



Case studies from the edge of the grid

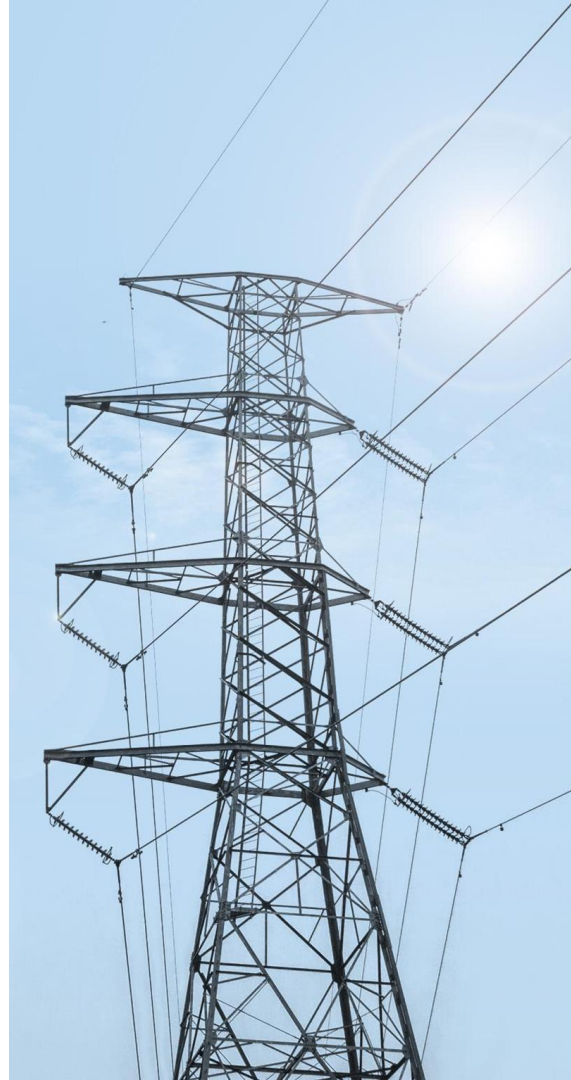
Gary Childs | Small-scale Energy Storage Forum 2019

About SwitchDin

Enabling Tomorrow's Energy:

Solar, batteries & loads made smart

- Australian energy tech company founded in 2014
- Energy management system software & hardware
- Integrate equipment from different manufacturers
- Enable microgrids & virtual power plants
- Work with electricity companies, equipment manufacturers/integrators, and solar panel retailers
- Multiple projects with tier 1 clients around Australia; early market entry into EU & North America



Lockhart River Community Microgrid (Lockhart River, QLD)



Energy Queensland's Lockhart River microgrid

- Stand-alone microgrid in far-north QLD for community of ~700 people
- Formerly supplied solely by diesel fuel
- Goal: To meet energy reliability requirements & reduce diesel consumption



Queensland
Government



yurika

Part of the Energy Queensland Group



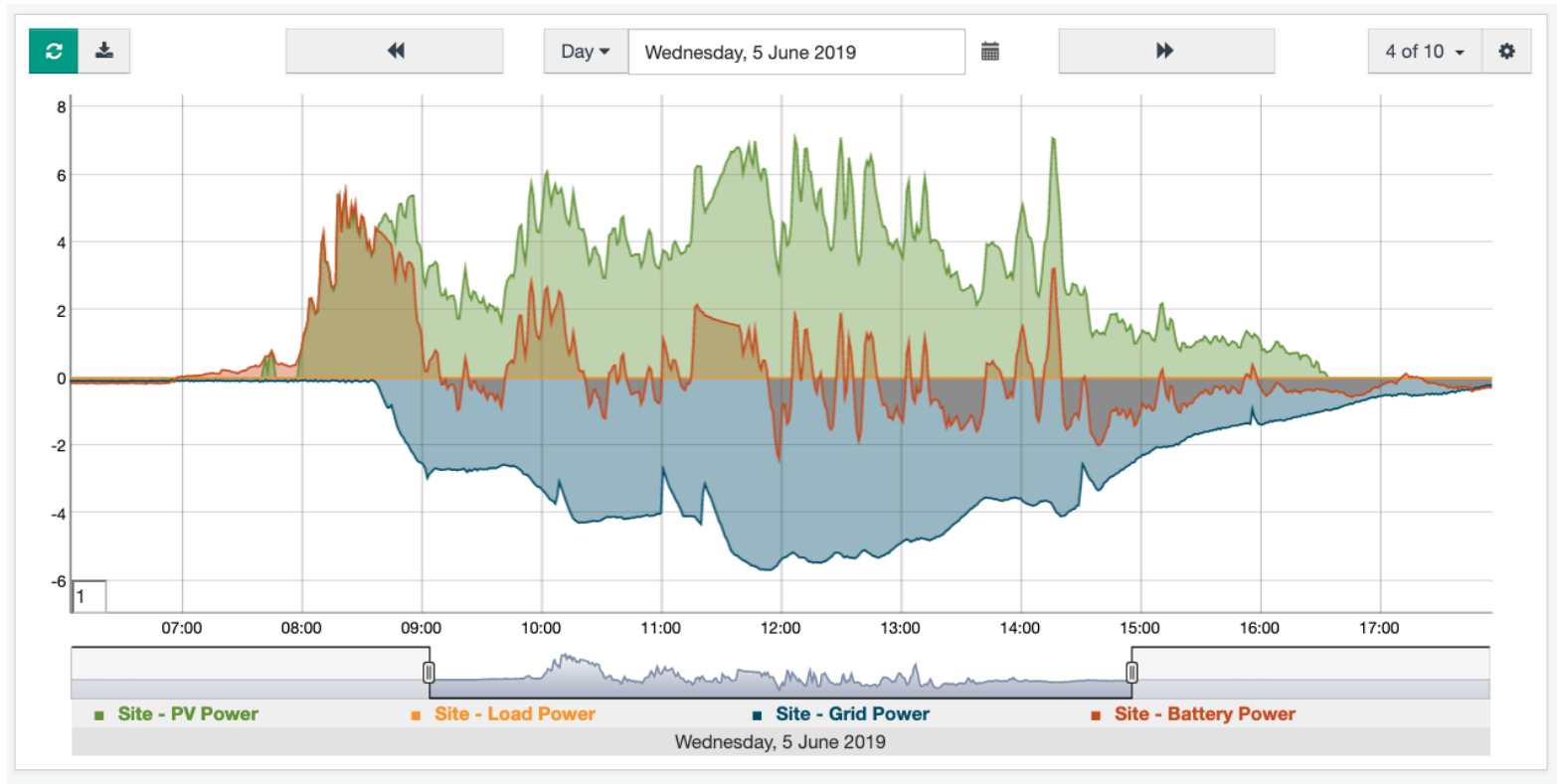
Energy Queensland's Lockhart River microgrid

The solution:

- Solar & batteries installed across 4 sites, each equipped with a Droplet
- SMA & Selectronic inverters, Ecoult batteries, Schneider MPPTs
- SwitchDin Droplets integrated into Ergon's Power Station Controller (PSC) and abstract data from distributed resources, providing consolidated monitoring & control
- Droplets implement PSC instructions in real-time



Solar smoothing at Lockhart River



A large, vibrant red lobster is the central focus, resting on a light-colored sandy beach. Its long antennae are extended upwards and outwards. In the background, the blue ocean stretches to the horizon, with two large white ships visible in the distance. The sky is a clear, pale blue. A white rectangular box with a thin black border is positioned on the left side of the image, containing the title text in a bold, teal font.

Lobster Shack Industrial Microgrid (Cervantes WA)

Industrial microgrid for constraint management

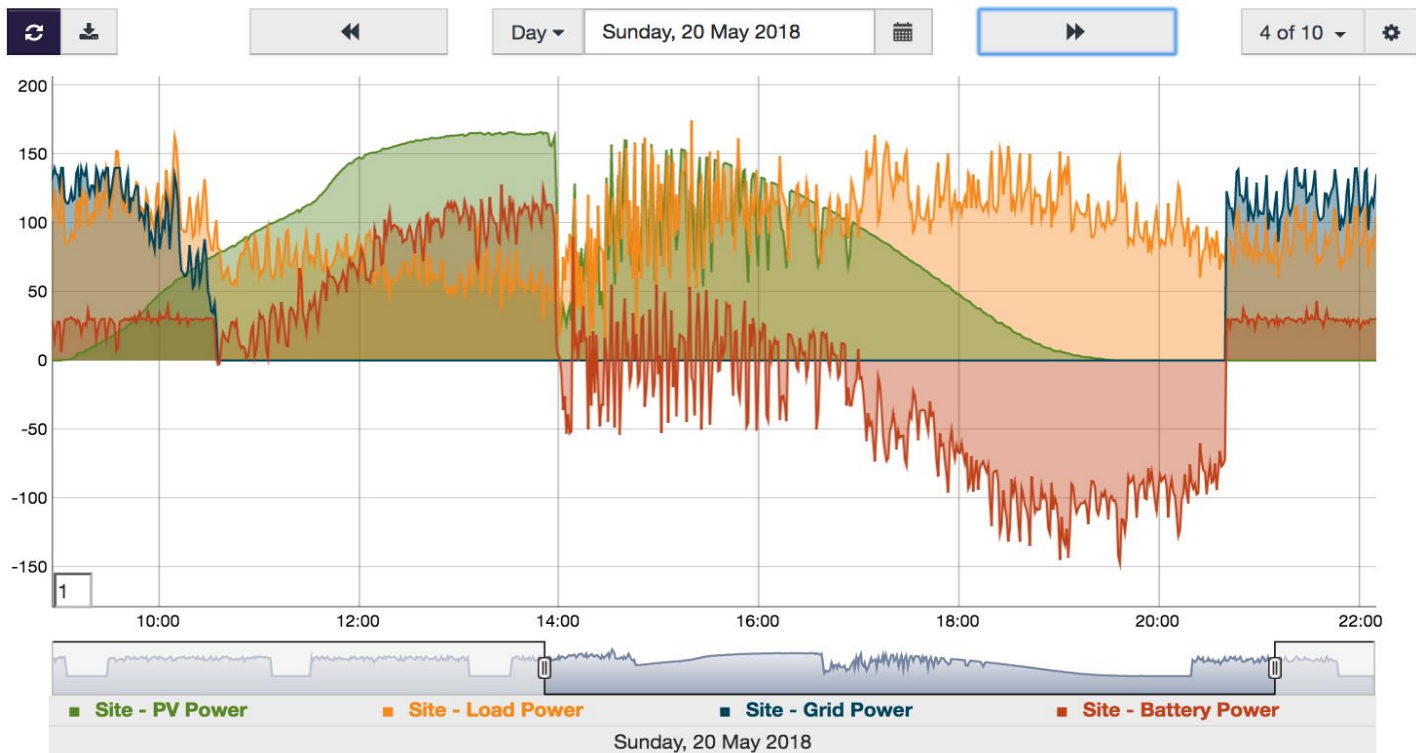
- SwitchDin maximises energy independence while working within local network constraints (import & export)
- 150kW solar, 750kWh batteries, 160kW generator
- Power stays on during (frequent) grid outages
- Cutting-edge approach to grid connection



WALNUT ENERGY SYSTEMS

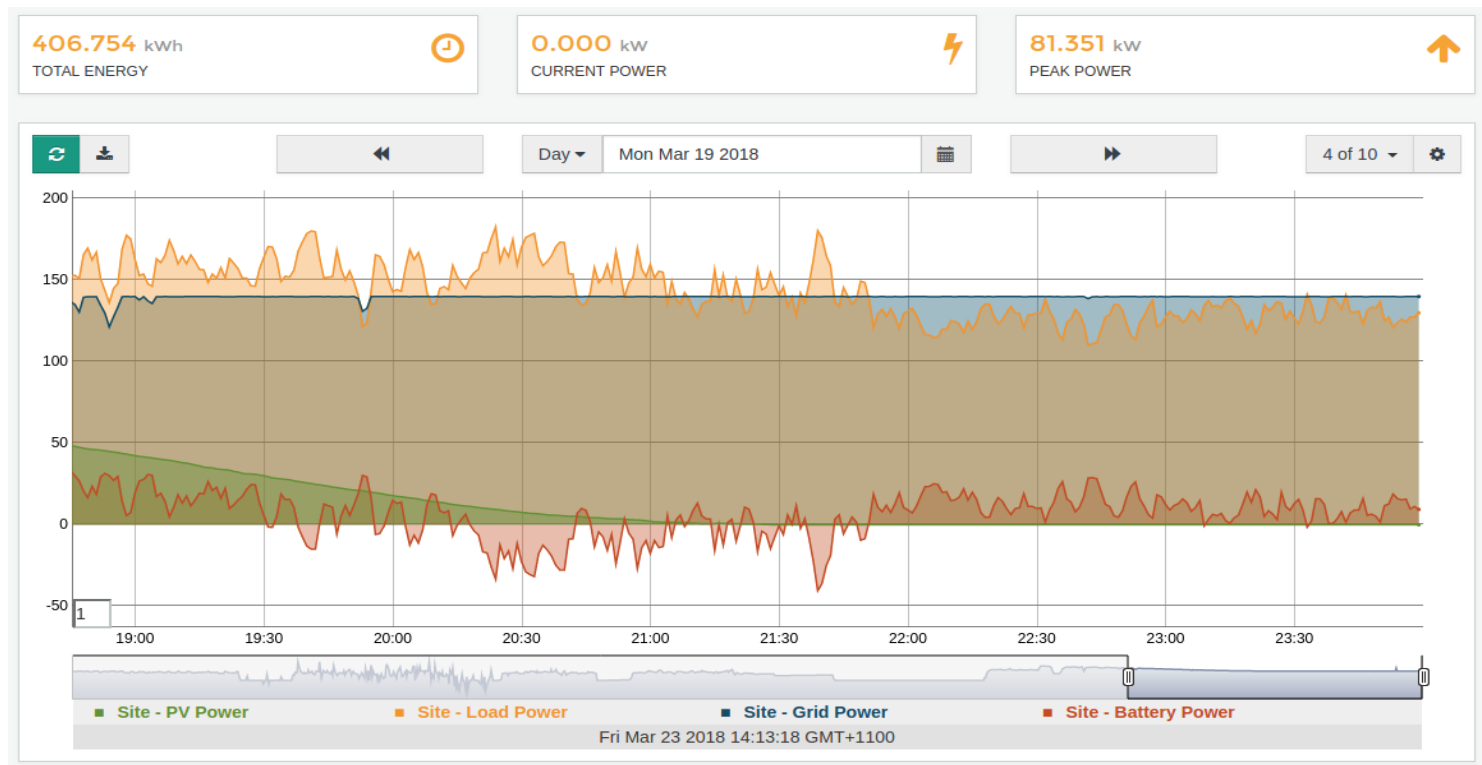
Industrial microgrid (WA)

Self-consumption, solar smoothing & blackout protection



Industrial microgrid (WA)

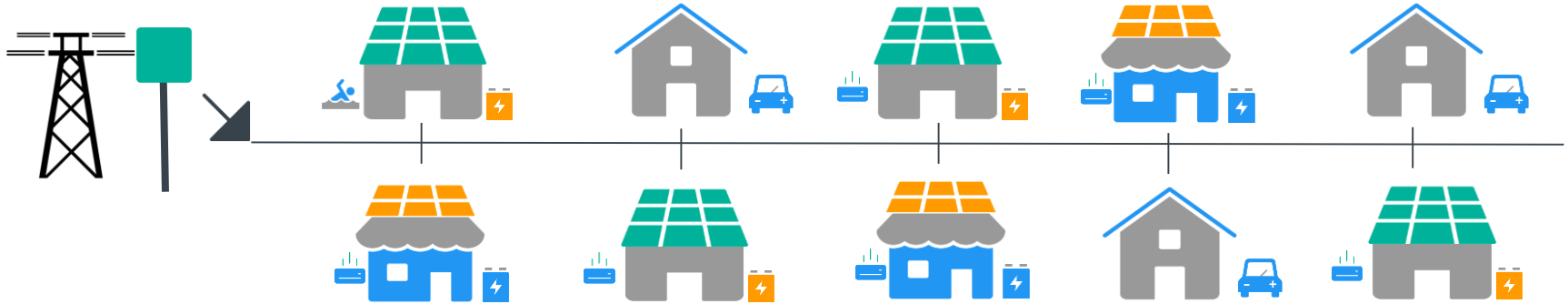
Demand management: Working within grid constraints (battery fills in the gaps):



Horizon Power Smart Sun Pilot (Broome WA)




Horizon Power Smart Sun Pilot: Dynamic constraint management



- Too much solar: Voltage issues, reverse power flows
- Closed-loop monitoring & management of distributed resources via readings at transformer

Customisable merit order





Broome
[Home](#) > Virtual Power Plants > Broome



[Status](#) [Operation](#) [Group](#) **Merit** [Users](#)

Demand Reduction





ADD

UP/DOWN	Device	Control	Description	Merit No.	
↓	A/C	OI3	Limit Load to 75%	5	
↑	A/C	OI2	Limit Load to 50%	6	
↑	BESS	OI8	Export As Much As Possible	7	
↓	A/C	OI1	Limit Load to 0%	8	

[Cancel](#) [Save](#)

Demand Increase

ADD

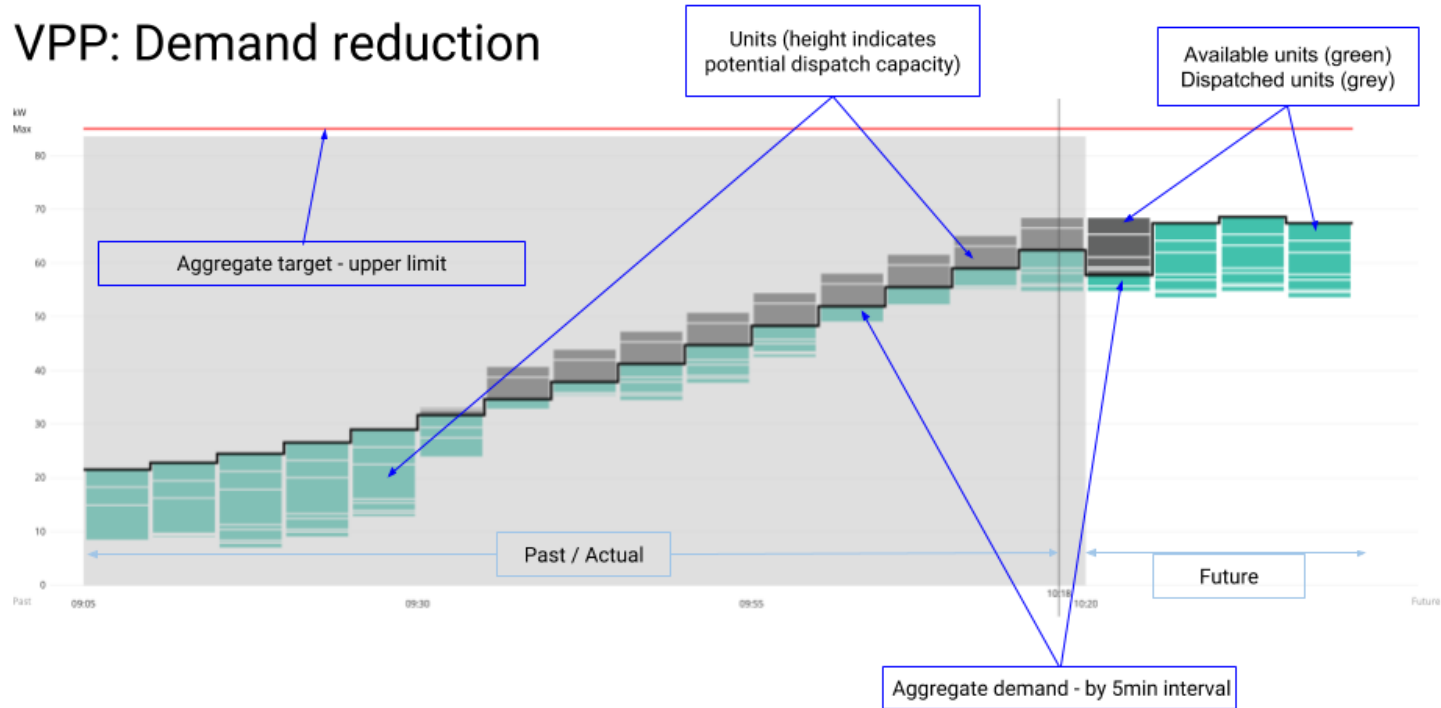
UP/DOWN	Device	Control	Description	Merit No.	
↓	BESS	OI4	Increase Load If Possible	1	
↑	PV-INV	OI7	Limit Export to 75%	2	
↓	PV-INV	OI6	Limit Export to 50%	3	
↑	PV-INV	OI5	Limit Export to 0%	9	

[Cancel](#) [Save](#)

Managing distributed assets

Stages 2 & 3 underway soon

VPP: Demand reduction





Thank you!

info@switchdin.com

Other projects

BCG regional microgrid, Oak Tree Retirement Villages



Lockhart River microgrid: Results to date

- 8% reduction in diesel fuel consumption (62,000 litres, 50hrs genset runtime)
- Real-time info & operations portal used to understand local conditions following cyclone impacts, increasing safety & speed of response to issues
- Droplets continued to operate without comms for weeks after lightning struck Telstra tower



By providing balance to the relationship between renewable energy asset owners and utilities ... we maximise the value of these distributed energy resources to all.

Droplet controller: Features & benefits

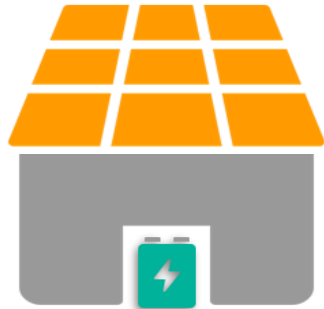
- Vendor-agnostic: Works with most inverters, batteries, power meters, load controllers and sensors
- Improves user experience with web and mobile portal
- Utility-grade security available in both communications and cloud platform
- Improves cost effectiveness and reduces technology and supply risk
- Can also be deployed as software

Droplet™



In a nutshell: Small picture to big picture

Optimisation of solar, batteries & loads for homes & businesses - vendor neutral



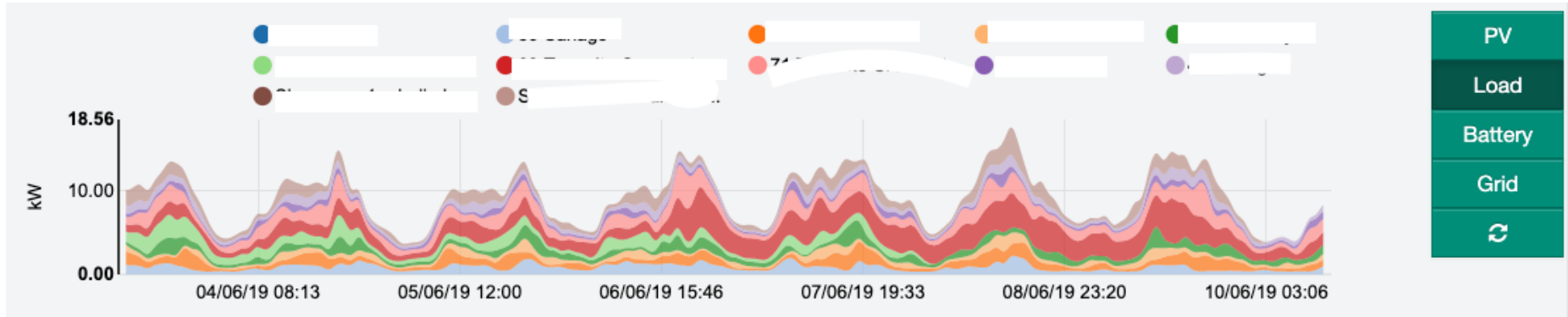
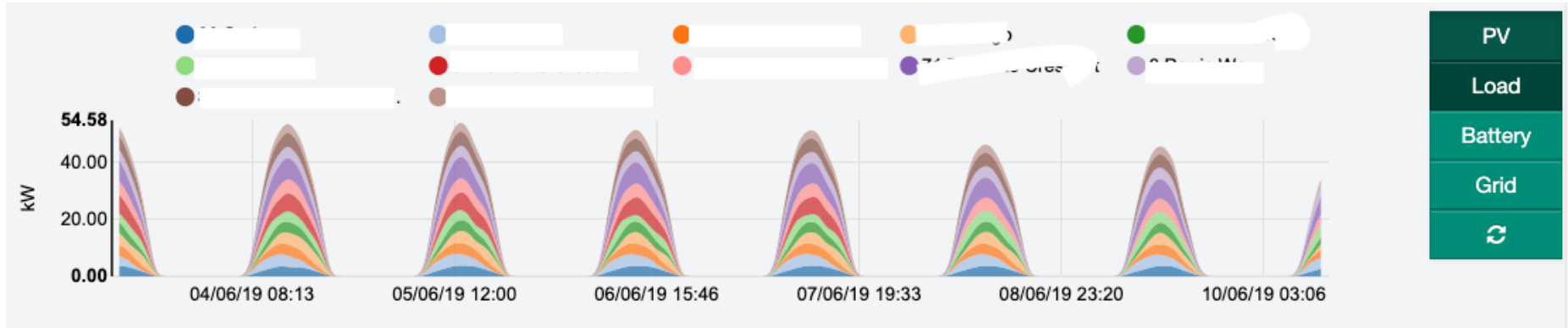
Better outcomes for local networks - overcome challenges with high solar penetration, better use of local resources



Enable small-scale solar, batteries & loads to participate in energy markets, providing wholesale energy, frequency response and other services



Asset portfolio monitoring



Device controls

Droplet

+

 Add Device

Status

Configuration

A/C Living (RZQ100LV1)

A/C Bed 1 (RXS25LVMA)

A/C Playroom (RXS35LVMA)

A/C study (RXS25LVMA)

A/C Bed 2 Removed

A/C Bed 4 (RXS25LVMA)

Controlled Fronius Grid Tied Inverter

Controlled Sonnen Battery Inverter

TM Oreg Scient (Laundry)

Site Aggregates

Xiaomi Mija Thermo Hygro Sensor

Device Controls

Control	Actuator	Description
O10	<div>O10</div> Off	Disconnect
O15	<div>O15</div> Off	Limit Export to 0%
O16	<div>O16</div> Off	Limit Export to 50%
O17	<div>O17</div> Off	Limit Export to 75%
O18	<div>O18</div> Off	Export As Much As Possible

switchDin

Australian English (en-au)

+

 Claim an Endpoint

Droplet

+

 Add Device

Status

Configuration

A/C Living (RZQ100LV1)

A/C Bed 1 (RXS25LVMA)

A/C Playroom (RXS35LVMA)

A/C study (RXS25LVMA)

A/C Bed 2 Removed

A/C Bed 4 (RXS25LVMA)

Controlled Fronius Grid Tied Inverter

Controlled Sonnen Battery Inverter

TM Oreg Scient (Laundry)

Site Aggregates

Xiaomi Mija Thermo Hygro Sensor

Device Controls

Control	Actuator	Description
O11	<div>O11</div> Off	Limit Load to 0%
O12	<div>O12</div> Off	Limit Load to 50%
O13	<div>O13</div> Off	Limit Load to 75%

switchDin

Australian English (en-au)

+

 Claim an Endpoint

Overview

Performance

Live

Devices

Events

Settings

Users

Alerts

Raw Data

+

 Claim an Endpoint

Droplet

+

 Add Device

Status

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A/C Living (RZQ100LV1)

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O12	<div>O12</div> Off	Limit Load to 50%
O13	<div>O13</div> Off	Limit Load to 75%
O14	<div>On</div> <div>O14</div>	Increase Load If Possible
O15	<div>O15</div> Off	Limit Export to 0%
O16	<div>O16</div> Off	Limit Export to 50%
O17	<div>O17</div> Off	Limit Export to 75%
O18	<div>O18</div> Off	Export As Much As Possible

switchDin

Australian English (en-au)

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 Claim an Endpoint