



Aggregation in the NEM

Paul Troughton

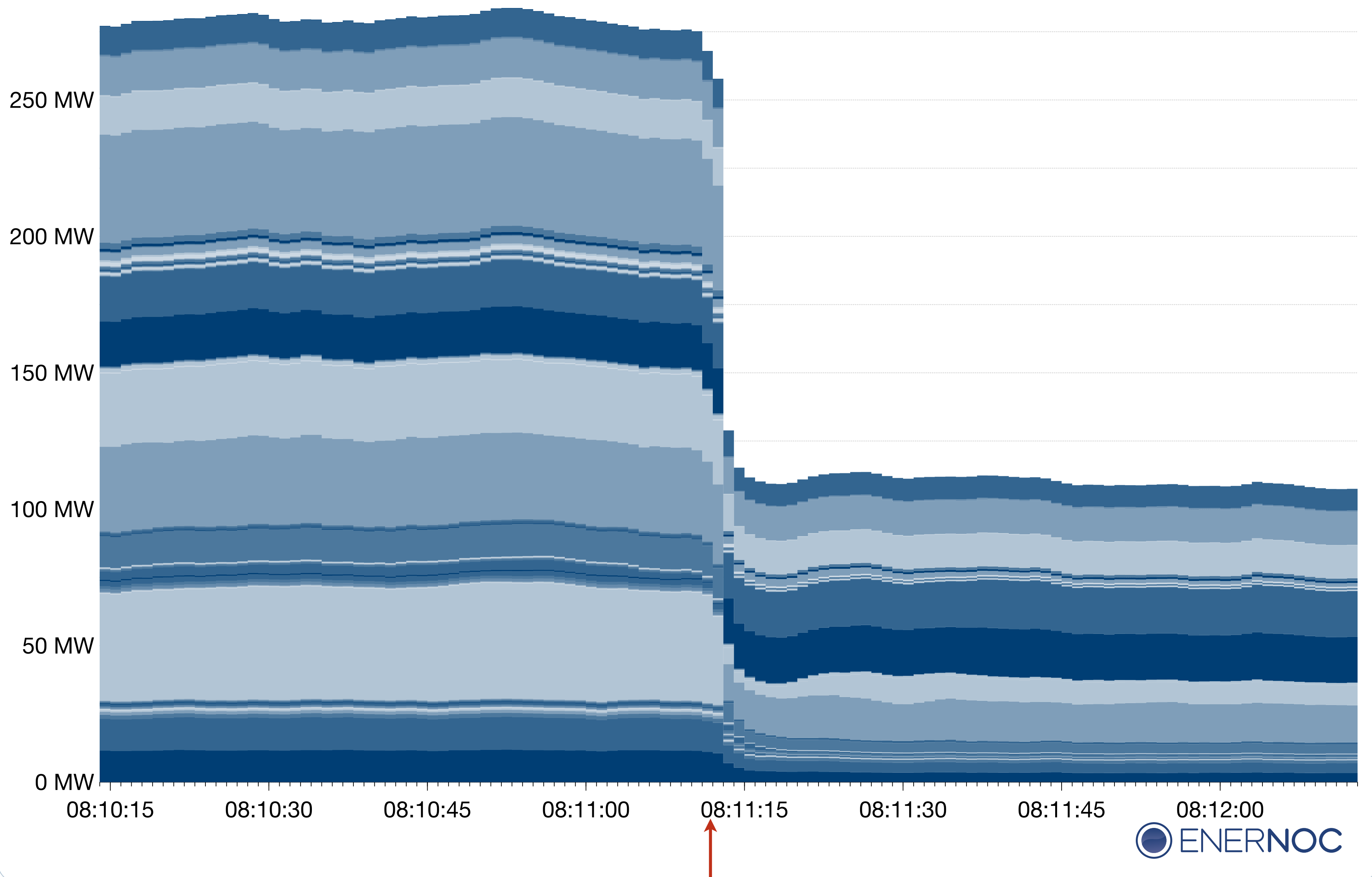
AEMC workshop on aggregation of ancillary services loads

27 Apr 2012

Under-frequency event in New Zealand

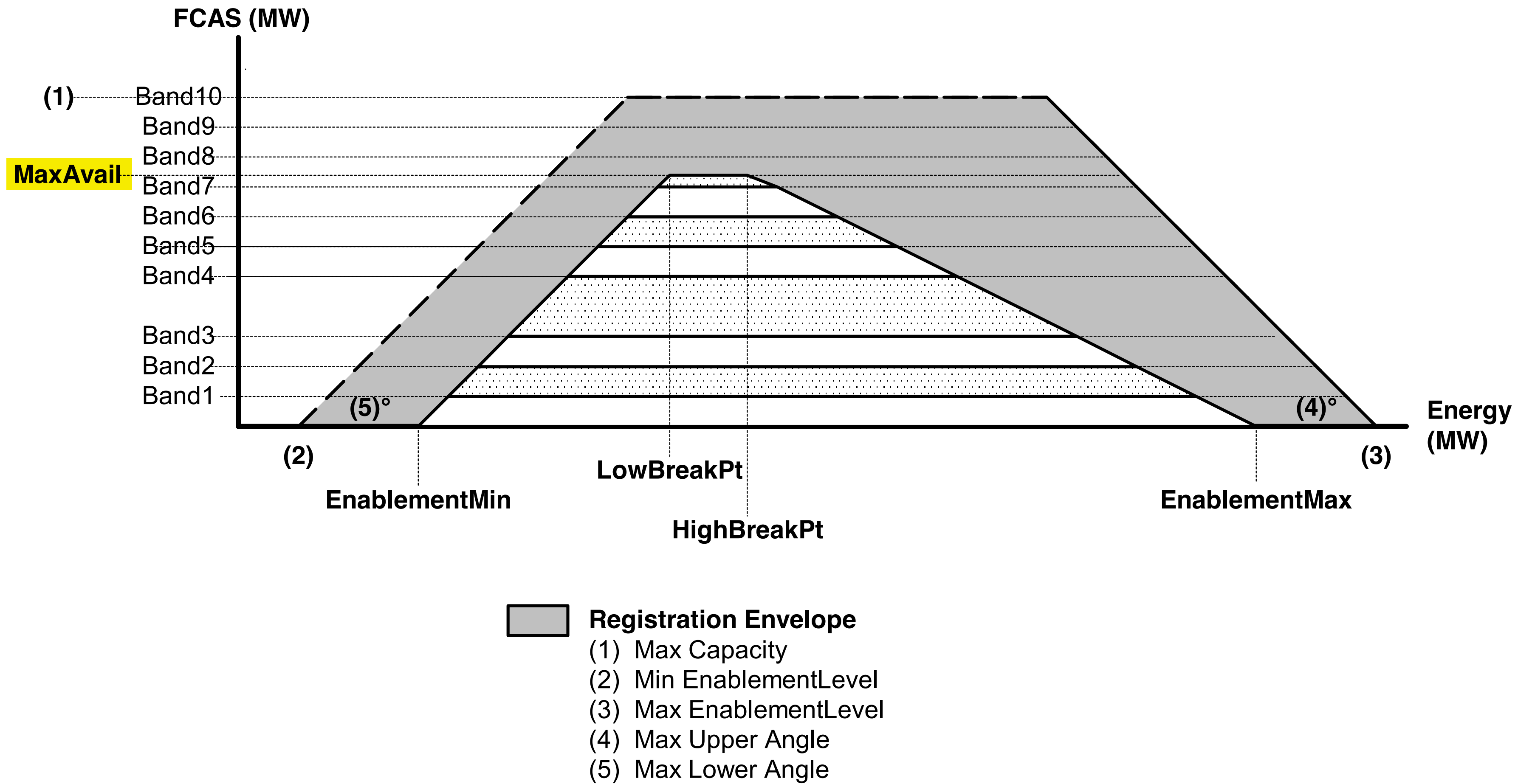


Under-frequency event in New Zealand



Data: 1 second meter data from 79 devices which responded to North Island UFE on 9 Dec 2011.

It's not that difficult



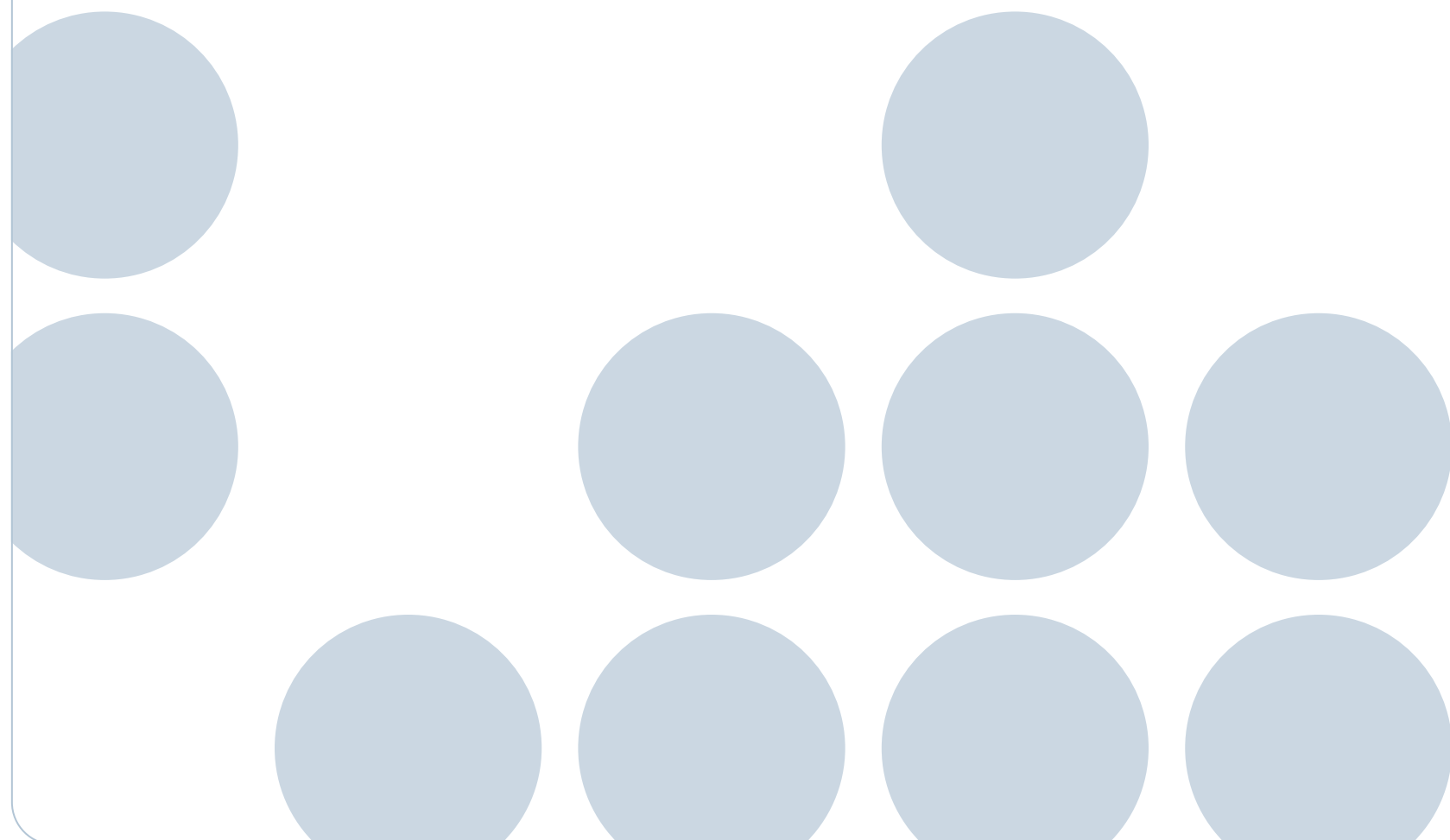
Contingency FCAS from non-scheduled loads

- Trapezium not relevant
- SCADA not required by AEMO
- No interaction with market meter
- No interaction with MSATS
- Manual processes:
 - Approval & classification/registration of new facilities
 - Post-event performance verification

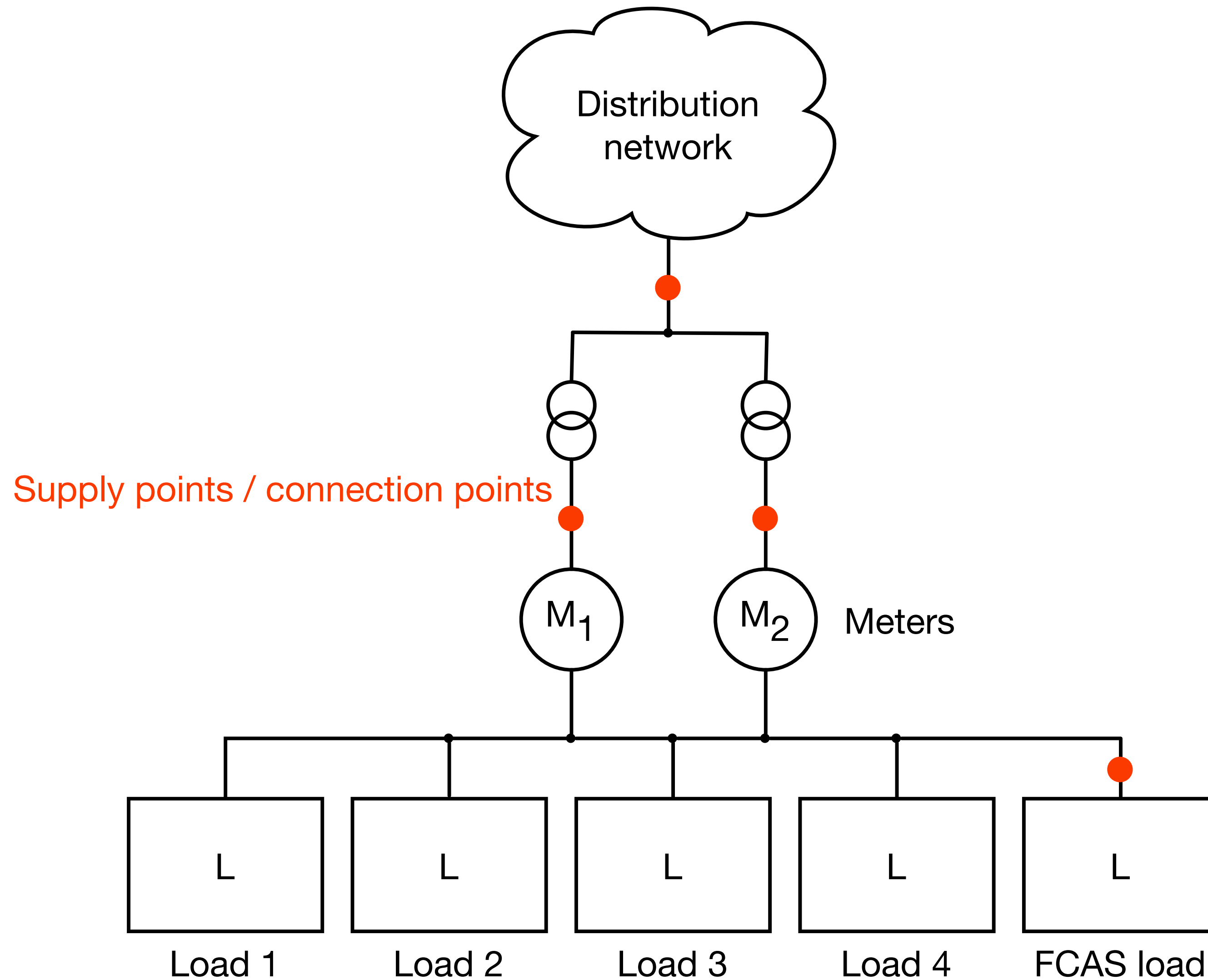
What is required?

- A market participant able to submit bids
- A market participant able to be paid by the market
- There's no reason this needs to be a Customer or a Generator
- We could have an Aggregator participant

Different participants are responsible for different services at the one connection point



Lesson from NZ: meter close to load



Lessons from NZ

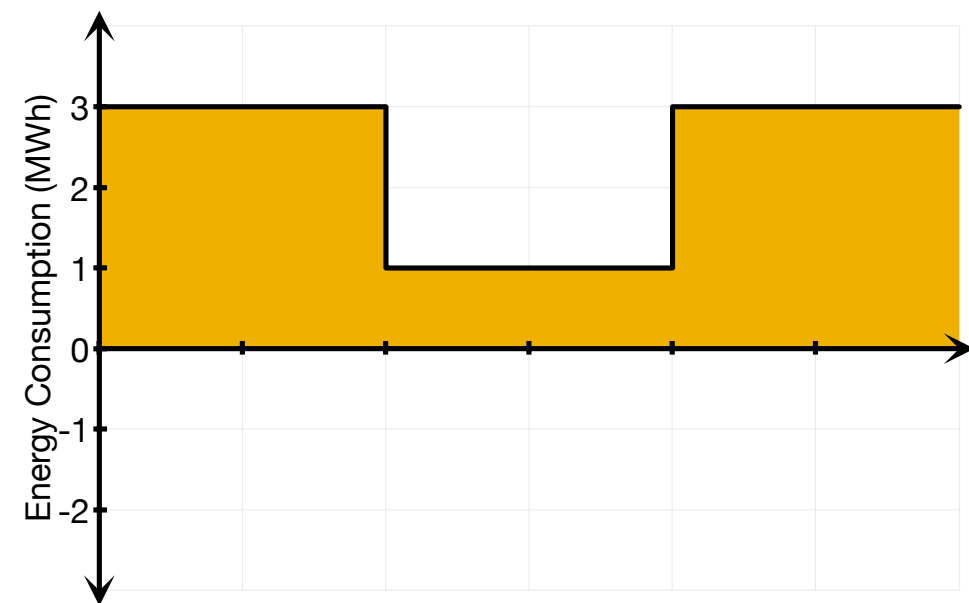
- Meter close to controlled load
- 1 second meter data suffices for verification

FCAS programmes rarely work alone

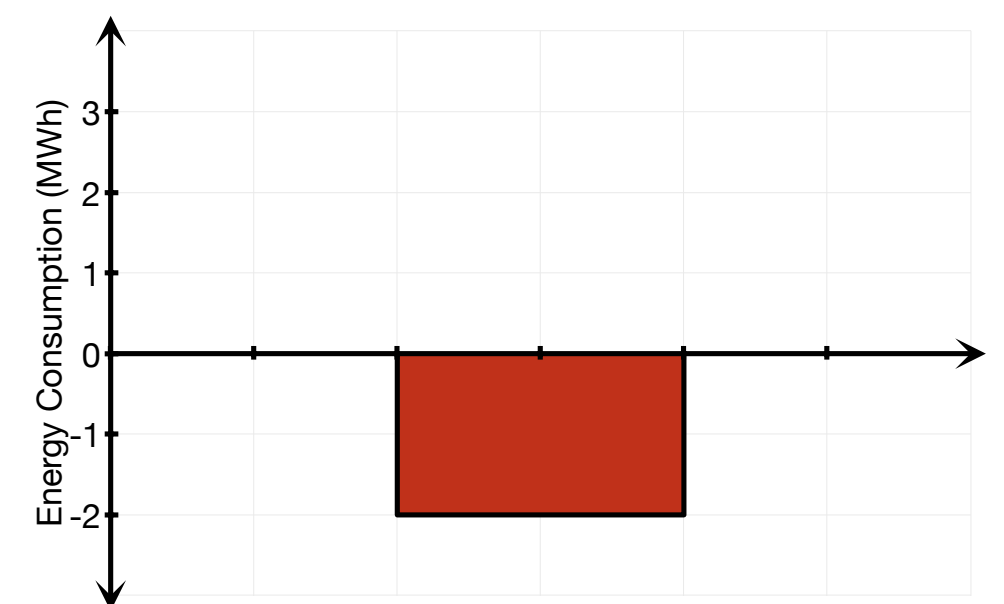
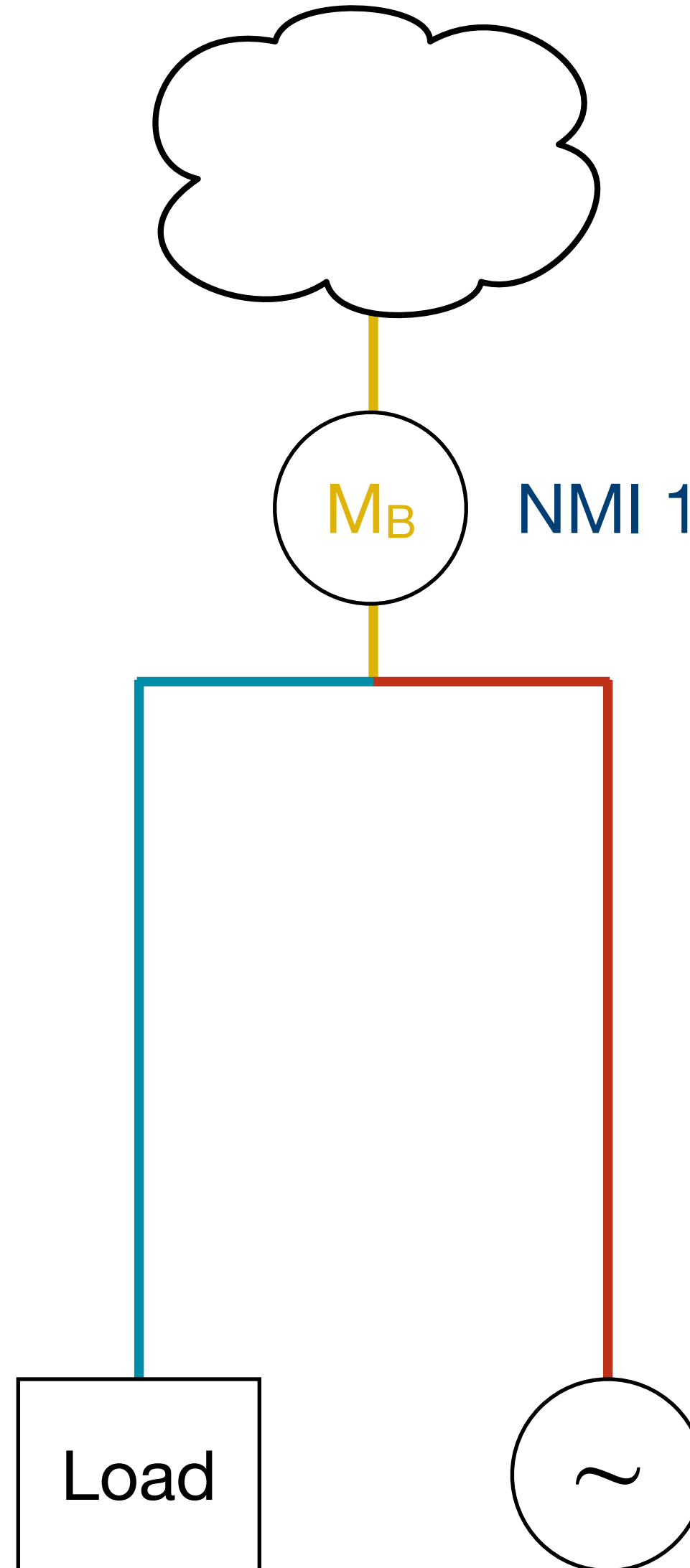
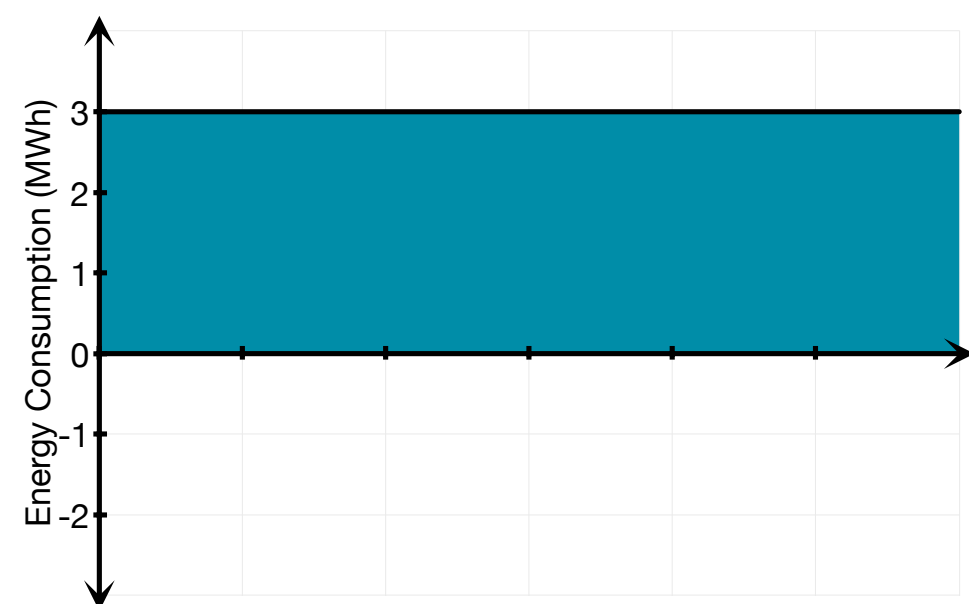
- Enablement is expensive
(especially if you over-specify the measurement requirements)
- Ancillary services prices are usually low
(NZ and Alberta are exceptions)
- FCAS is typically an add-on to an energy DR programme

Sale of demand response in the spot market

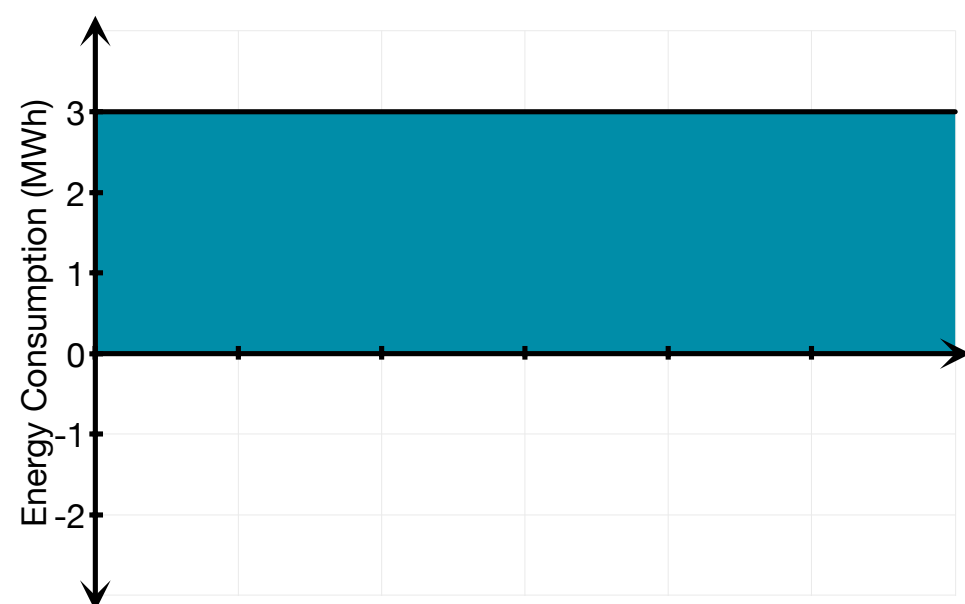
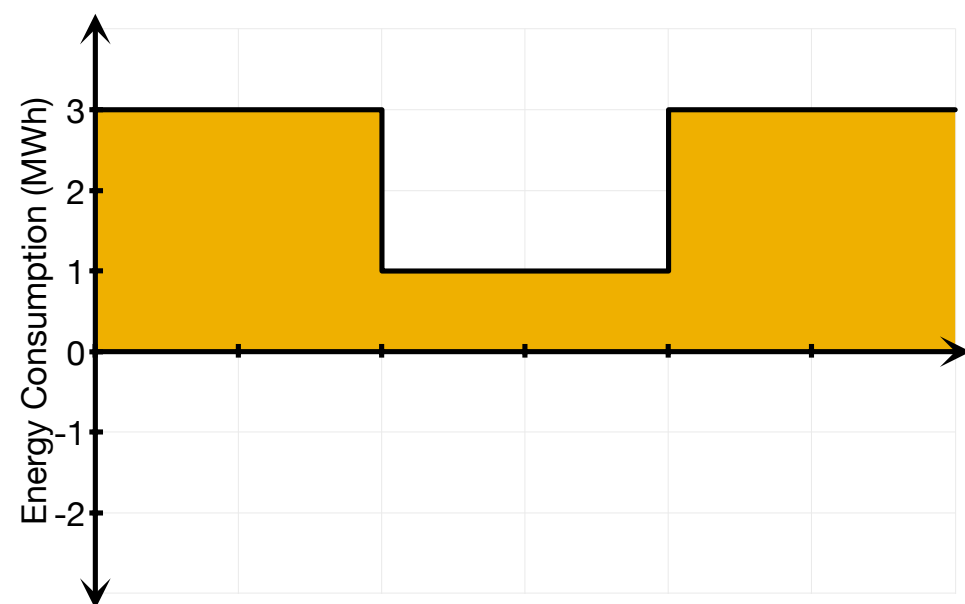
Embedded generator (not spot market exposed)



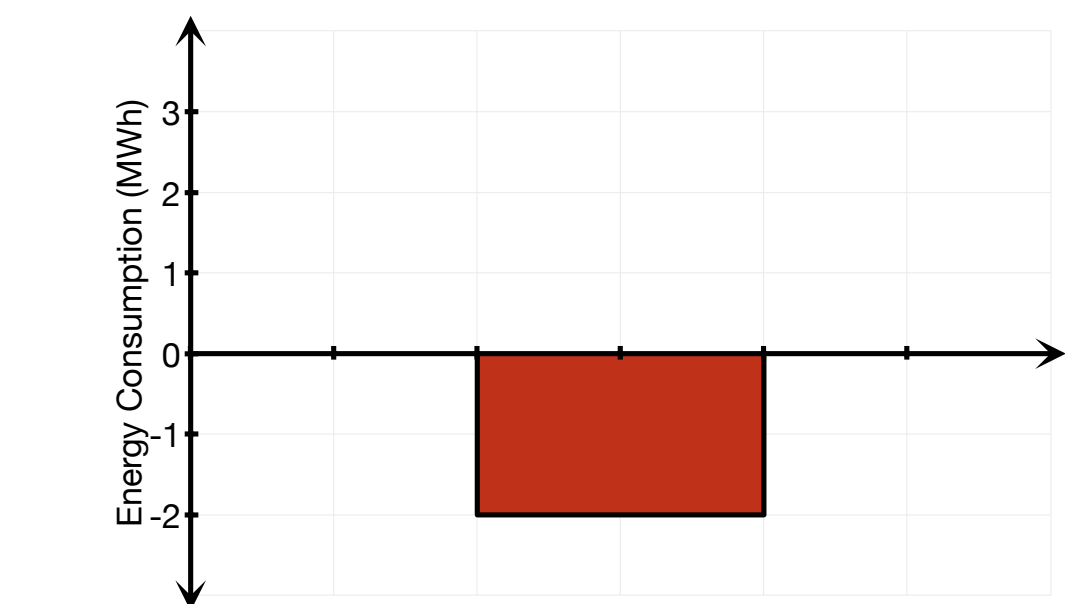
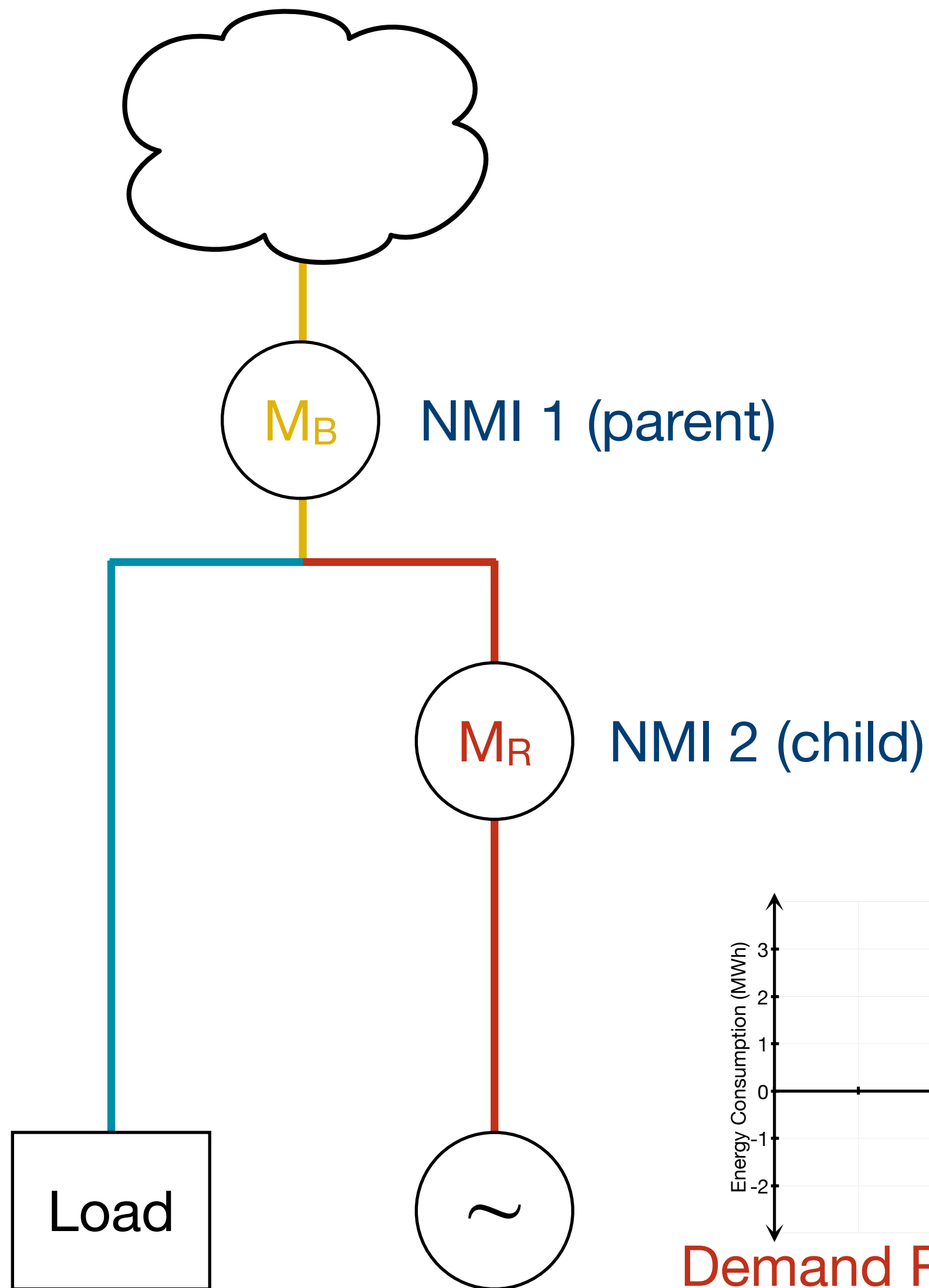
Retail FRMP



Embedded market generator (already happens)

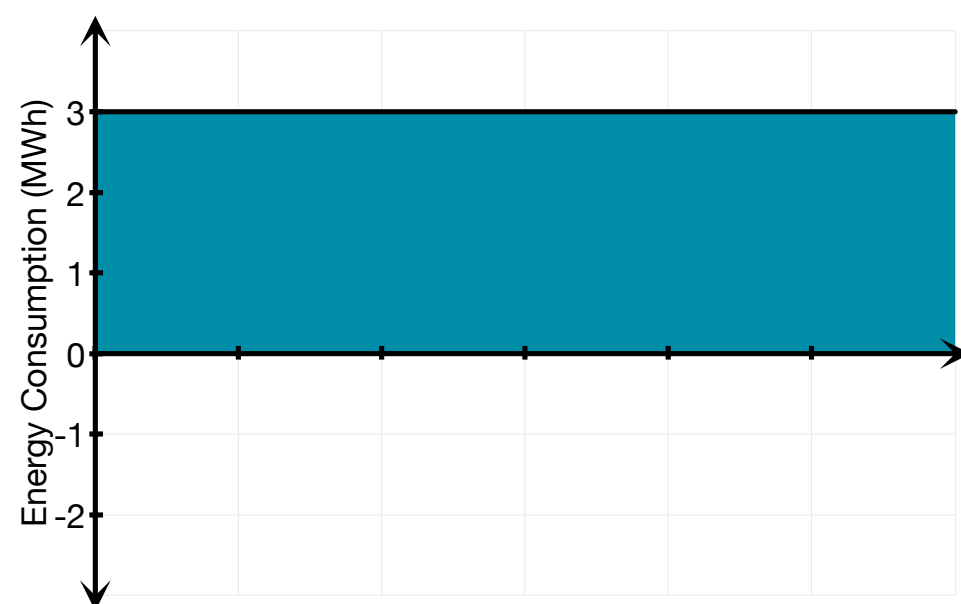
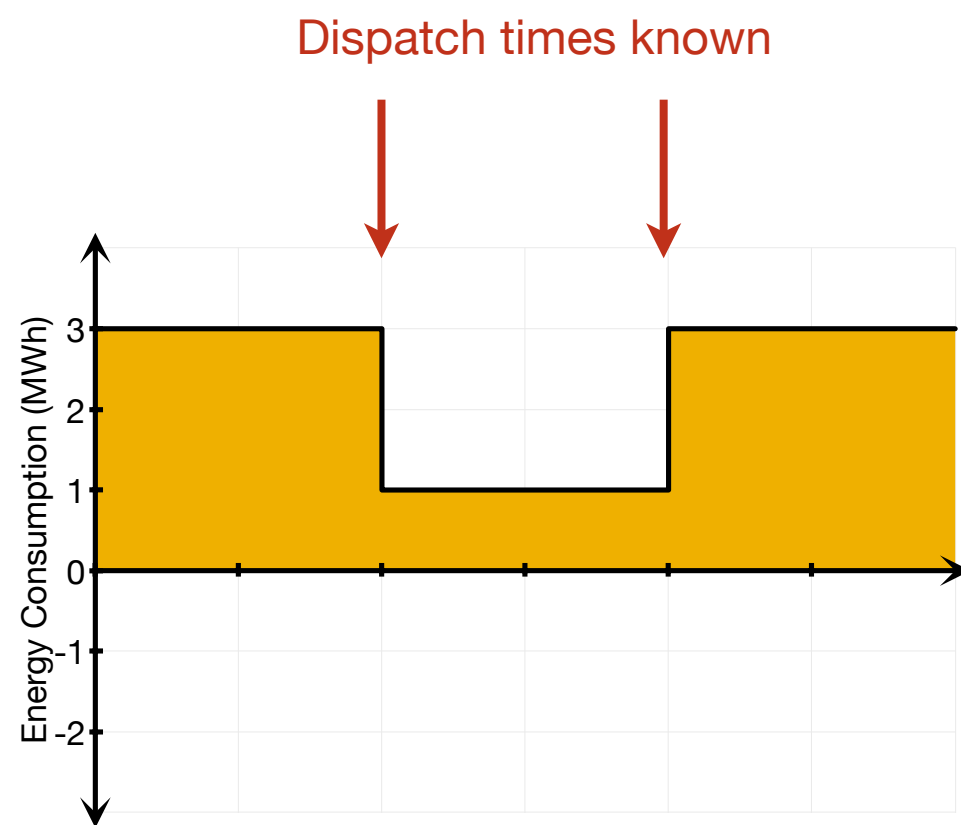


Retail FRMP

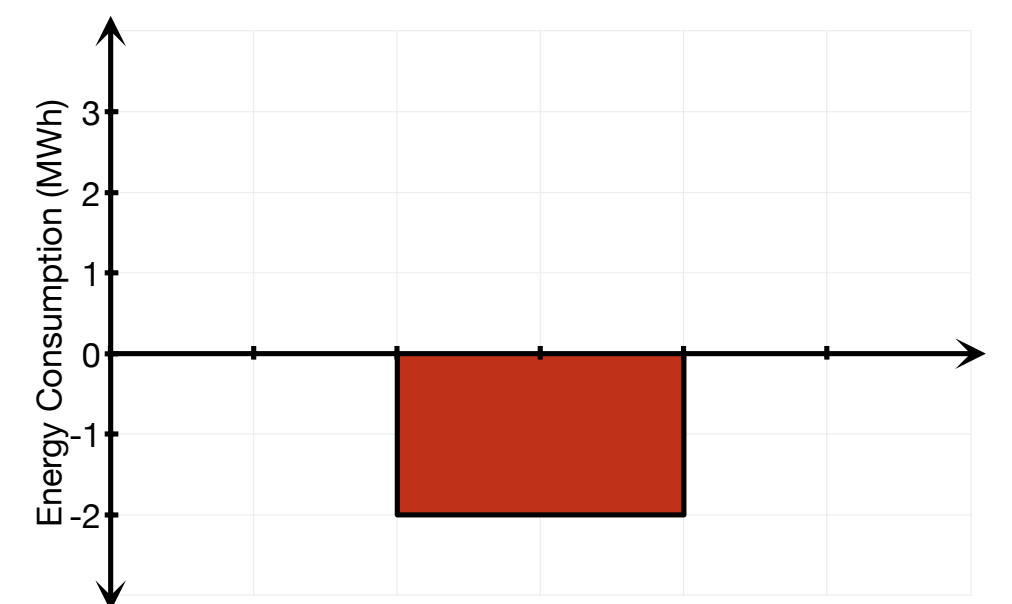
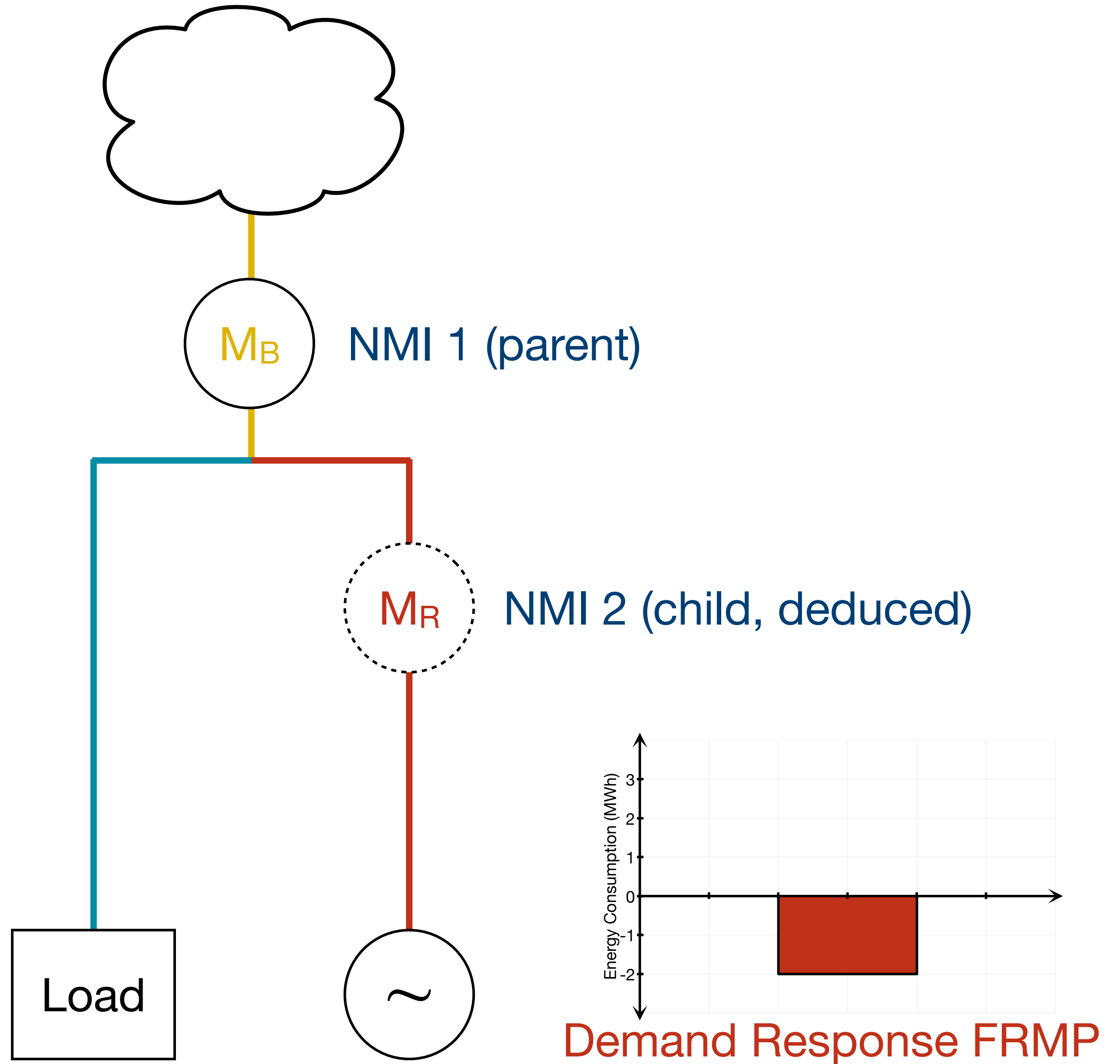


Demand Response FRMP

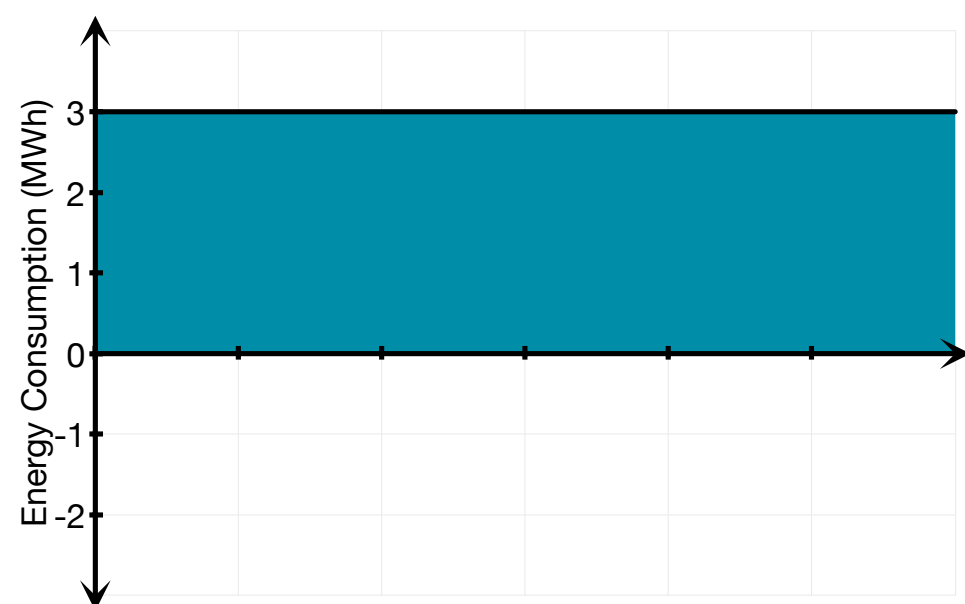
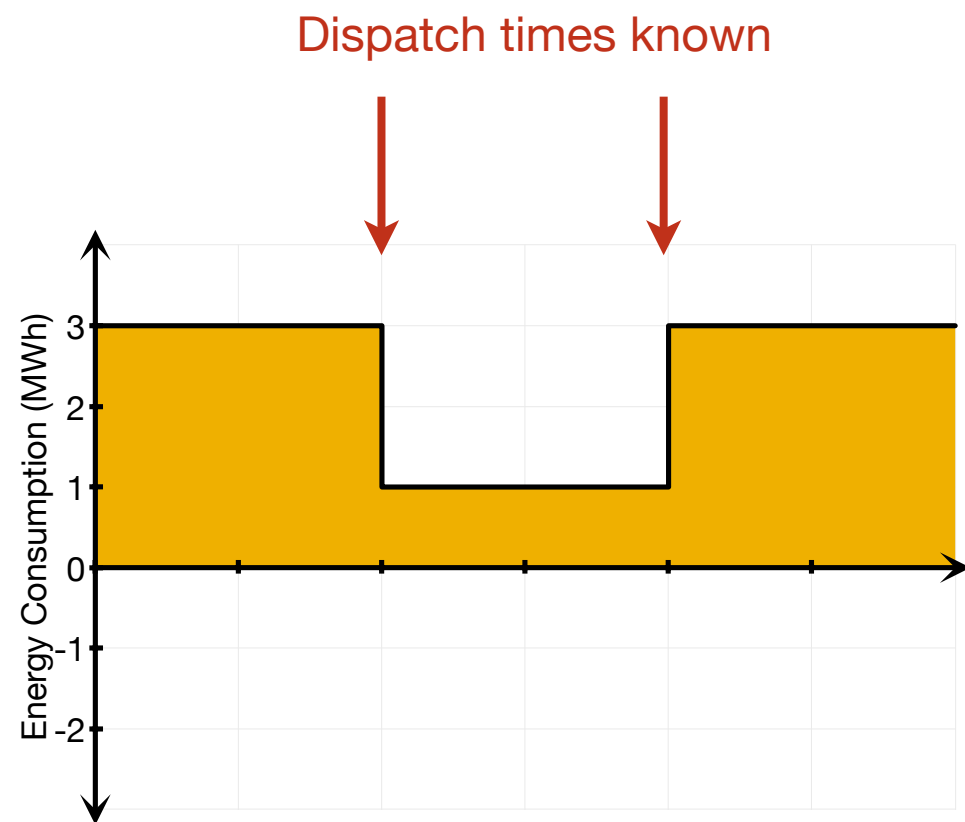
Do we need the generator meter?



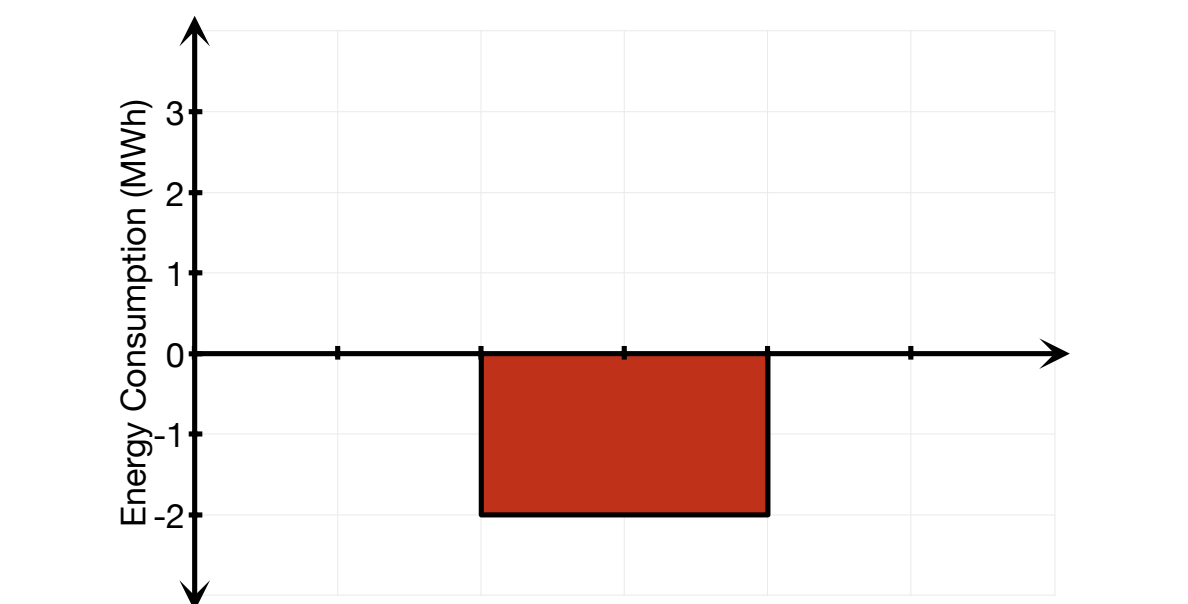
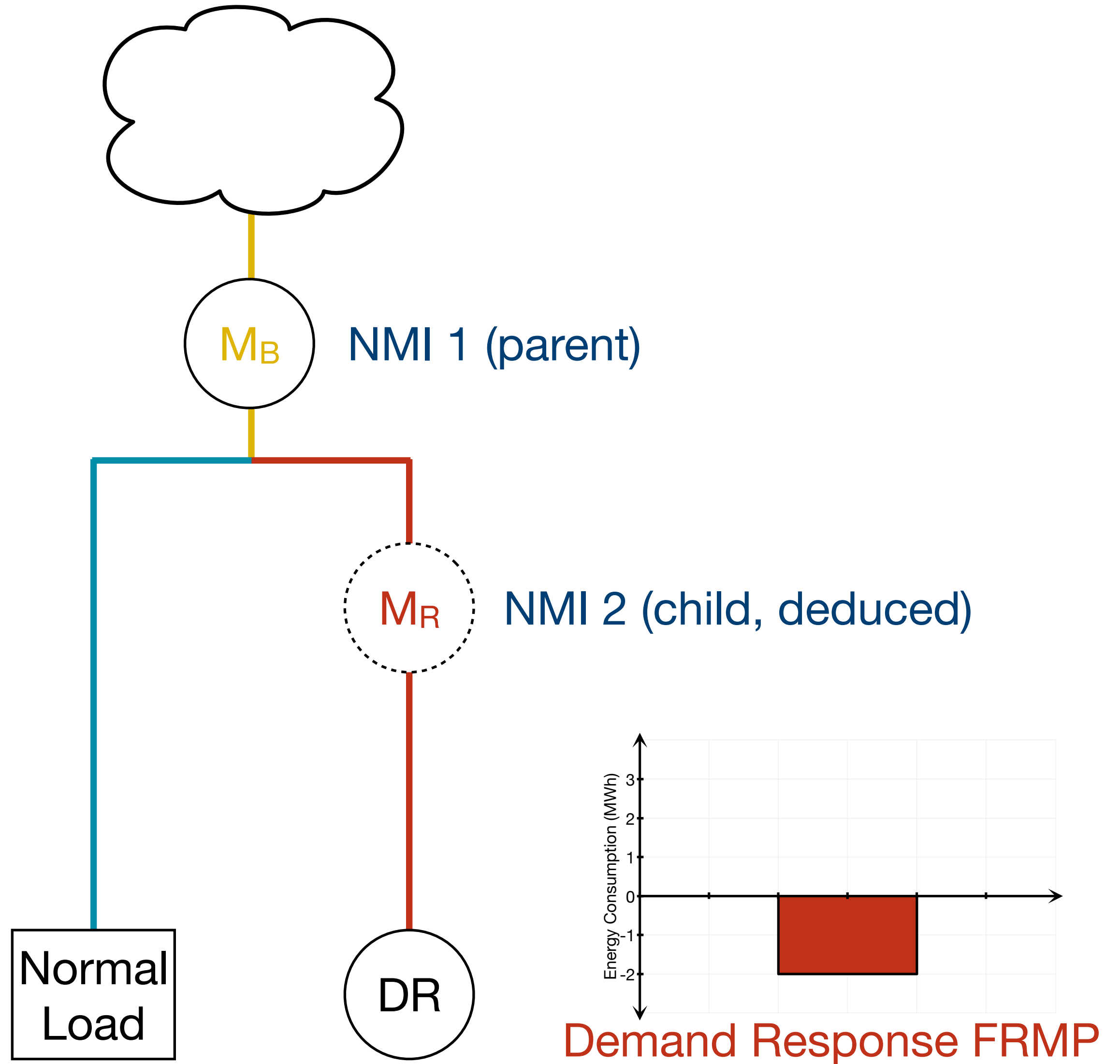
Retail FRMP



Do we care whether the resource is a generator?

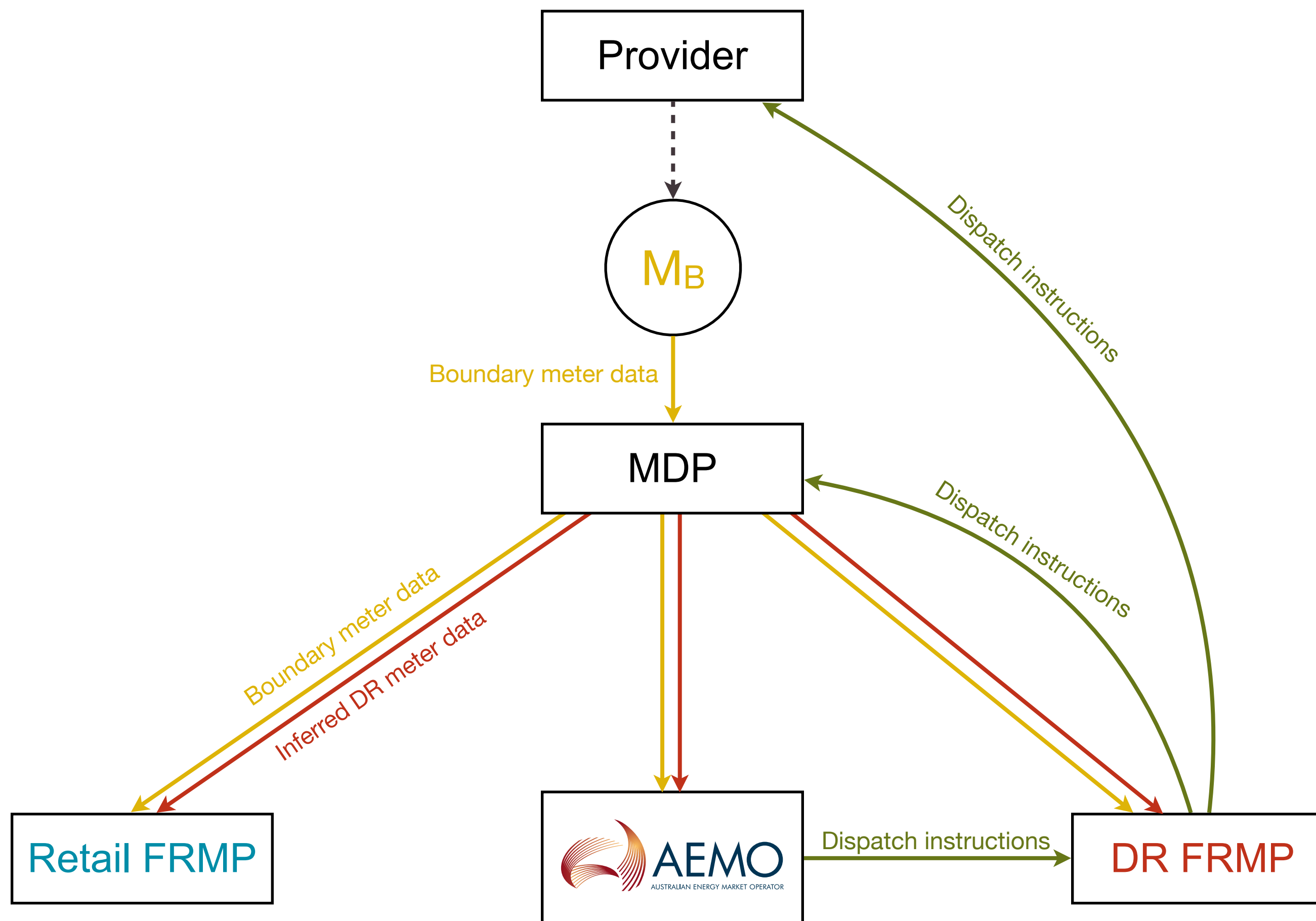


Retail FRMP

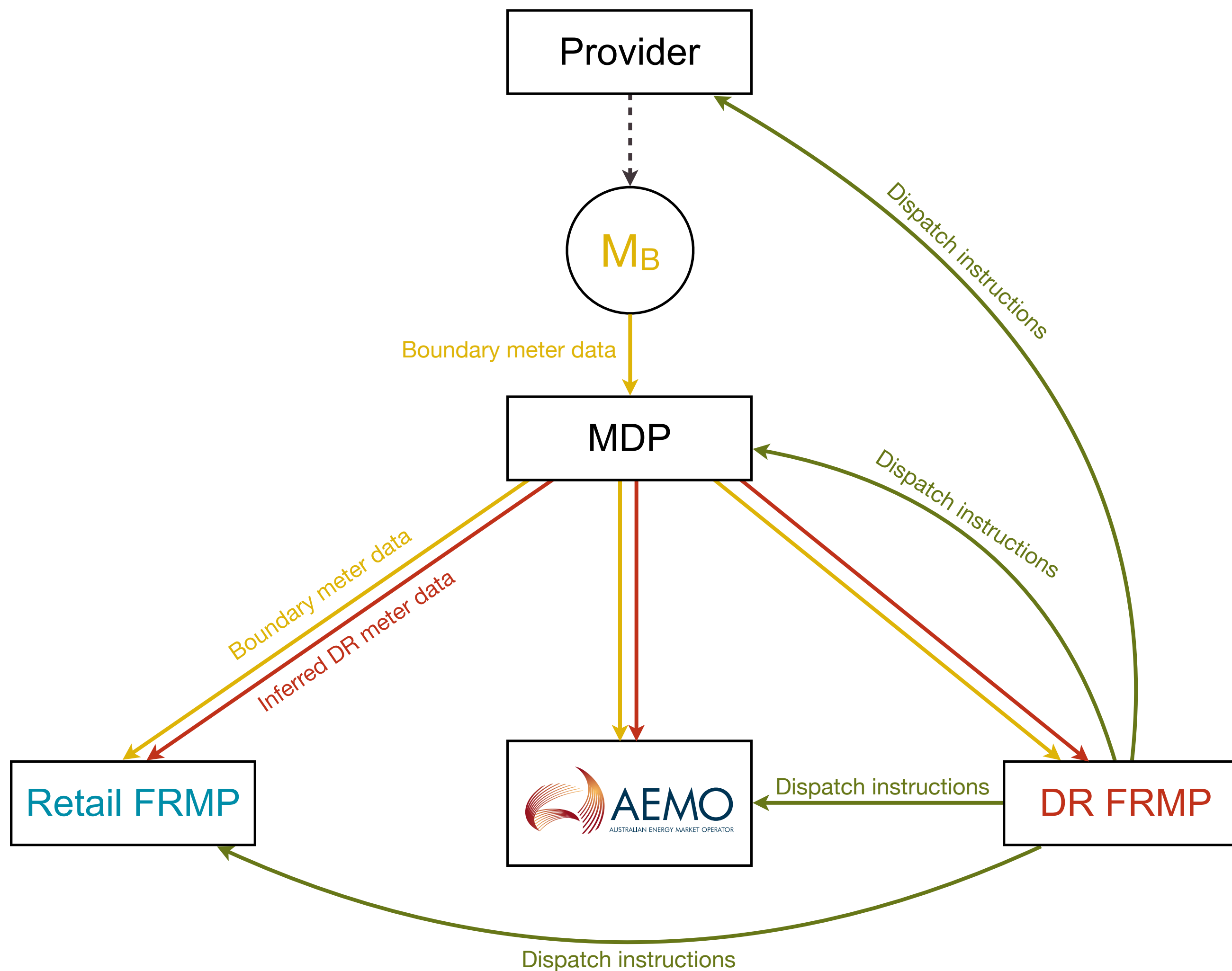


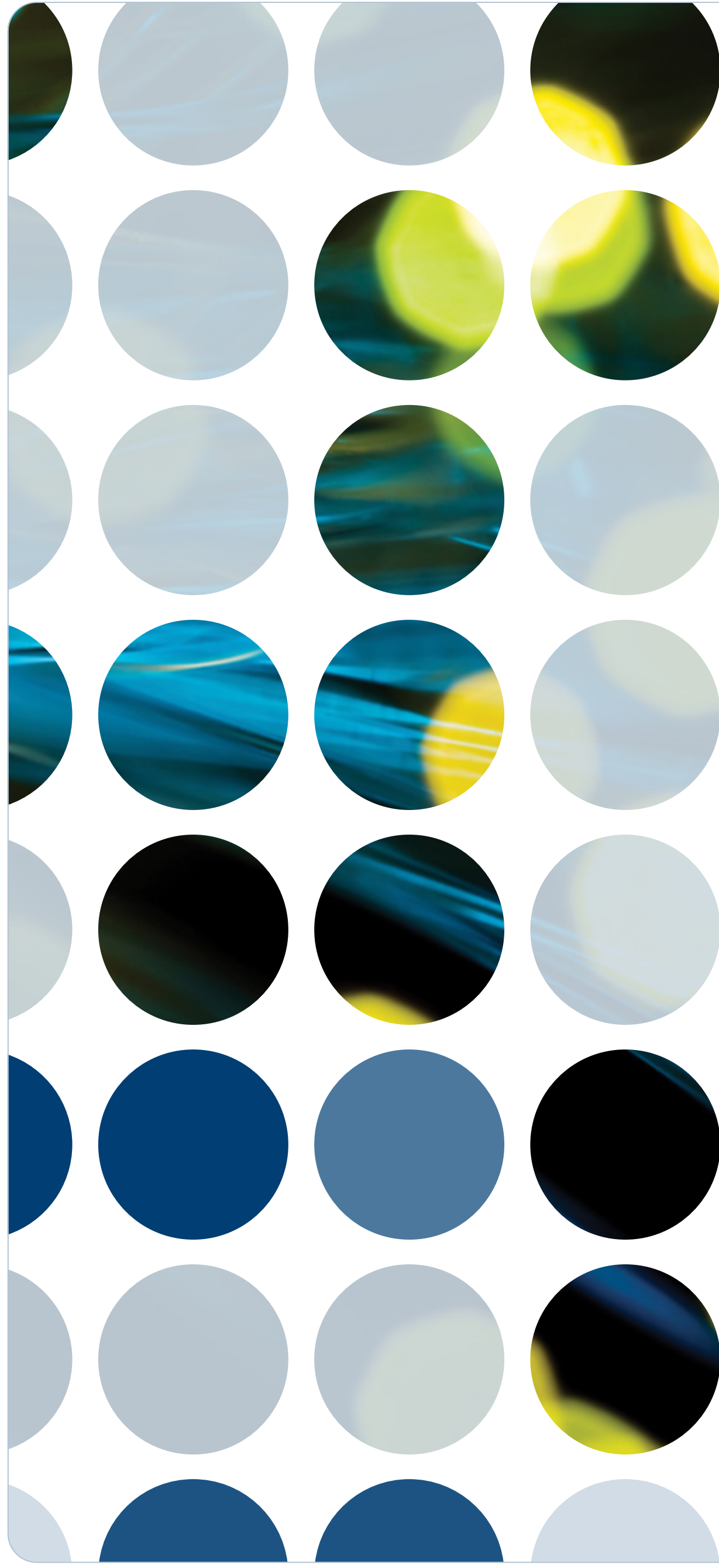
Demand Response FRMP

Straw man data flow, if scheduled



Straw man data flow, if unscheduled





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