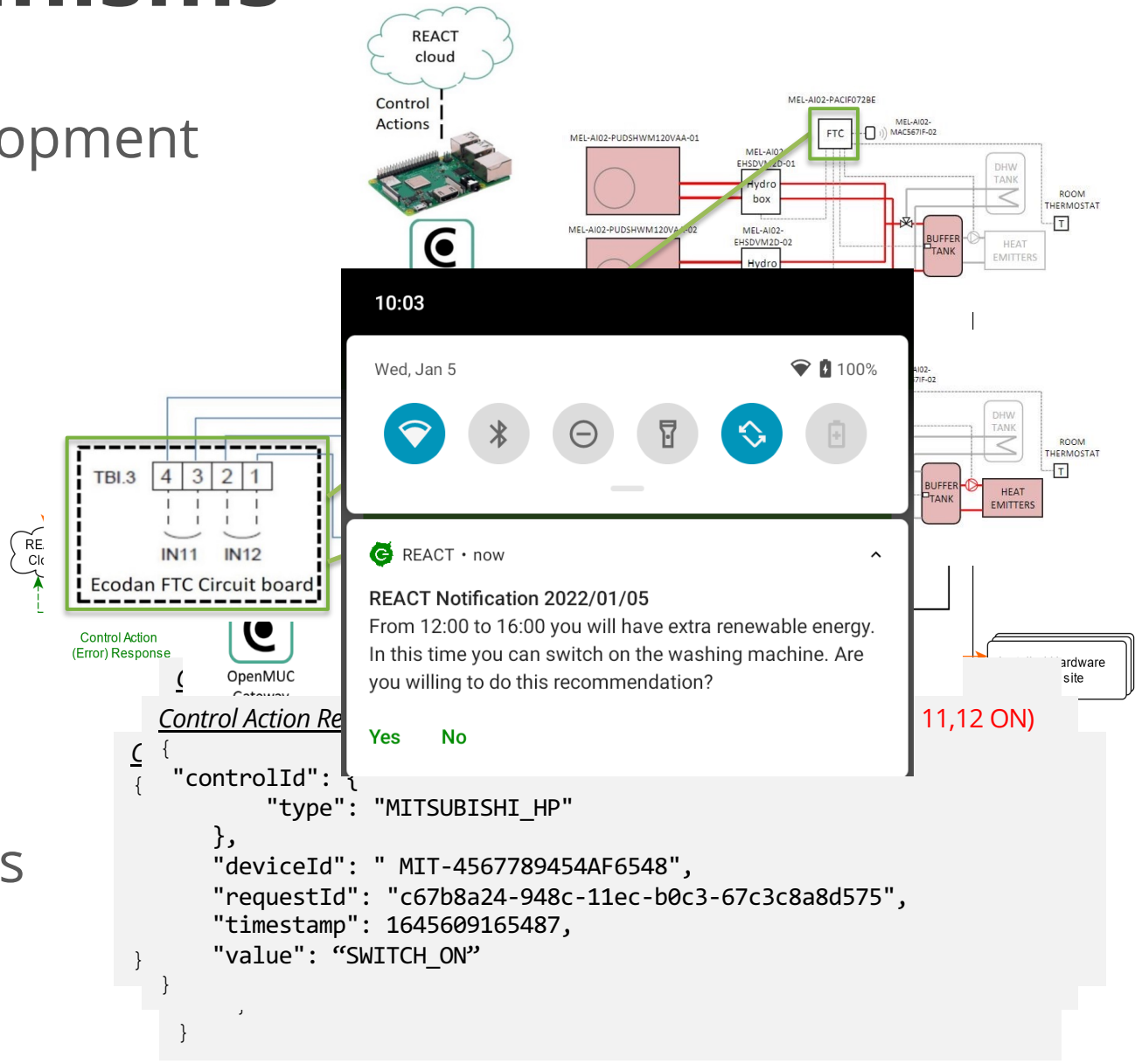




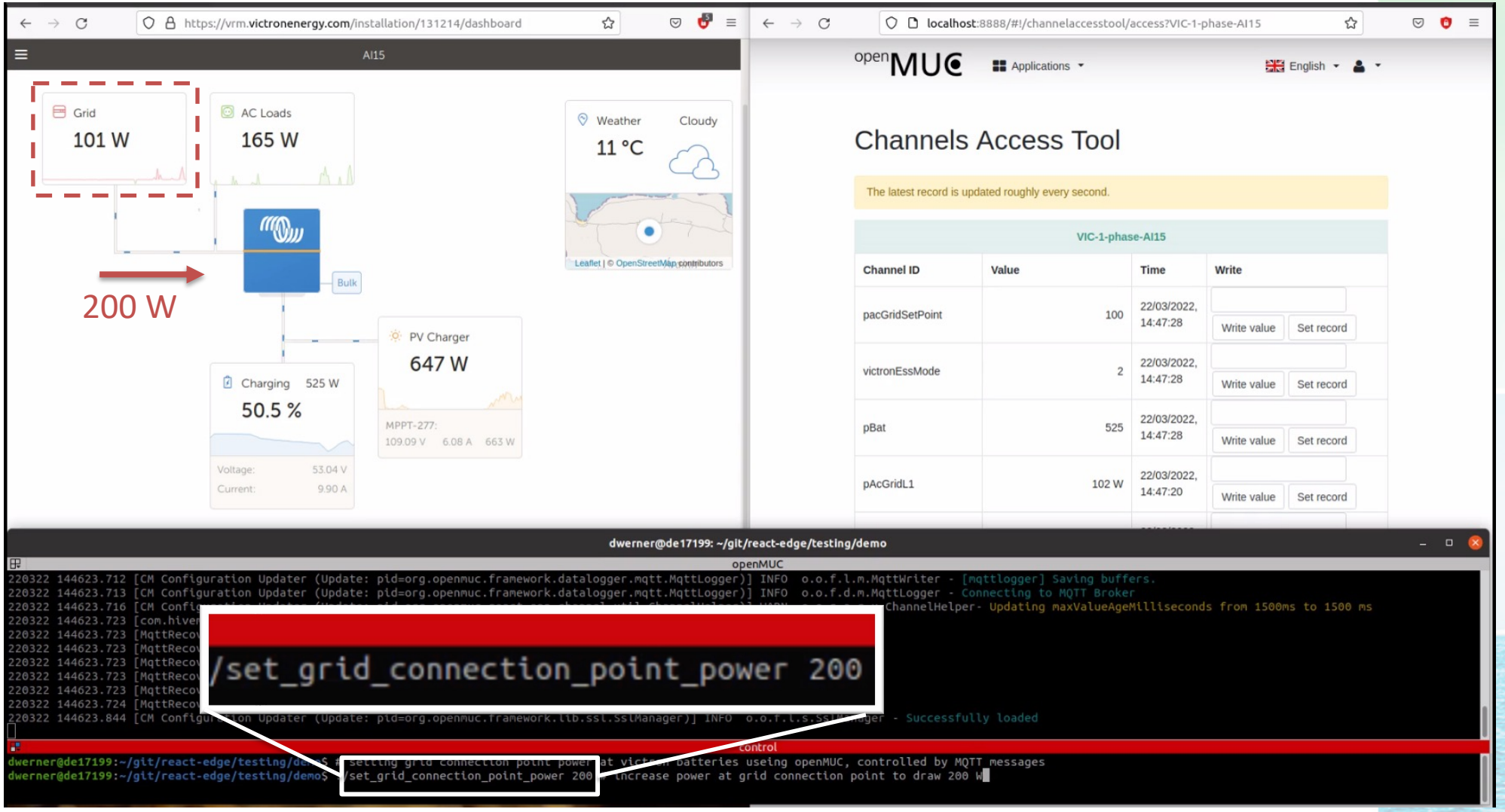
Asset control mechanisms

- Energy gateway (openMUC) development
- Control orchestration

- Direct device management
  - Batteries & inverters
  - Power-to-hydrogen
  - EV chargers
  - (Large-scale) heat pumps
- Indirect controls
  - Load adjustment suggestions



Demo case: Controlling grid power



THANK YOU FOR YOUR ATTENTION

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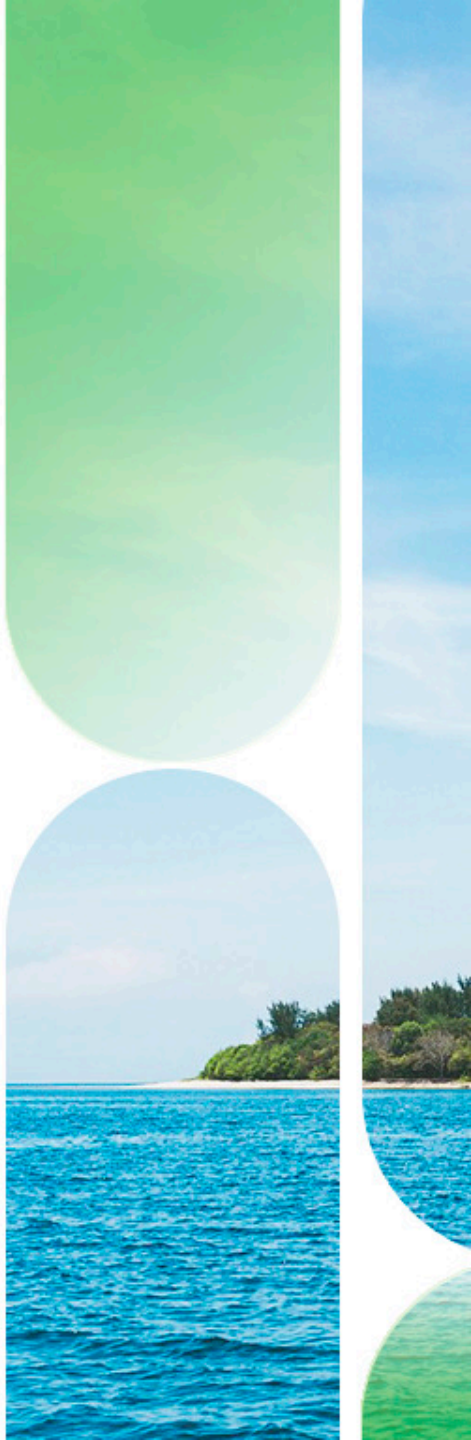
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