Centre for Energy and Environmental Markets

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Residential batteries, network peaks, etc

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Working Together Lunch, Essential Energy

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Aims

1. Assess the BESS's ability to load-follow
2. Assess the BESS's ability to reduce customer demand during 2 network-wide peaks and 4 ZS peaks

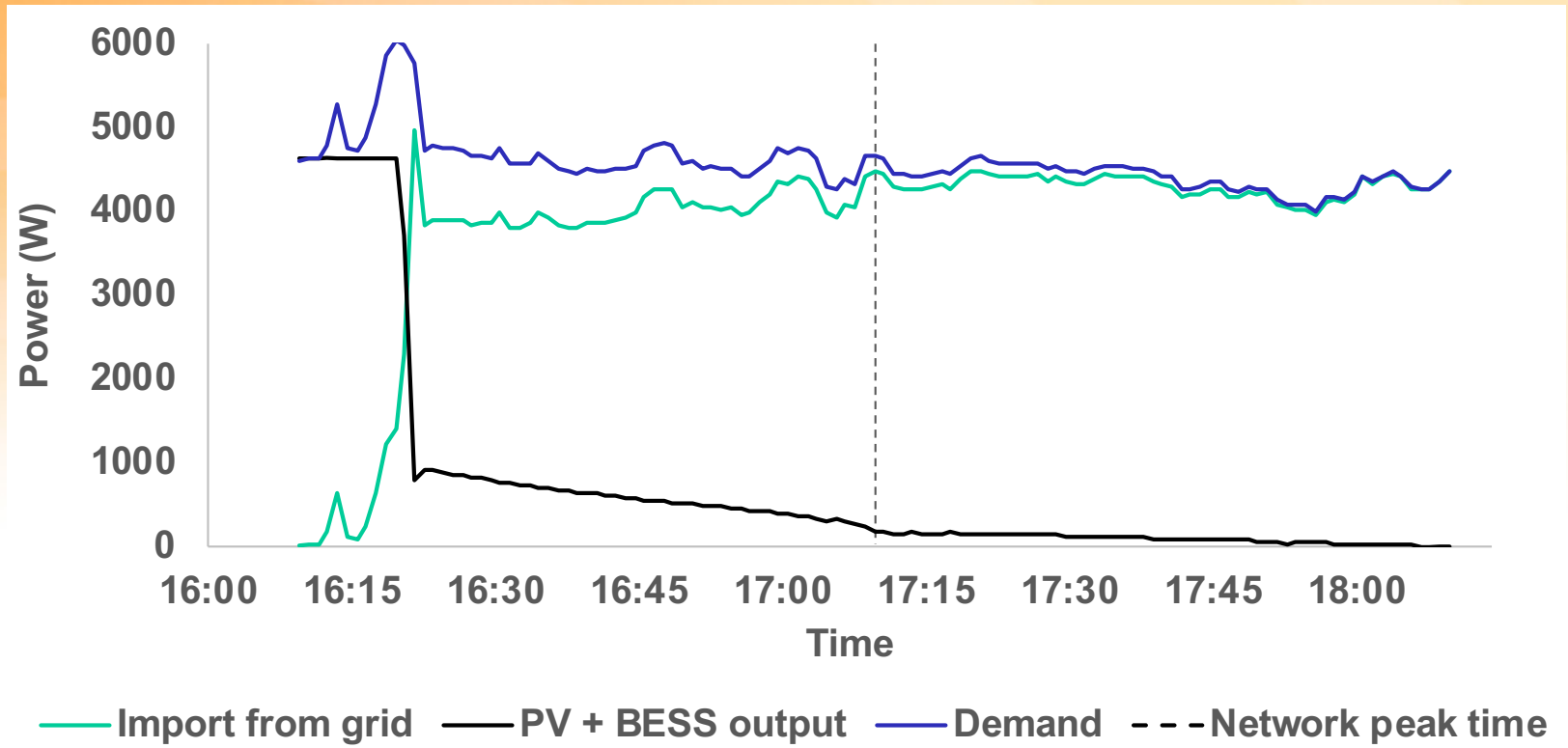
Method

- 1 min data from 15 residential BESS, 6 AC-coupled, 9 DC-coupled
- All on flat network tariff, retail tariff unknown
- PV ranges from 3kW to 6kW, BESS ranges from 2kW to 5 kW (and 5.3kWh to 12.8kWh)
- Two network peak days Wed 18 Jan 2017 and Sun 12 Feb 2017, both at 5:10pm.
- ZS peak days – assessed 4 highest peaks for each ZS.
- AC-coupled systems: PV generation was added to the BESS output, but only up to the BESS rated capacity
- DC-coupled systems: combined PV+BESS is limited by the BESS inverter

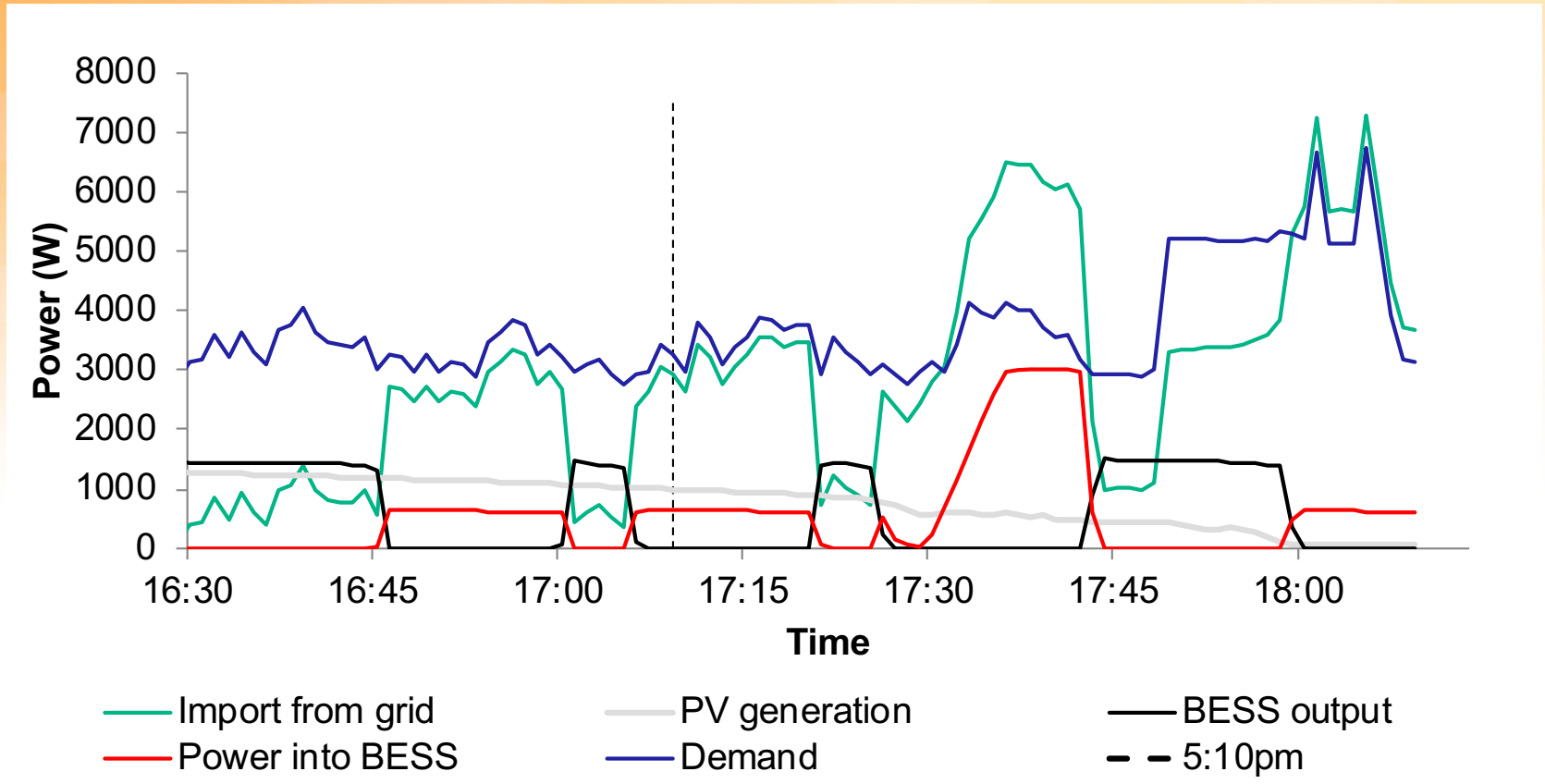
Network peak days: Outcomes

Number	Description	Percent
6	Depleted prior to peak	20%
5	Unorthodox behaviours	17%
4	No activity from BESS	13%
2	No data	7%
13	Load-following behaviour	43%

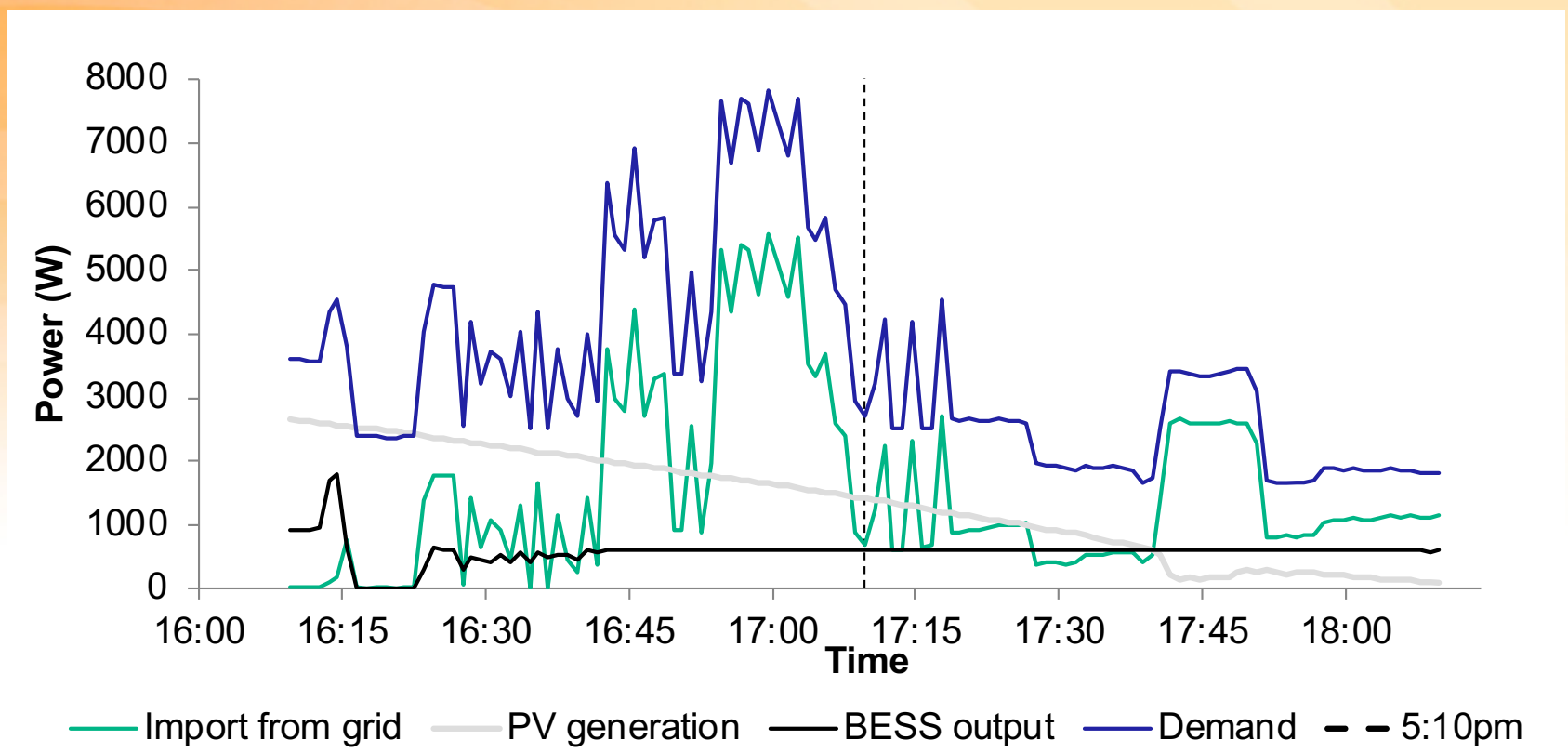
Depletion prior to the peak



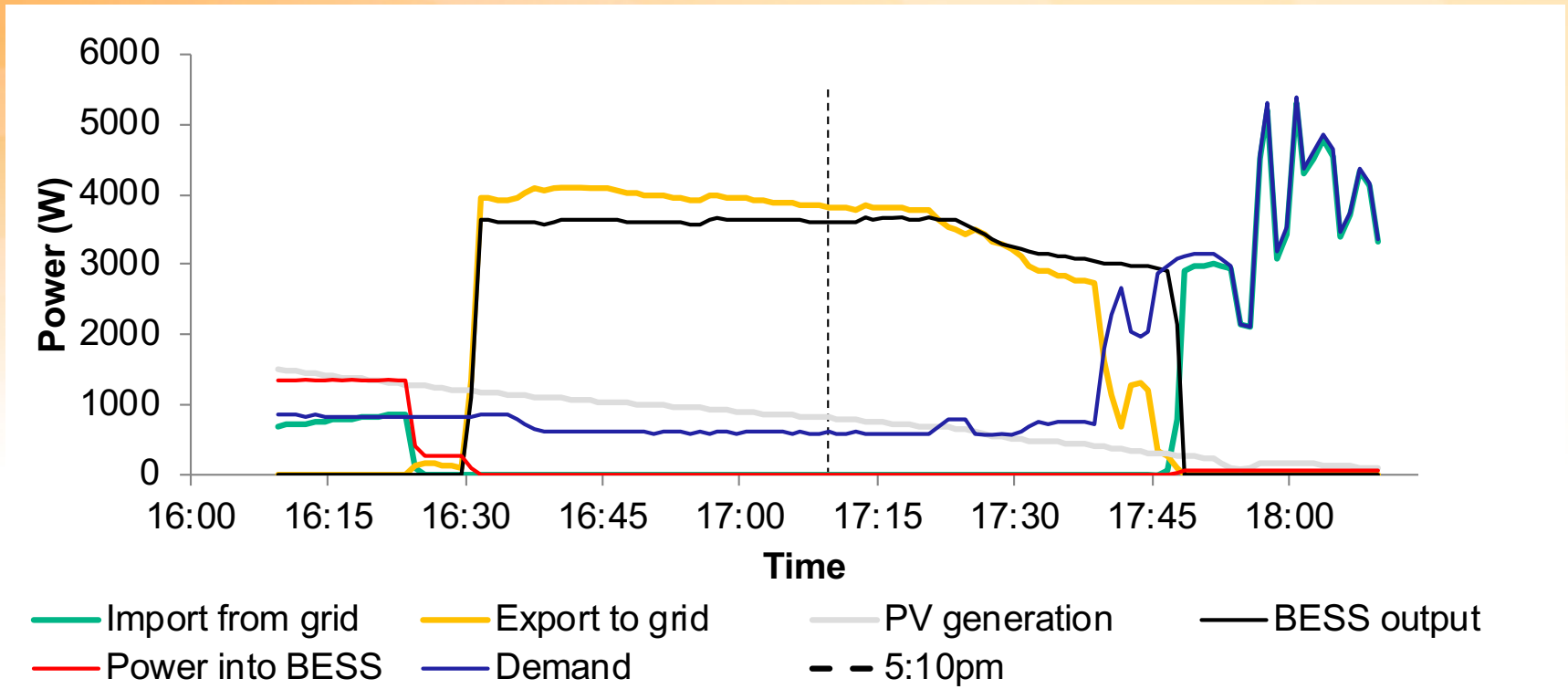
Unorthodox behaviour - 1



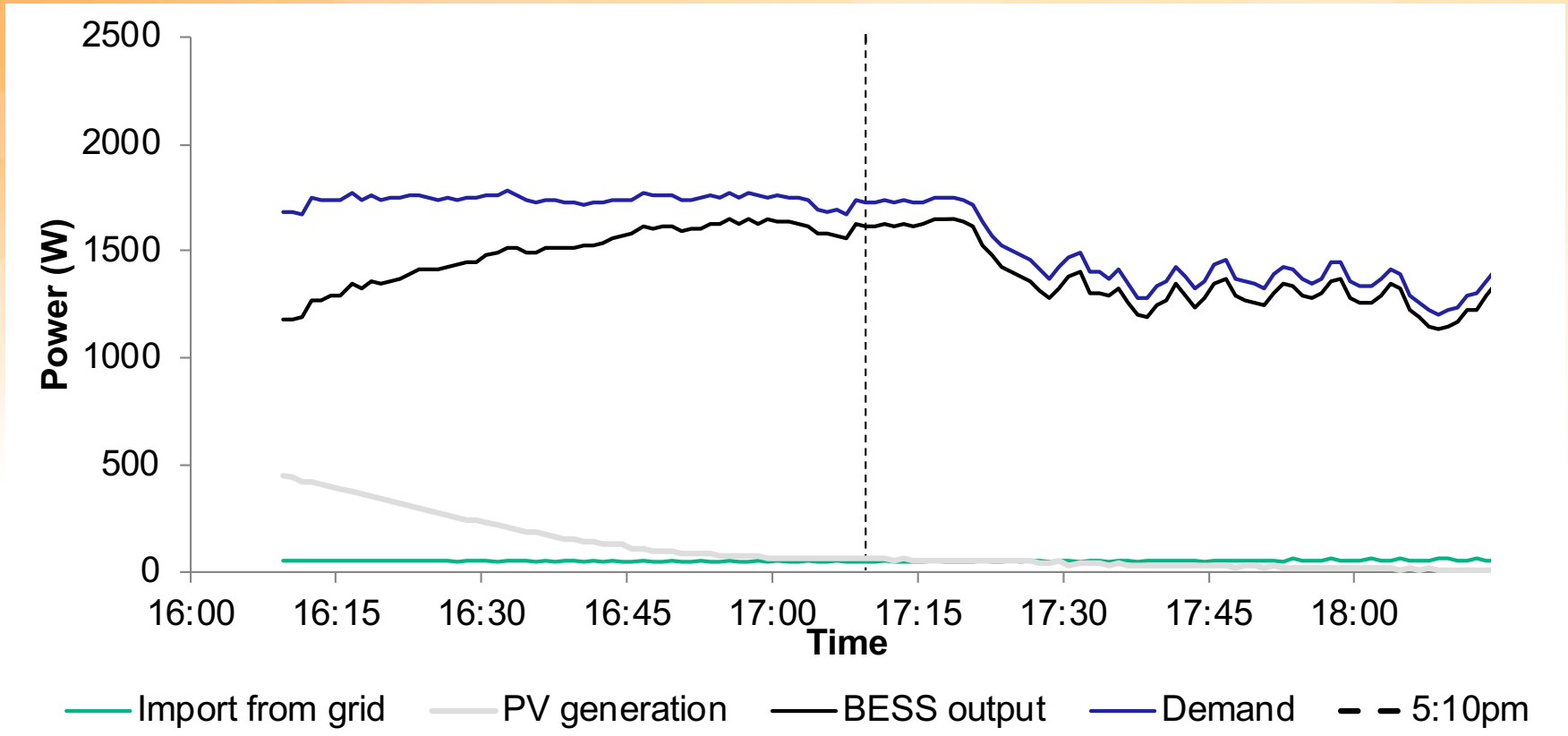
Unorthodox behaviour - 2



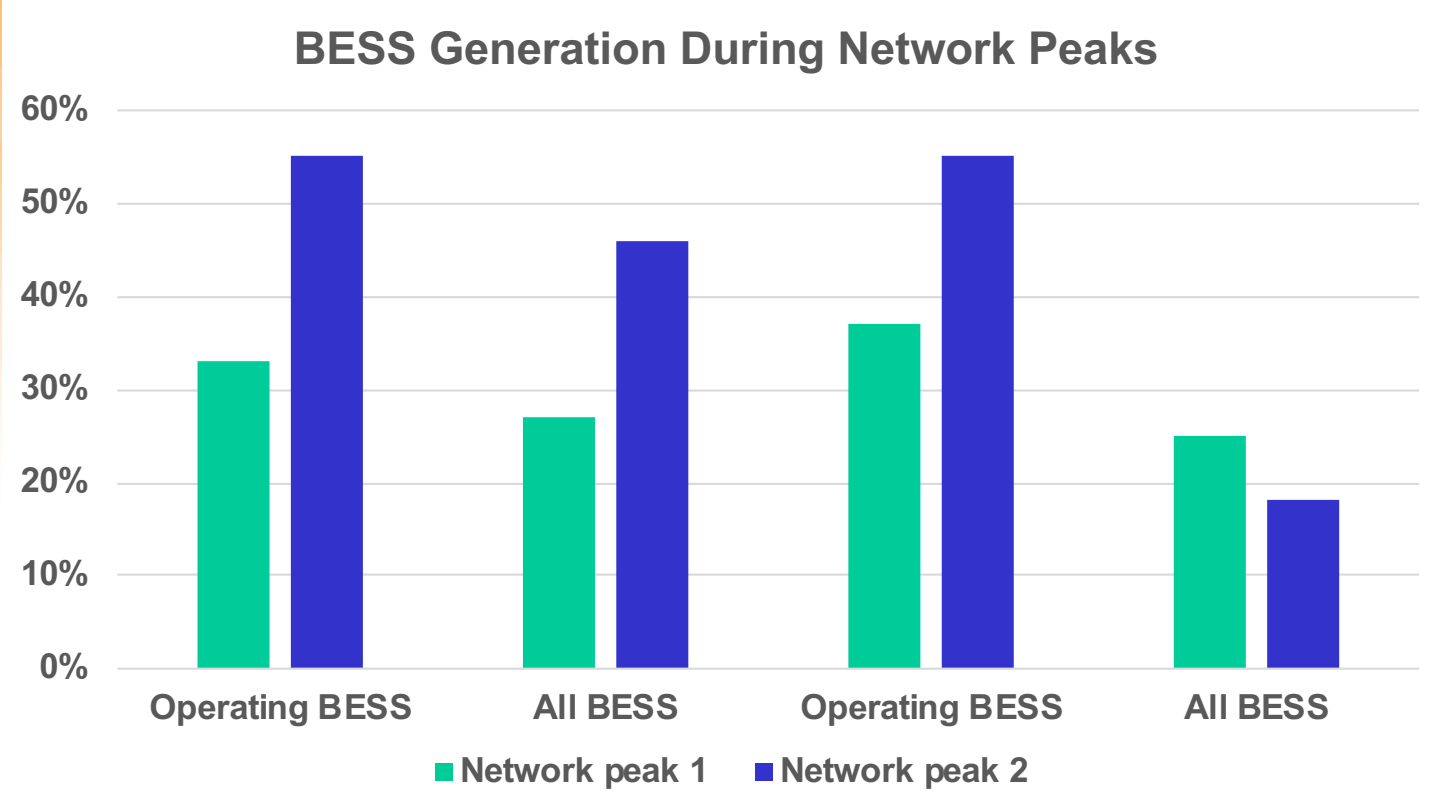
Unorthodox behaviour - 3



Load following (ish)



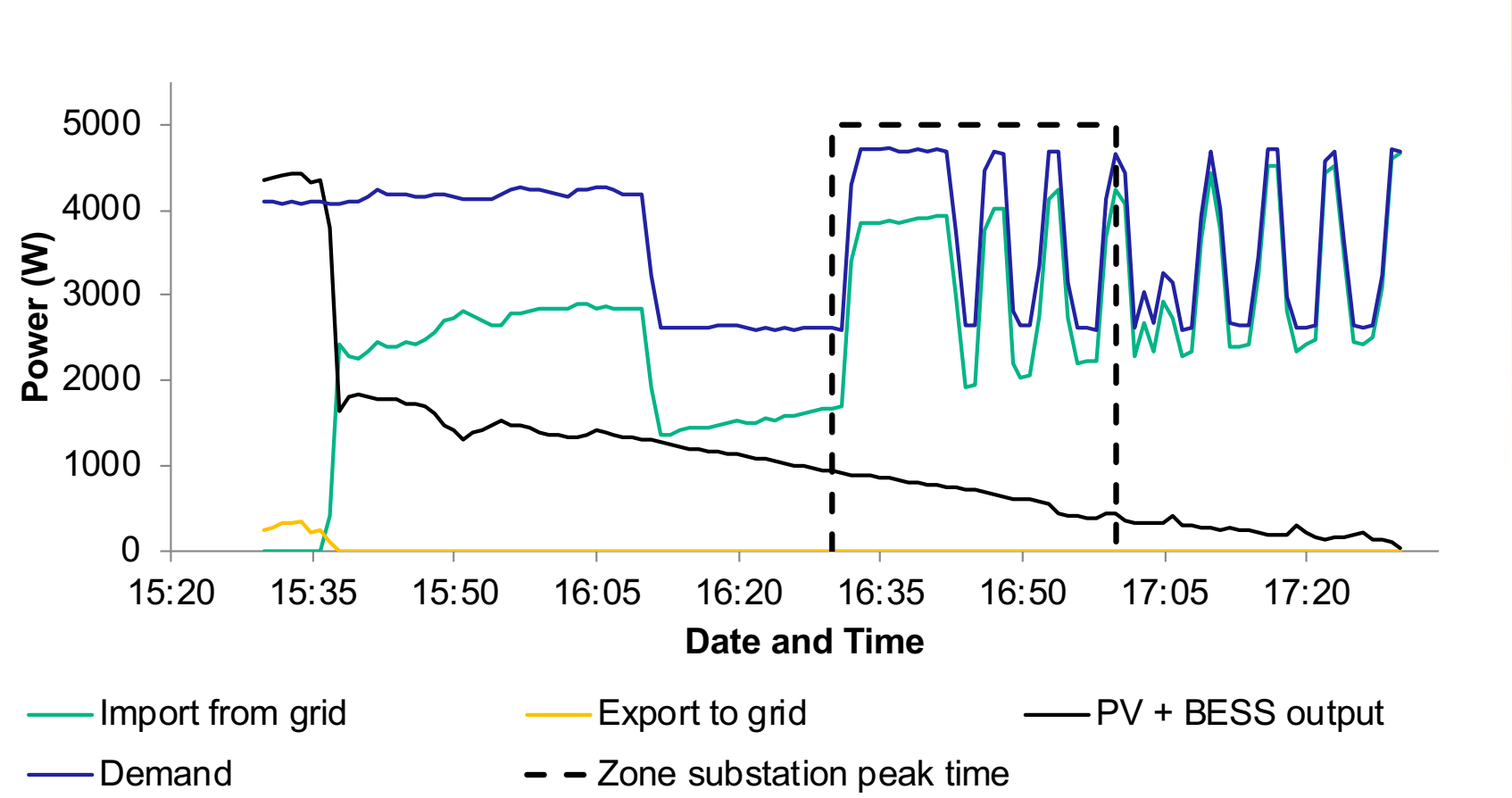
Average ability to reduce network peaks



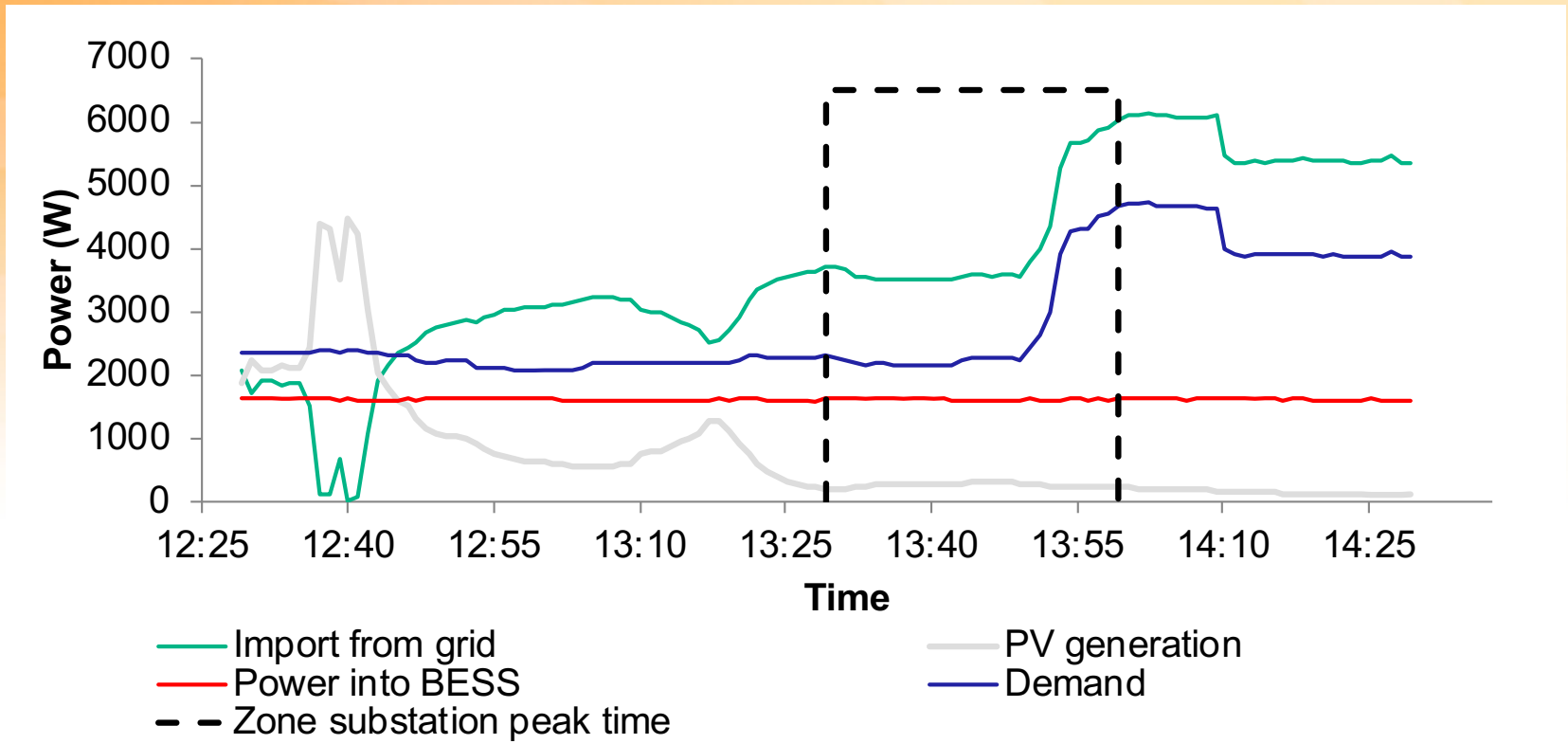
ZS peak days: Outcomes

Number	Description	Percent
17	Depleted prior to peak	28%
2	Unorthodox behaviours	3%
6	No activity from BESS	10%
4	No data	6%
31	Load-following behaviour	52%

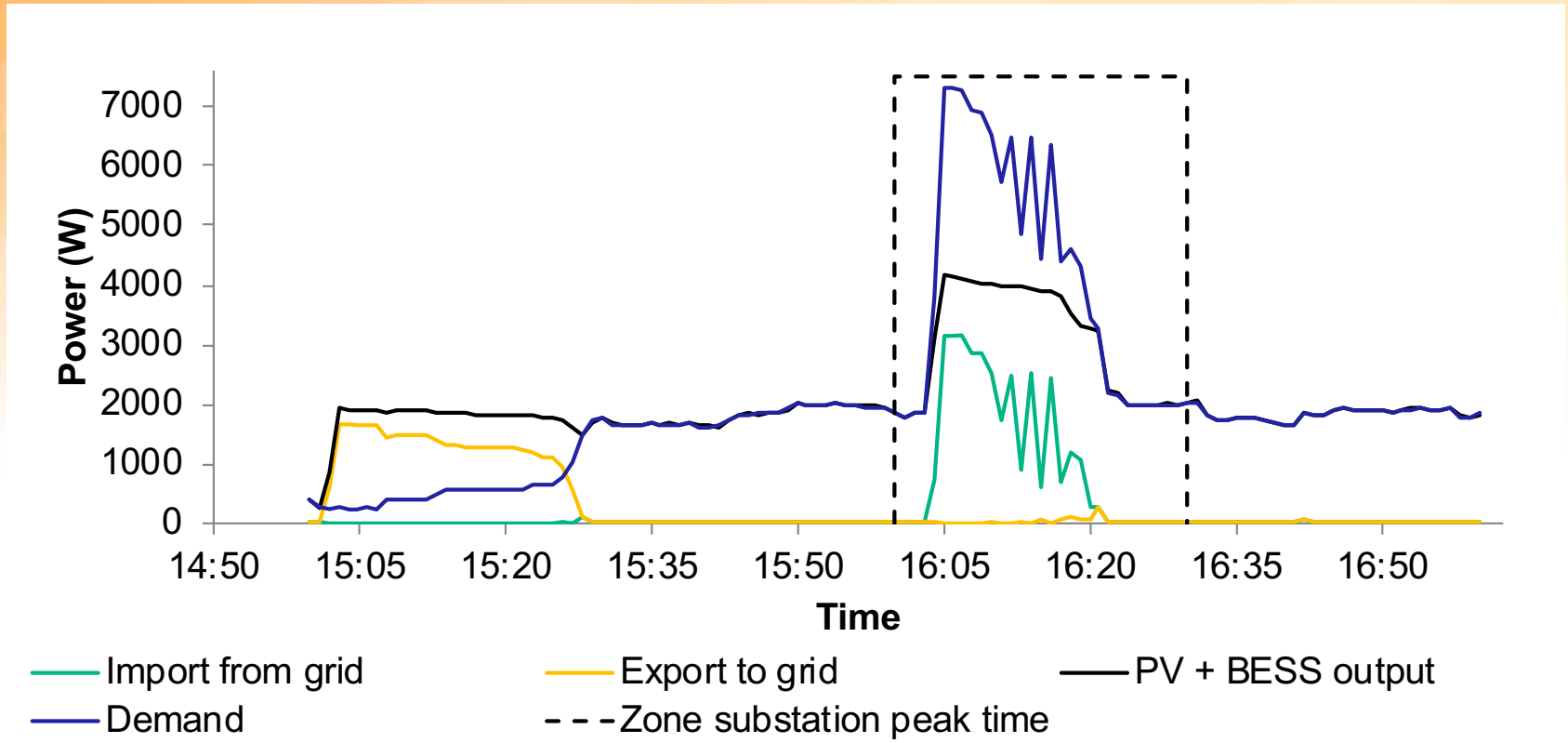
Depletion prior to the peak



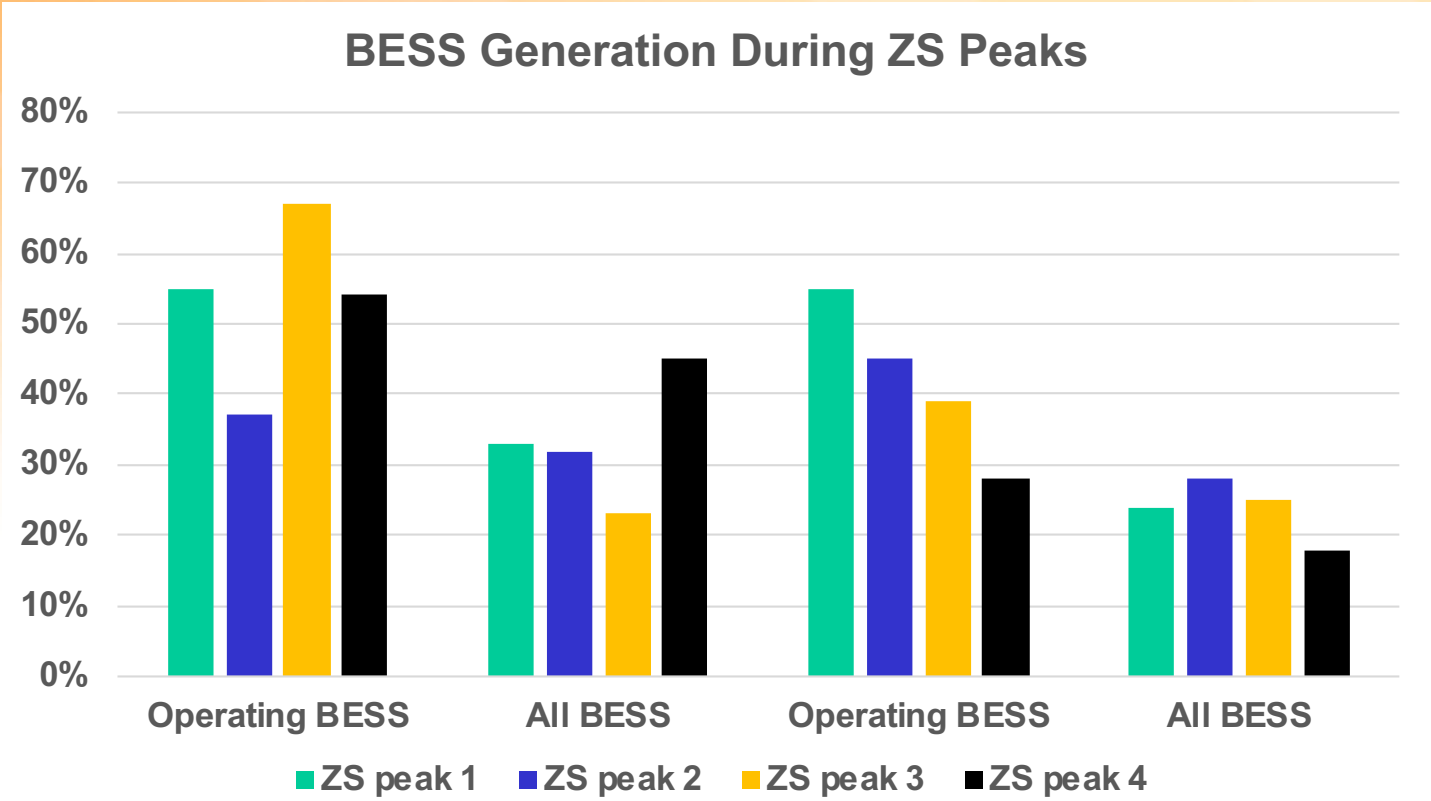
Unorthodox behaviour



Load following



Average ability to reduce ZS peaks



Conclusions

1. Batteries are not necessarily doing what you think they are!
2. Even when not part of a VPP, on average about half their capacity was discharging during network peaks, which could reduce the need for such VPPs
3. If they are part of a VPP, and are not charged prior to a VPP event, on average about half their capacity was still available to discharge and so provide network support

Future work

1. Assess BESS's ability to reduce PV exports
2. Look into cost impacts of all this
3. Look for better datasets!

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Thank you… and *questions*

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