



Australian
National
University



Battery Storage and
Grid Integration
Program

An initiative of The Australian National University

Converge consumer workshop

Today's aim

Understand your thoughts about householder batteries and other appliances integrating with the grid and about some new technical solutions that are supporting this integration.



Agenda

Time	Activity
6:30 – 6:55	Intro, welcome, background
6:55 – 7:15	Breakout group 1
7:15 – 7:20	Coffee, leg stretch
7:20 – 7:45	Background 2
7:45 – 8:25	Breakout group 2
8:25 – 8:30	Close



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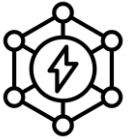
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Background 1: The electricity network

Definitions



Distributed resources



Grid integration



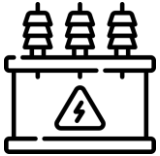
Virtual power plant



What is making the grid change?

- **Peak demand** increases – Air conditioning, hot water, pool pumps (future) EVs
- **More generation** – Rooftop PV, home batteries
- **Decarbonisation** – Likely results in more of these things

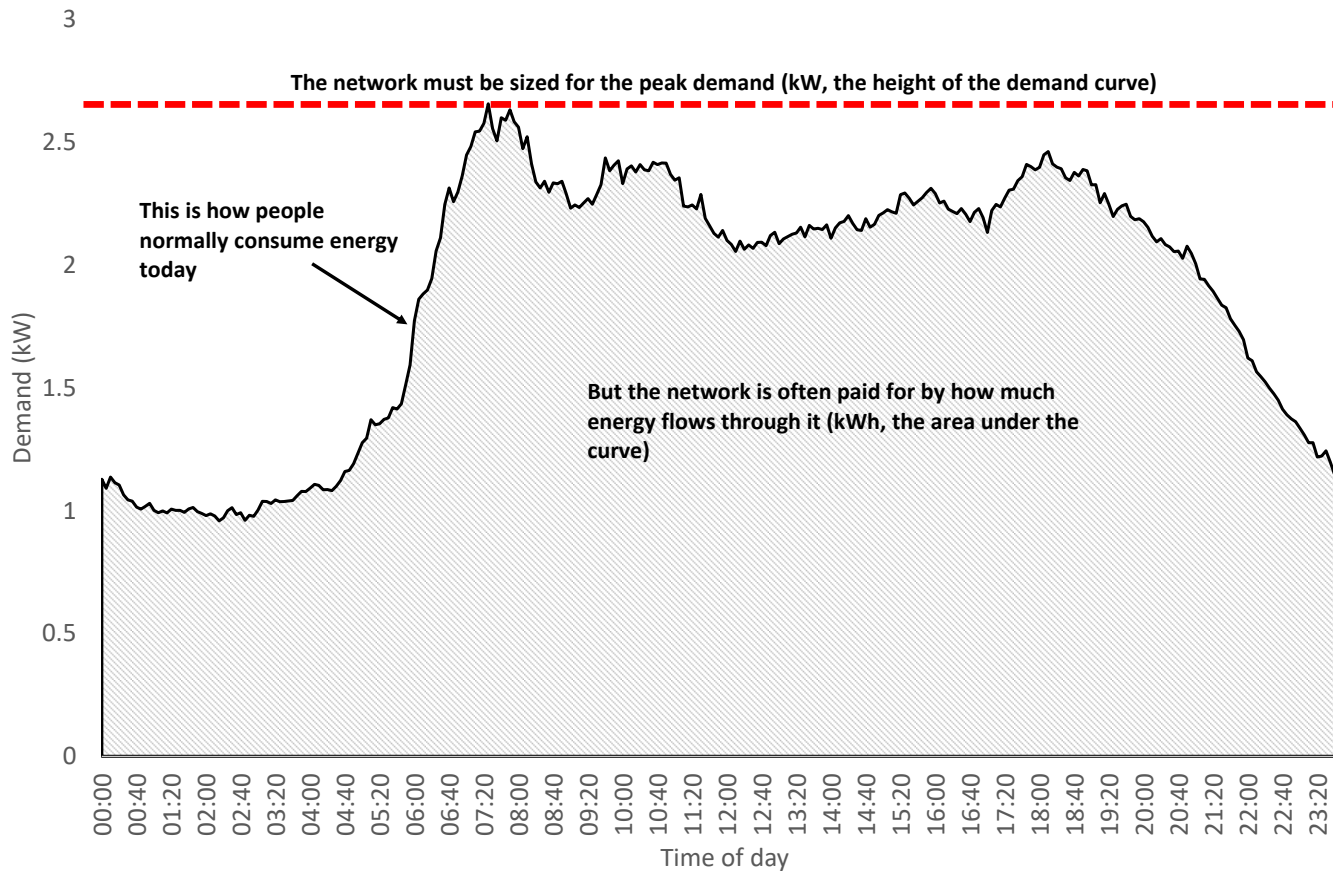
Capacity in the grid

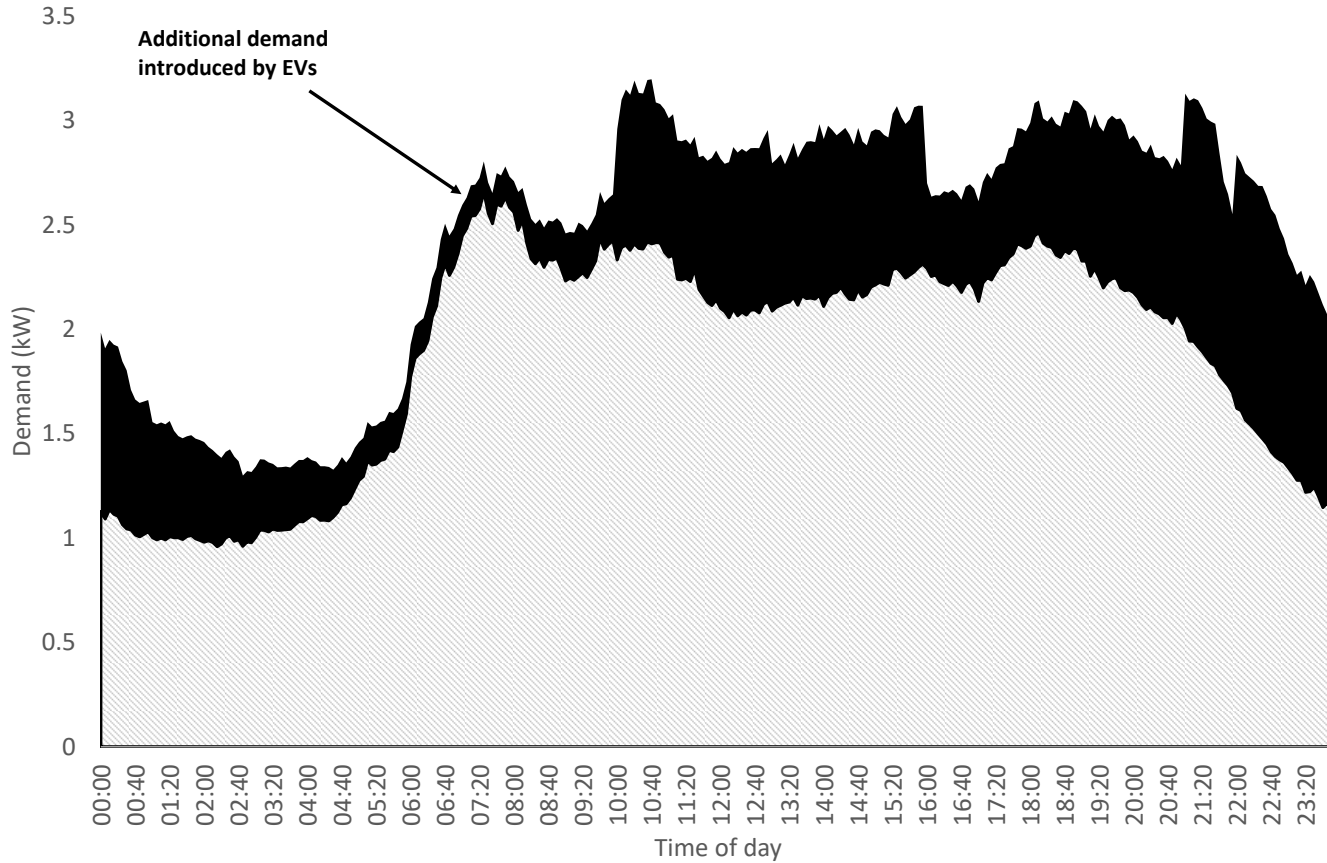


Ensuring grid assets have a long life

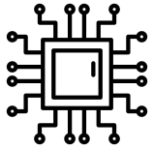


Ensuring power quality





Opportunities



New, cheaper technology



Better communications



Electrification and decarbonisation



Summary

- Distribution networks ensure there is enough capacity to supply peak demand
- Shifting consumption or generation can reduce network size
- New technology could help or harm this goal



Moving to breakouts

- Three groups
- 30 minutes in breakouts to discuss your perspectives on the themes we presented
- Then a break



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Welcome back!



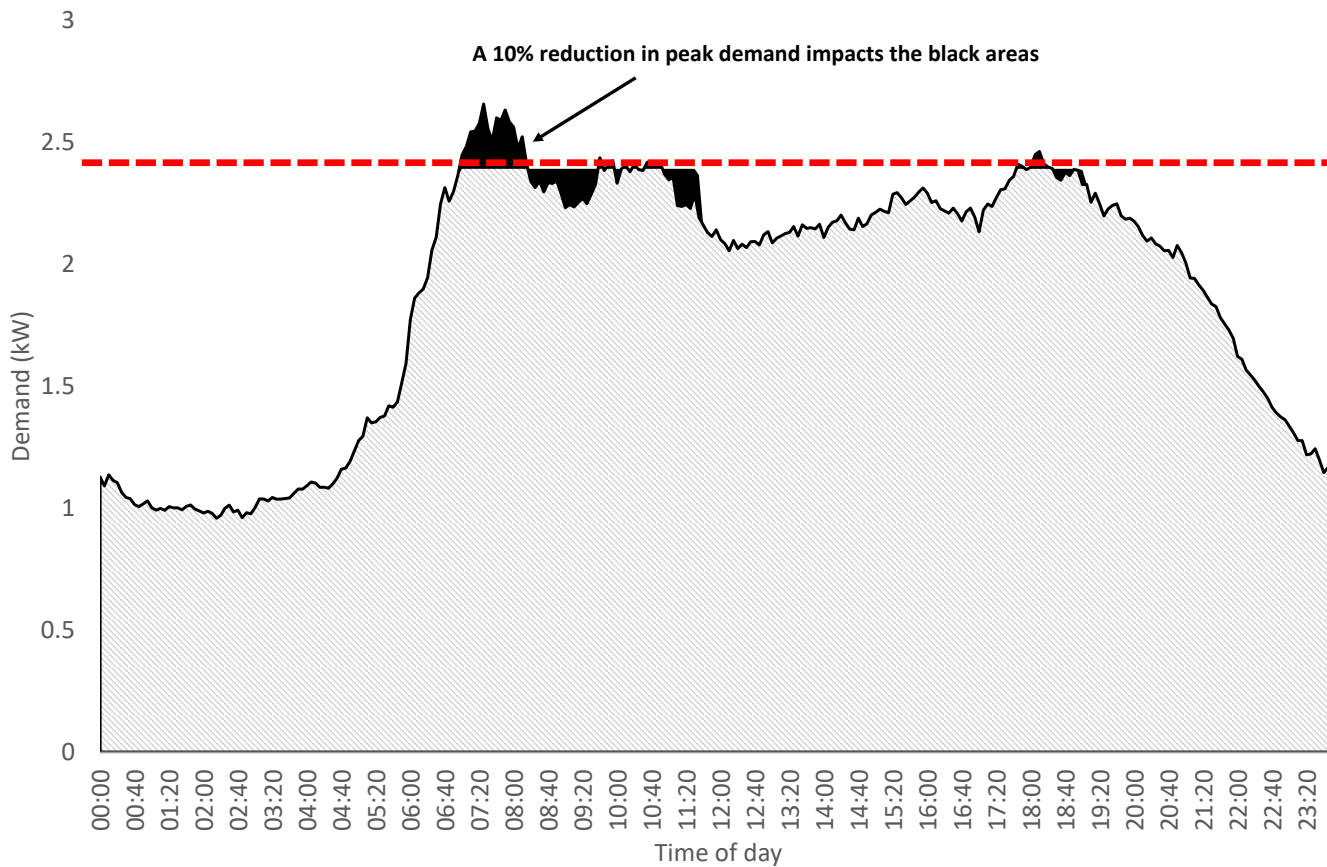
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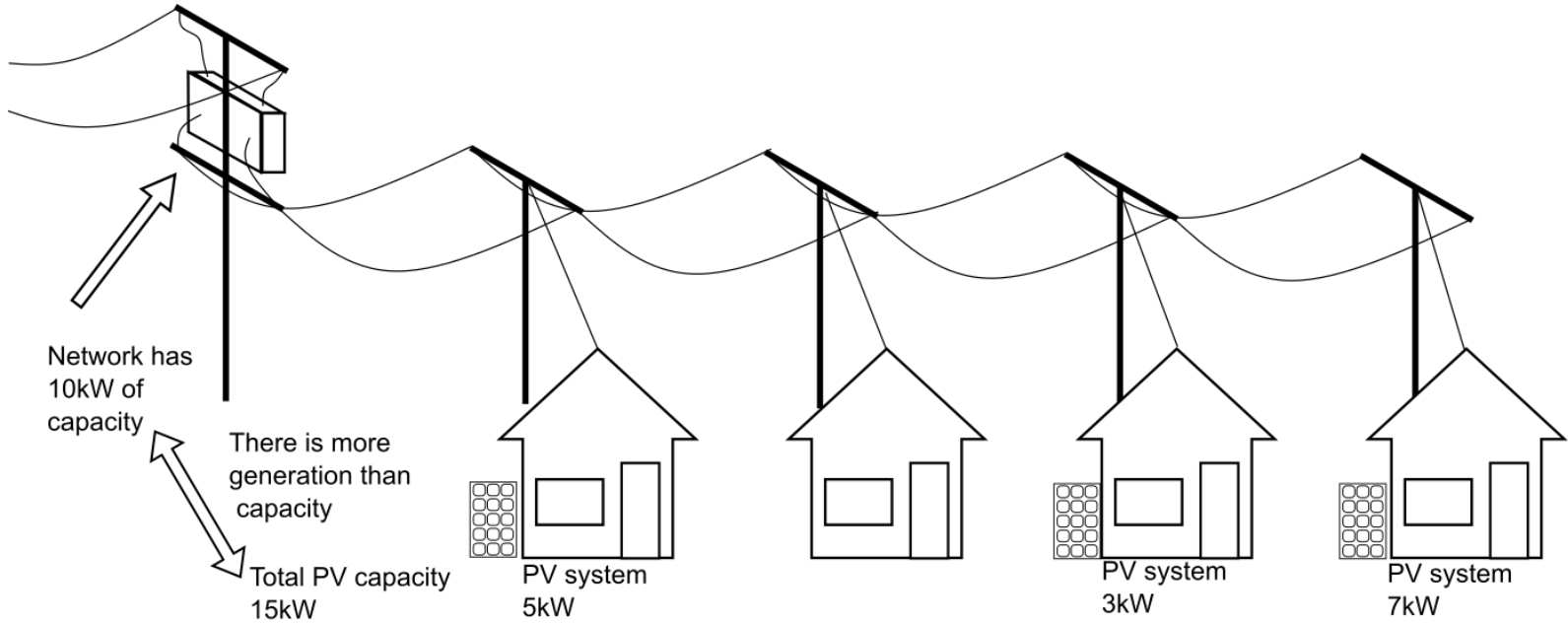


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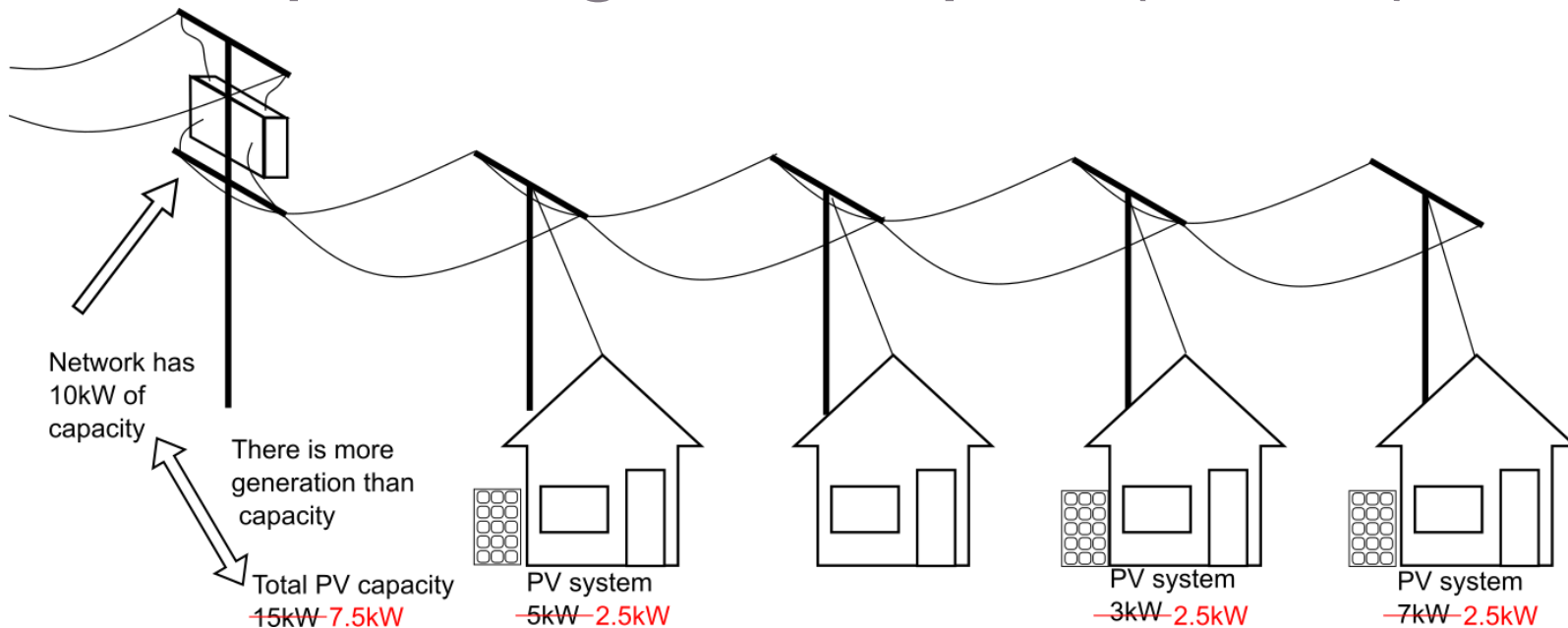
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Background 2: FOE, DOE, SOE



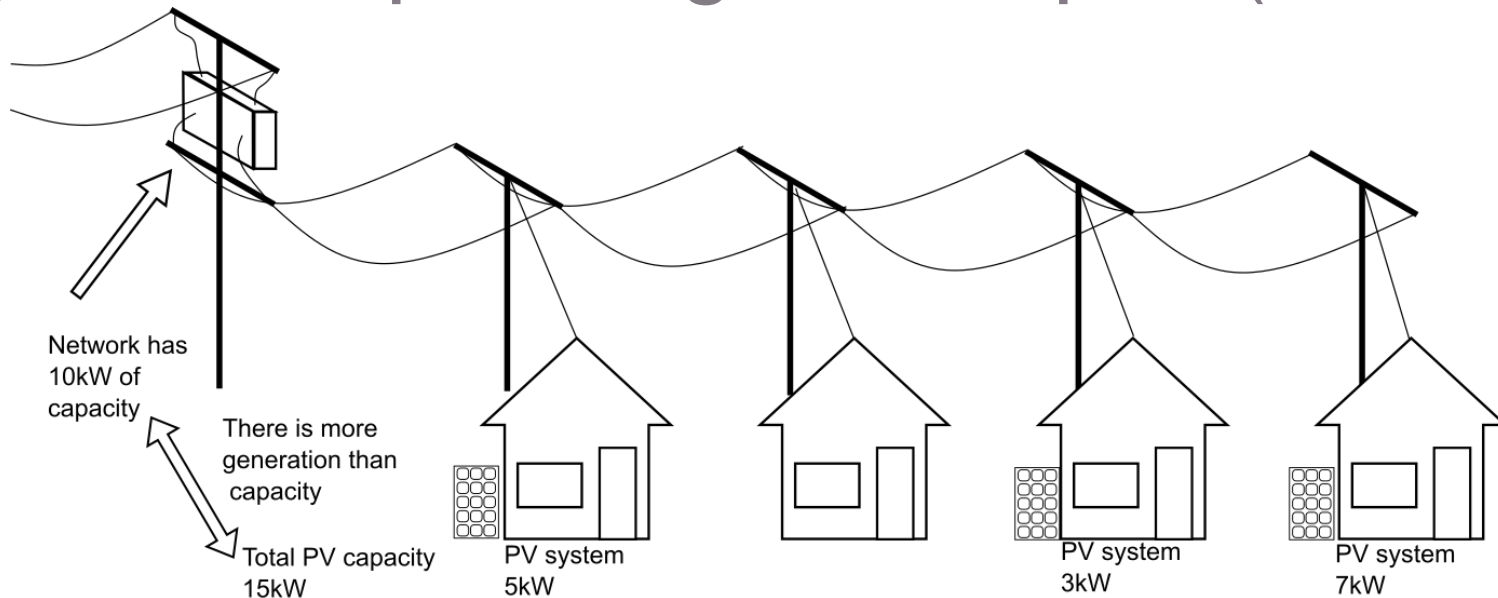


Fixed Operating Envelopes (FOEs)





Dynamic Operating Envelopes (DOEs)



DOE approach (example)

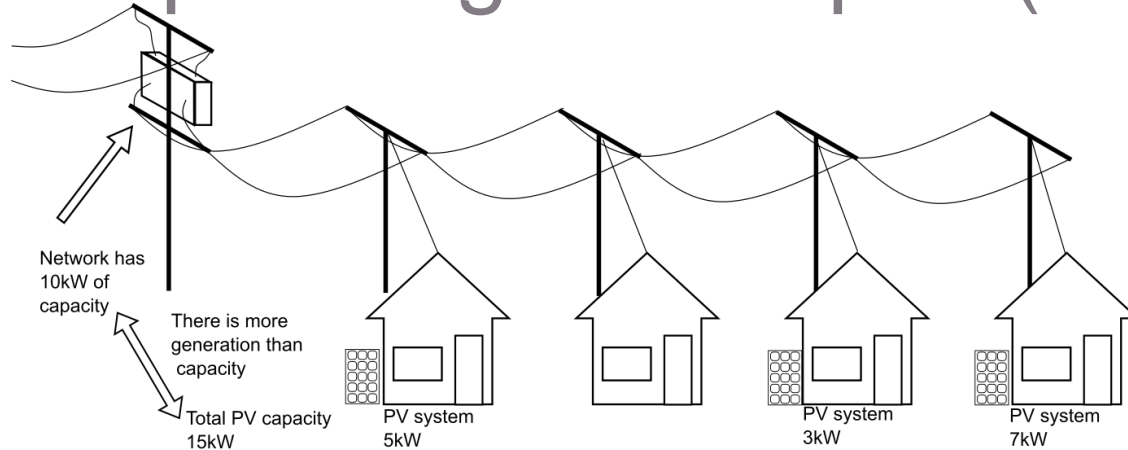
Each customer gets
 $10/15 = 2/3$ of their PV
System size in capacity

3.3kW capacity
allocated

2kW capacity
allocated

4.6kW capacity
allocated

Shaped Operating Envelopes (SOEs)



DOE approach (example)

Each customer gets
 $10/15 = 2/3$ of their PV
System size in capacity

3.3kW capacity
allocated

2kW capacity
allocated

4.6kW capacity
allocated

SOE approach

Step 2

Allocates capacity
to lowest bids

Step 1

Requests 4kW
Market bid \$1

Requests 3kW
Market bid \$0.50

Requests 5kW
Market bid \$1.50

⇒

4kW capacity
allocated

3kW capacity
allocated

3kW capacity
allocated

Summary

Fixed operating envelopes (FOEs)

Limiting what can connect to the network to ensure capacity limits are not breached

Dynamic Operating Envelopes (DOEs)

Allocating capacity in real time without a view of consumer's capacity needs

Shaped operating Envelopes (SOEs)

Allocating capacity in real time with a view of consumer's capacity needs as communicated by aggregators



Moving to breakouts

- Three groups
- 30 minutes in breakouts to discuss your perspectives on the themes we presented
- Then we finish

Finishing

Thank you for your contribution today!

- We will share outcomes with you
- Don't forget your vouchers on the way out



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Energy Storage



BSGIP
Devices, Optimisation
and Control



**Battery Storage and
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BSGIP
Data and Analytics



BSGIP
Regulation, Markets
and Models