

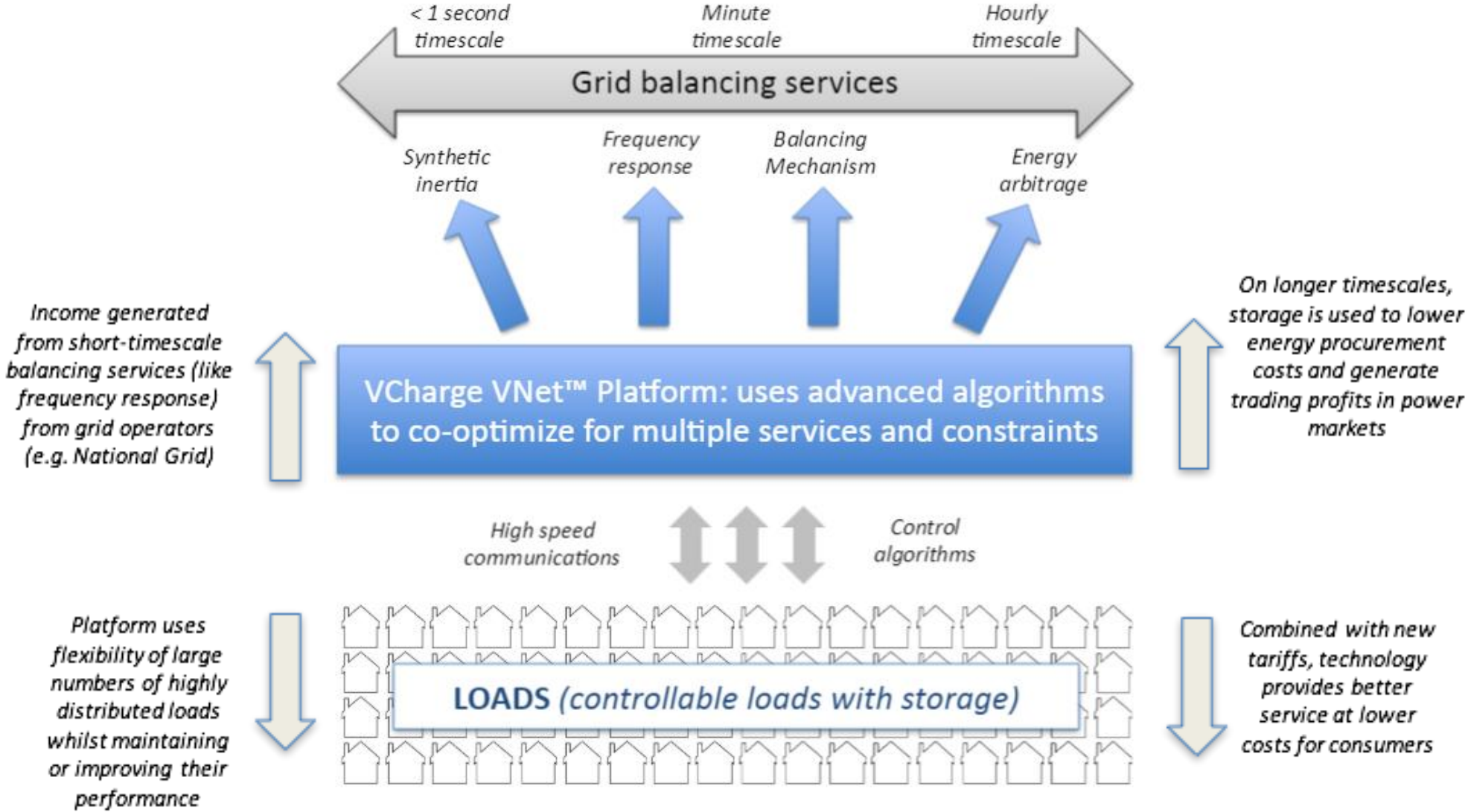


VCharge Introduction

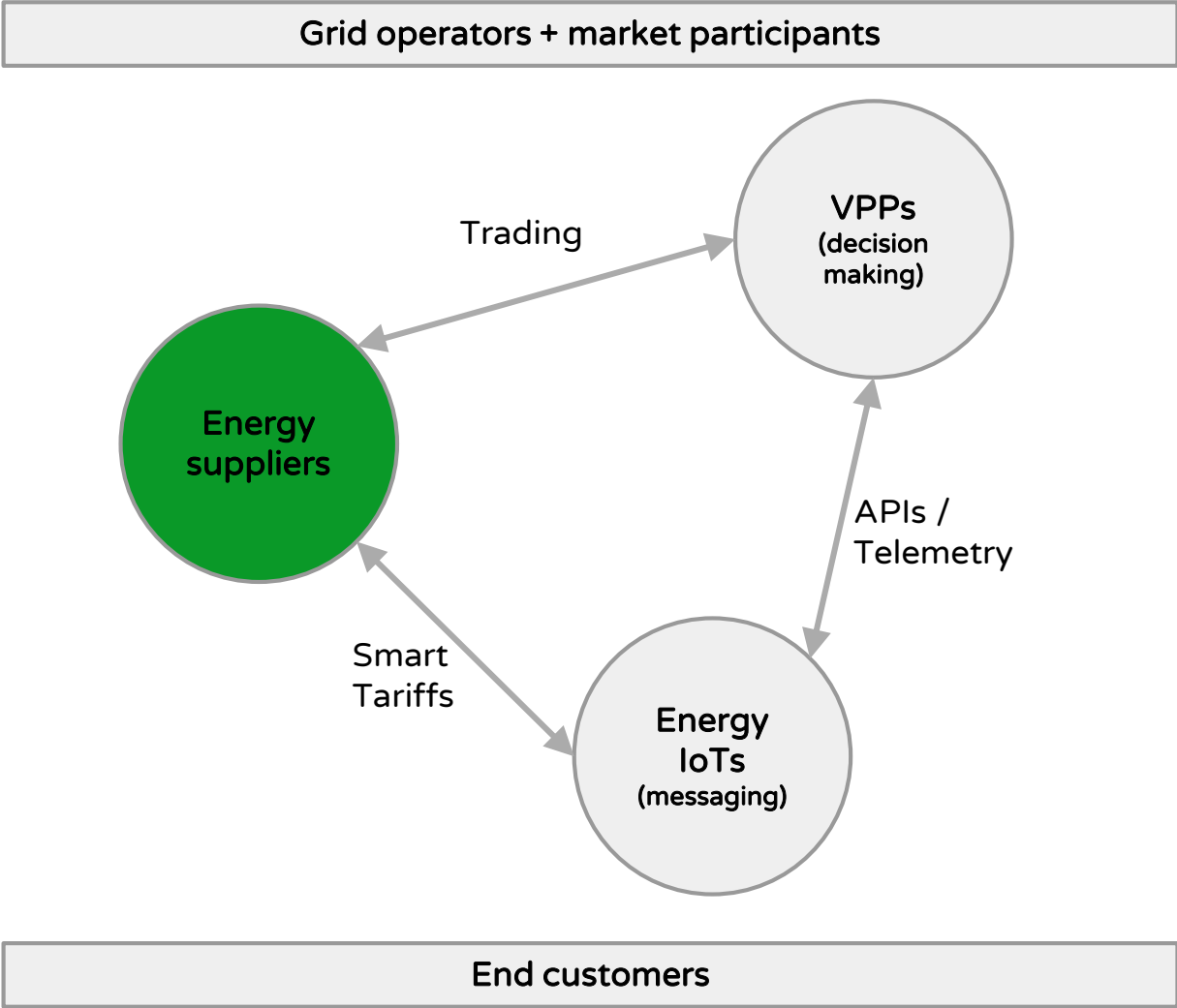
Our mission is to enable 100% renewable energy by changing the control architecture of the electric grid



The VCharge platform aggregates energy storage assets to provide multiple grid balancing services



The role of energy suppliers in the Energy IoT landscape



We're now leveraging these technologies to develop a suite of new propositions

Smart appliances
Electric vehicles

Home energy storage



OVO and VCharge have developed a solution for electric heat customers in the UK



- 1.5m homes in UK with electric storage heaters
- Each electric heater stores 12kWh of thermal energy
- Solution delivers key customer benefits of **control, comfort** and **savings**
- Unlocks grid balancing revenue streams such as frequency regulation, energy arbitrage + others.
- OVO's retrofit solution utilises the VCharge Dynamo retrofit, VNet VPP software platform, OVO smart metering program and a smart tariff

Not too hot or too cold, but just right

Get the most out of your storage heater **for free** with VCharge Dynamo

Get a warm welcome home by turning your storage heaters into a smart heating system with the VCharge Dynamo from OVO. They'll be easy to use and put you in control of the temperature throughout the day. Simply switch to OVO Energy and we'll install them free so you can enjoy the benefits.

- ✓ Control your storage heaters by app or over the phone
- ✓ Set the temperature for each room individually
- ✓ Reduce your heating costs with extra off-peak hours in the day



"My friend takes her coat off as soon as she comes in now - she never did that before!"

Irene, Newcastle



Hardware: Dynamo 2.0 controller can be retrofitted to any storage heater



User interfaces: Apps enable fast installation and user controls



Smart meter: Removes existing charging restrictions and enables half-hourly settlement



VCharge Island Projects

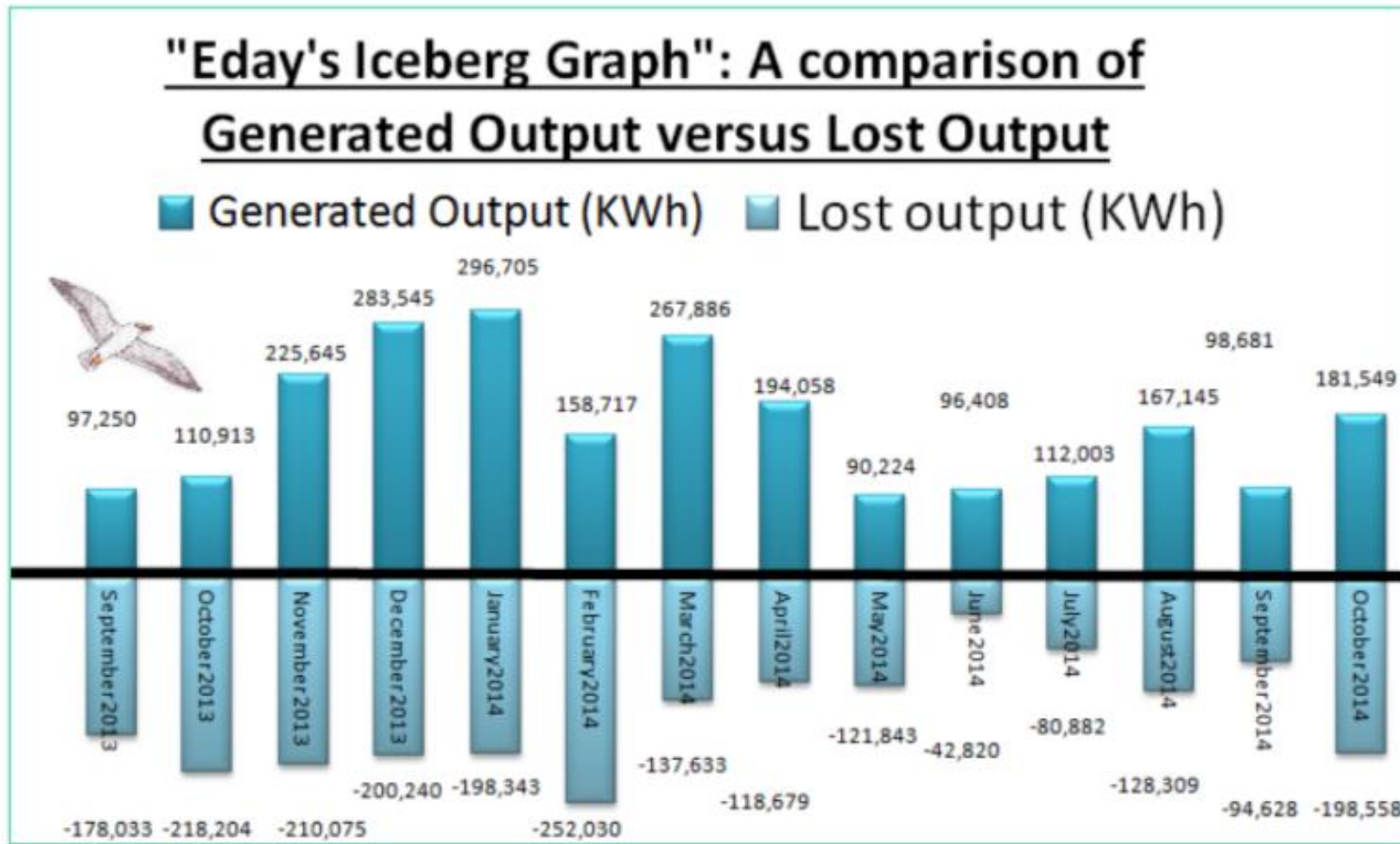
ACCESS Project: Assisting
Communities to Connect to
Electric Sustainable
Resources



Heat Smart Orkney Project

SMILE Project: Smart IsLand Energy
Systems

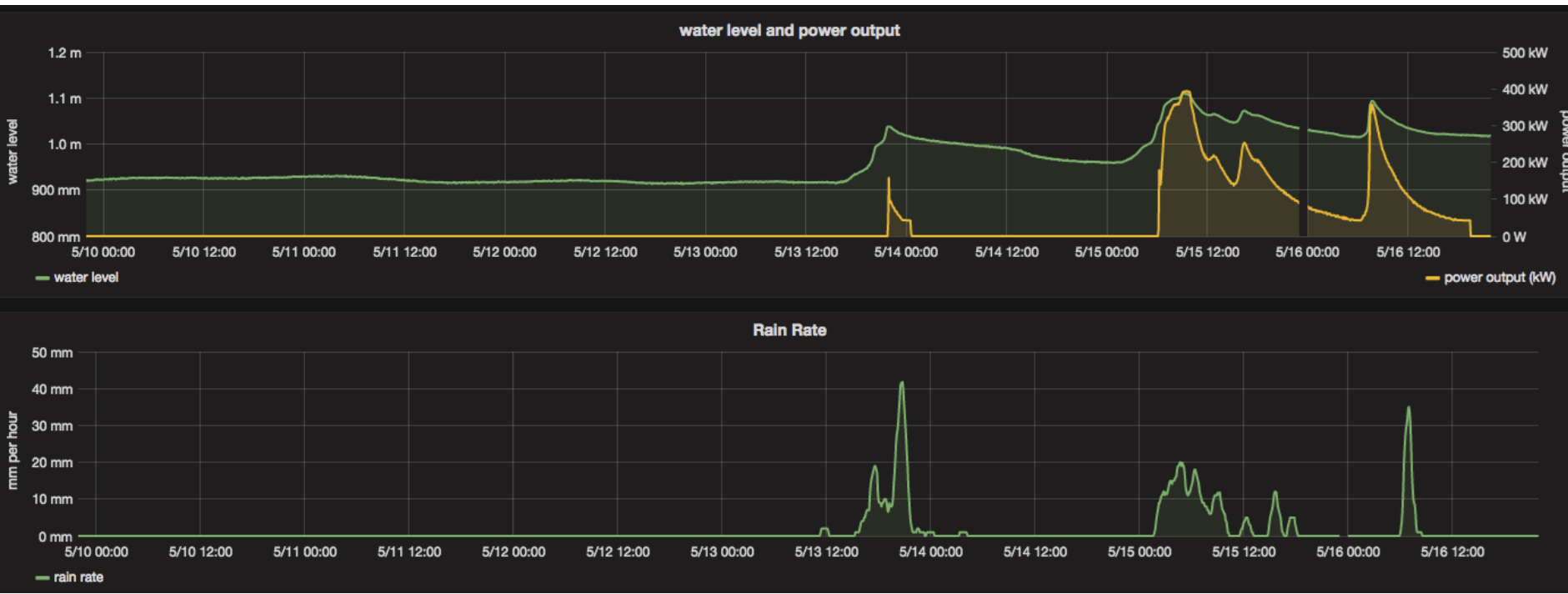
Curtailment Problem



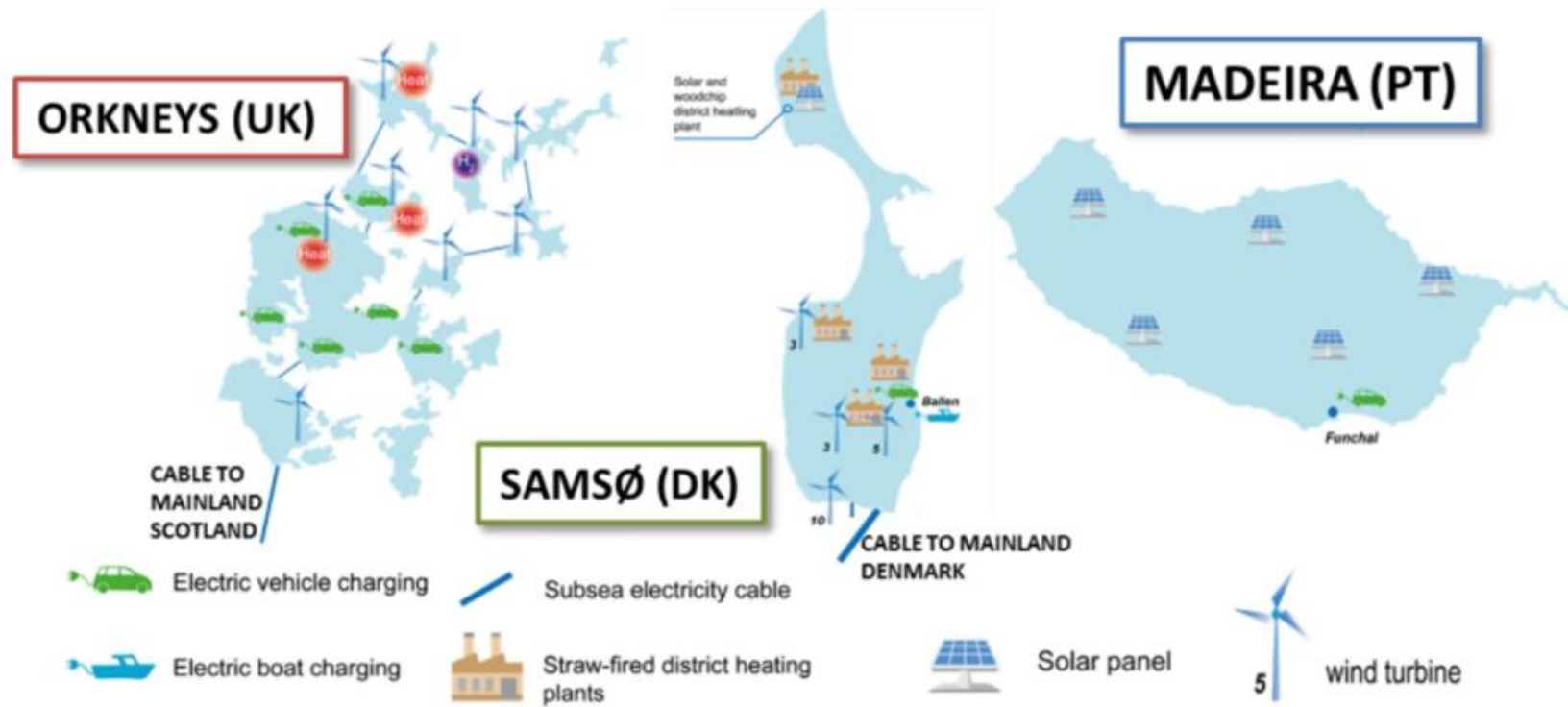
*Courtesy Andrew Stennett,
ERE*

Mull: Managing Output Constraints

- SSE rule: non-firm generation connections cannot exceed 50 kW
- Garmony Hydro: 400 kW maximum output



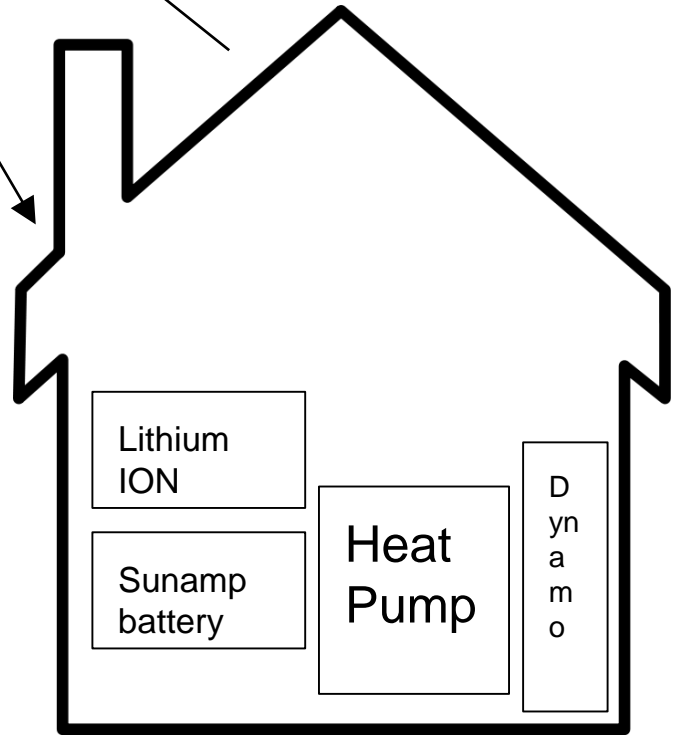
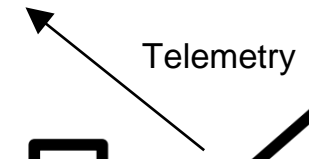
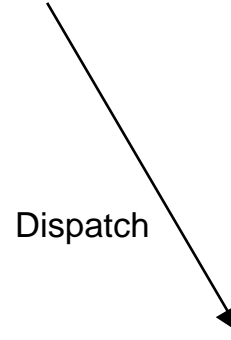
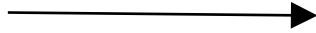
SMart IsLanD Energy Systems



- A large-scale smart grid demonstration project in three European island locations addressing real issues with the local energy systems



(VScon) VCharge Supervisory CONTROL and data acquisition connect device



Thank you

