Mr Kris Funston
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

19 May 2017

Lodged online

SACOSS
South Australian Council of Social Service

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Dear Mr Funston,

RE: Five Minute Settlement Direction Paper

SACOSS is the peak body for the non-government community services and health sectors in South Australia, with a long– standing interest in the efficient delivery of essential services. We thank the AEMC for their Directions Paper on the critical electricity market developments related to Five Minute Settlement.

SACOSS appreciates the need for appropriate NEM market design to provide the right price signals including for flexible generation. However, we are very concerned about the potential wider changes that a 5-5 might bring on, particularly with regards to system security.

We thank the Commission for their engagement with us on this issue. We note that we have met with the Commission twice to explore this issue in depth and we are grateful for the consultation efforts. We have attached below as part of our submission our recent presentation to the Commission, which highlights our concerns with this rule change proposal.

We thank you in advance for consideration of our comments. If you have any questions relating to this submission, please contact Jo De Silva on jo@sacoss.org.au or 08 8305 4211.

Yours sincerely,

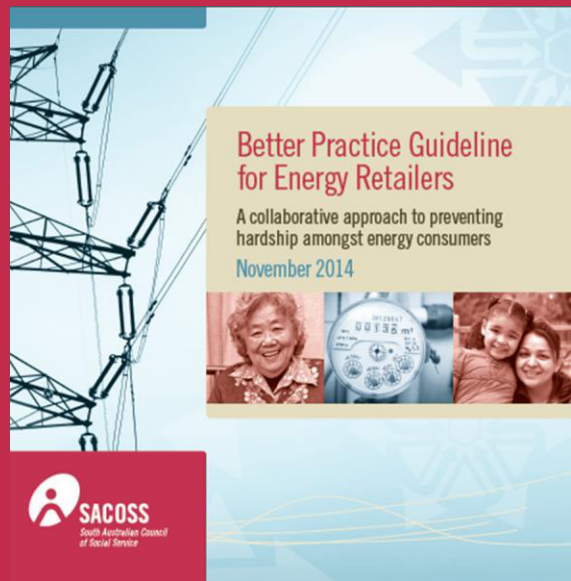
Ross Womersley
Chief Executive Officer

AEMC 5/30 Directions Paper
SACOSS Response to Consultation

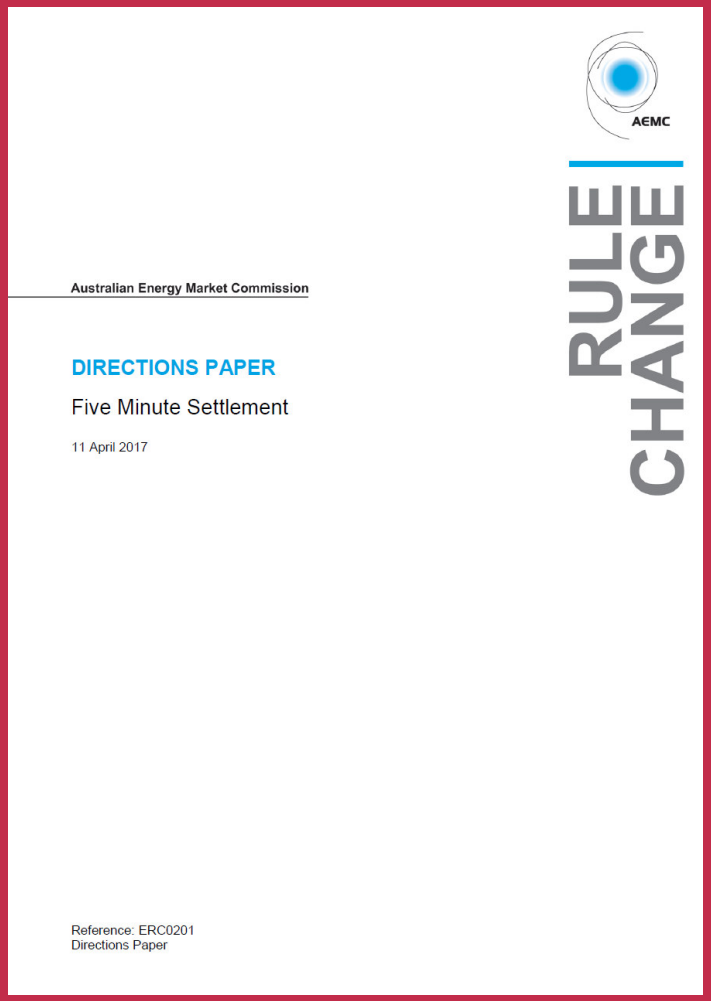
18 May 2018

SACOSS Background

- Protecting Consumer Interests
- Significant time/resources in the energy space
  - Traditionally centred in Retail and Distribution
  - Increasingly in Wholesale Markets (gas & elec)
- A consumer voice in areas such as …
  - AER TNSP regulatory reset hearing
  - AEMC Power System Security TWG
  - ESCOSA Technical Discussions



Directions Paper – Current SACOSS Position



- Historically, provided luke-warm support for 5 min Settlement
- Our current analysis
  - some concern around pricing outcomes over the long term
  - some concern on cost-benefit
- Publicly support batteries
- Seek further information from the AEMC

Presentation Overview

- 5/30 minute challenges
  - Acknowledge it will stop late Trading Interval (TI) rebidding, thereby dis-incentivising late TI rebidding (~$1-2/MWh decrease in annual benefit)
  - Assert it may create additional new behaviours that may be far more significant (~1-4/MWh increase in annual RRP's)
- AEMC Paper
  - Good discussion, but appeared to be lacking significant detail at the dispatch modelling and sub-dispatch timeframe (system security)
  - High-level economic discussion valuable
  - Some discussion on market behaviour challenges
- SACOSS Submission
  - Will cover some elements of AEMC Questions
  - Q4 (bidding behav) & Q9 (contract market)

CURRENT CONTEXT

From a non-participant point of view ..

- Argument put forward by ‘spot exposed’ entities – is this a financial management issue?
- Supported by battery proponents (who require volatility for business cases value streams)
  - Only two ways to reduce NEMDE price spikes!
    - more generation available or
    - less demand to be met!
  - Very little recognition of role of demand bidding to stop the escalation to high dispatch prices
  - Very little discussion on system security implications
- Political Pressure from the Senate
- Technologist Pressure from ‘New Energy’ Sector

Since the rule change was suggested …

- System Reliability
  - SA Blackout Reviews (x4)
  - Finkel Review
  - NSW Review (10-Feb-17)
- AEMO Future Power System Security Project
- ESCOSA/AEMO Inverter (Technical Standards) Review
- Good Faith Rebidding
- AEMC System Security Framework
  - PSS-TAG
  - Inertia/FFR Market
- Gas Market Intervention
- ASTAG and Regulation Market Issues
  - AEMO 35MW local requirement
  - System Oscillation

5 MIN DISPATCH … INTO THE WEEDS

Economic theory to actual dispatch conditions

Examples from the Paper

- Table 3.1: 30 min Settlement

Period	Price ($/MWh)	Gen 1 MW - Battery	Gen 2 - OCGT
DI1	600	100	0
DI2	600	100	0
DI3	300	0	100
DI4	300	0	100
DI5	300	0	100
DI6	300	0	100
TI Avg	$400/MWh	33.33	66.67
	Gross Rev	$6,667	$13,333

- 5 min Settlement (with additions)

Period	Price ($/MWh)	Gen 1 MWh - Battery	Gen 1 - Spot Rev	Gen 2 MWh - OCGT	Gen 2 - Spot Rev	Gen 2 - Gas Use
DI1	600	50	2500	0	0	0.0
DI2	600	100	5000	0	0	0.0
DI3	300	0	0	50	1250	45.8
DI4	300	0	0	100	2500	91.7
DI5	300	0	0	100	2500	91.7
DI6	300	0	0	100	2500	91.7
	$400/MWh	Gross Rev	$7,500		$8,750	$3,208

Details around the Stylised Example

From the example (and general theme of the paper)

- Appears fairer?
- Appears to address an inequality?
- Sends clearer dispatch signal?

In reality ..

- Economic Impacts → Market changes → Physical Changes
- Markets change the Physical (and vice versa)
- Decisions being made at dispatch affect the next dispatch interval

Changes in Participant Behaviour

- Scenario 1: OCGT unlikely to sell cap contracts
  - Unlikely to be able to 'protect' against spikes
    - Increase in premiums – Table 2 (Energy Edge)
    - Reduce Volumes – Section 4.6 (Energy Edge)
  - If less contracted, incentive to turn on becomes pure spot revenue assessment
    - The accuracy of 5min Predispatch will be paramount
    - Assuming actual (in previous example) was showing predispatch, OCGT would likely bid unavailable at DI2. Why?
  - Commitment cost = SRMC plus start costs, ~ $8,700
    - 100MW at 11GJ/MW Heat Rate, 370GJ gas for 30min @ $10/GJ = ~$3700/TI
    - Conservative Start Costs: Annual Fixed Costs (ACIL) / Annual Starts ($400k/80) = ~$5000/start (very conservative → up to $14k)
    - No cap contract premium (100MW x $5/MW) = ~$500

Scenario 1: In Practise

- It will cost OCGT ~$9k to start for a half hour … it will avoid that cost until there is more certainty. Therefore, more likely outcome at 30 min is ..

Period	Price ($/MWh)	Gen 1 MW - Battery	Gen 2 - OCGT	Comments
DI1	600	50	0	
DI2	600	100	0	Bids Unavailable
DI3	600	100	0	
DI4	600	100	0	
DI5	600	100	0	
DI6	600	100	0	
TI Avg	$600/MWh	91.67	0.00	
	Gross Rev	$27,500	$0	

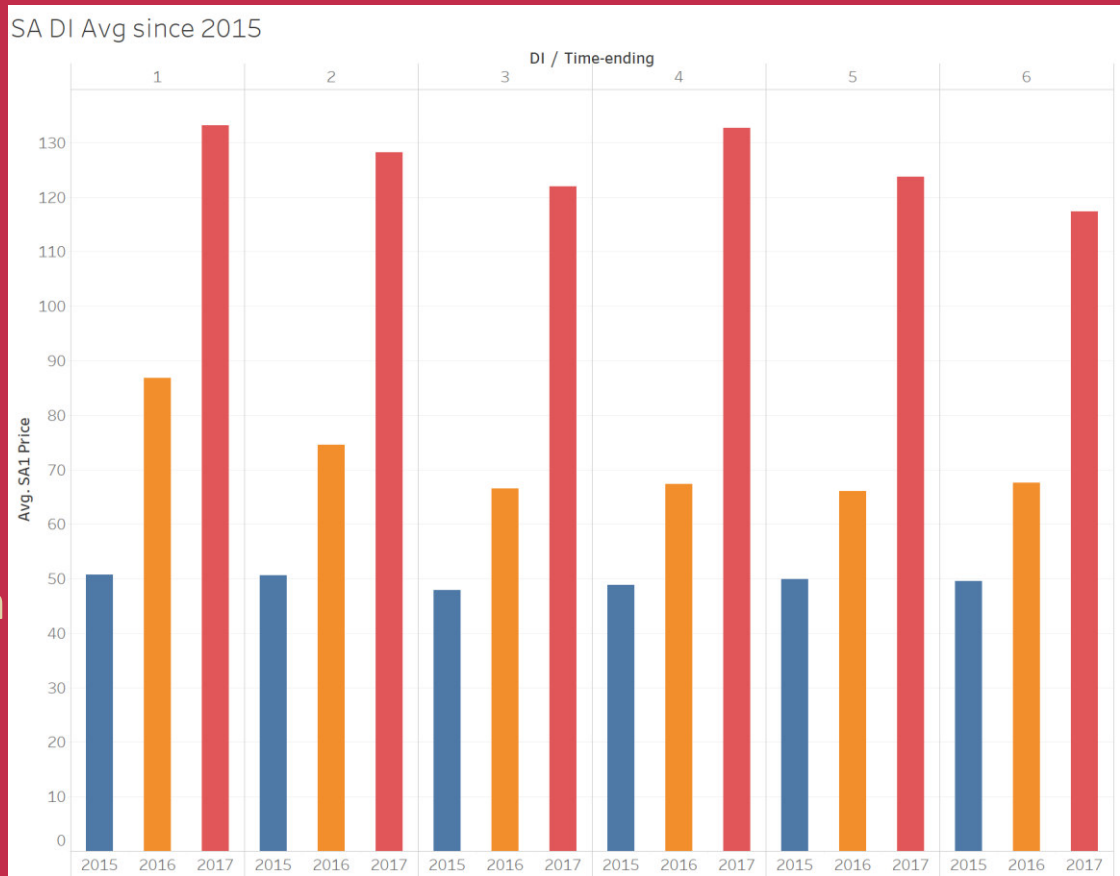
- And at 5 min … Average RRP higher as battery continues to set price, OCGT doesn't commit to generate

Period	Price ($/MWh)	Gen 1 MW - Battery	Gen 1 MW - Spot Rev	Gen 2 MW - OCGT	Gen 2 MW - Spot Rev
DI1	600	50	2500	0	0
DI2	600	100	5000	0	0
DI3	600	100	5000	0	0
DI4	600	100	5000	0	0
DI5	600	100	5000	0	0
DI6	600	100	5000	0	0
	$600/MWh	Gross Rev	$27,500		$0

Changes in Participant Behaviour (cont)

- Scenario 2: Post-price jump decreases wont occur!
  - SA Dispatch Prices since 2015 by DI
  - Clear decreasing trend post DI1
  - Increases in local generation after spike as half hour continues (rebids lower RRP)

- The behaviour driving this changes the outcome ..
- Initial estimates .. $1-$4/MWh



Other observations in SA ..

			DI 1	2	3	4	5	6
Some Generation Response	2015	Avg. SA1 Price	9,137	8,914	8,010	5,788	5,241	3,671
		Avg. SA1 Generation	1,618	1,408	1,527	1,635	1,392	1,559
		Count	10	12	7	10	4	9
	2016	Avg. SA1 Price	7,714	7,746	5,338	7,136	5,352	5,571
		Avg. SA1 Generation	1,358	1,310	1,343	1,339	1,355	1,235
		Count	48	30	42	30	35	25
	2017	Avg. SA1 Price	10,549	7,348	6,996	9,300	5,552	4,950
		Avg. SA1 Generation	1,881	1,981	2,025	1,888	1,882	1,888
		Count	11	11	9	7	8	9
No Generation Response	2015	Avg. SA1 Price	4,899	4,578	5,671	7,671	6,164	6,496
		Avg. SA1 Generation	1,728	1,537	1,406	1,287	1,521	1,721
		Count	10	7	8	8	20	16
	2016	Avg. SA1 Price	6,012	4,694	2,482	3,104	5,674	7,181
		Avg. SA1 Generation	1,506	1,372	1,609	1,484	1,392	1,371
		Count	42	36	22	32	23	28
	2017	Avg. SA1 Price	5,551	8,941	6,146	9,026	7,580	8,104
		Avg. SA1 Generation	1,994	2,244	1,899	2,062	1,980	2,158
		Count	11	7	7	13	11	5

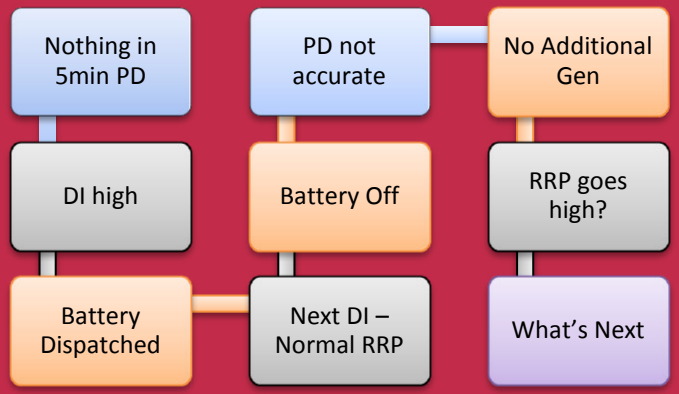
← When generation increased in the subsequent interval, DI prices were lower by DI6 compared to when a response had not occurred

→ When the RRP stayed above $500 for more than 1 DI, significantly more generation by DI6 (“the response”).

			DI 1	2	3	4	5	6
Generation Response When RRP above $500 For 2+ DI’s	2015	Avg. SA1 Generation	1,813	1,779	1,715	1,606	1,292	1,616
		Avg. SA1 Price	3,301	545	7,045	6,359	589	7,013
		Count	5	2	2	4	1	8
	2016	Avg. SA1 Generation	1,152	1,412	1,346	1,437	1,382	1,304
		Avg. SA1 Price	8,024	5,930	4,525	4,341	4,976	5,774
		Count	23	38	33	35	32	36
	2017	Avg. SA1 Generation	2,159	2,085	2,164	2,117	2,024	2,047
		Avg. SA1 Price	9,863	8,497	8,611	11,755	13,374	5,682
		Count	7	11	10	12	7	10

Changes in Participant Behaviour (cont)

- Scenario 3: Batteries will be ‘played’ due to short duration energy limits
  - It is claimed that this will enable batteries to compete: would contend they already can!
  - More likely to create greater uncertainty (which in turn generally adds to prices!)



Our Issue with all this …

- And what we are seeking further information from the AEMC on (Section 4.4.3):
  - Appears more than just ‘transitional’ issues?
  - Higher spot market outcomes result in higher underlying contract prices PLUS
  - Already have liquidity issues in SA across all product types; would the contract market evaporate completely?
  - Battery providers unlikely to supply caps?
  - As noted by the AEMC: Uncertain impact!
  - How will this be better for SA consumers?

Futures Market - Caps: Already Scant

What are the implications?

- Under both 5/30 min, battery can compete with lower SRMC and start costs, however ..
- Under 5 minute settlement, system security implications are completely different
  - Gas fired generators will not commit therefore:
    - Inertia of the system will be completely different
    - Voltage response will be different
    - Ramping potential will be different
  - SA becomes SUPER reliant on AEMO 5min pre-dispatch producing very accurate results but …
  - As volatility increases, DR becomes more difficult to forecast

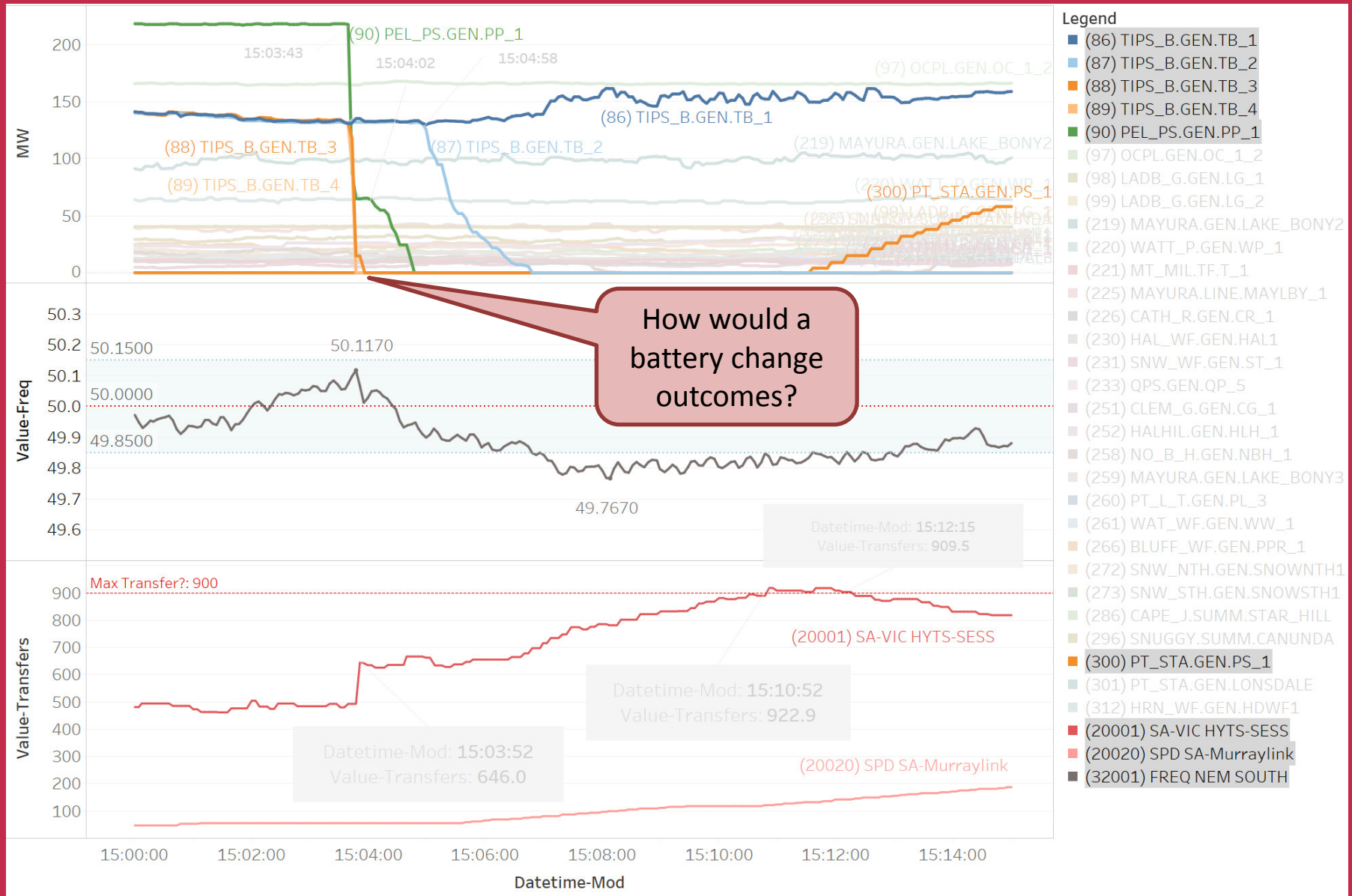
Working with Batteries

- SACOSS on the public record supporting introduction of batteries … nothing against the technology!
  - Quick installation time
  - Can be integrated into existing frameworks (even without 5 min settlement rule change)
- Battery will drop MW capacity as it discharges
  - State of Charge becomes an important variable in dispatch
  - Energy AND Capacity are equally important
- Most vendors have very little understanding of dispatch and dispatch security
  - Operating in US markets in big systems different to energy-only, FCAS optimised small systems
  - Little understanding of FSIP and FCAS

Working with Batteries (cont)

- Battery ramp rate profiles likely to be high EVEN IF they can't get full output in 100ms
- NEMDE will include them in the next DI … resulting in less 'random' spikes due ramp rates and constraint binding → this will result in lower average RRP's!
- Fast Start Inflexibility Profiles (FSIP's) include
  - Minimum load (0MW for battery vs GT)
  - time to synchronise (T1) – <1 min
  - time to ramp to minimum load (T2) – 1 min
  - minimum time above minimum load (T3) – ? min
  - time to ramp down (T4) – 0 min

System Security: 3-Mar-17 at 4 sec



SACOSS POSITION

At present, SACOSS view is..

- Haven't seen the clear case presented
  - Technology will be installed irrespective of 5/30
  - Unclear whether change in best interests of SA consumers; certainly not if RRP increased and reduced potential for contracting
- Would like to see further discussion on:
  - System security implications in finer details
  - Clearer cost-benefit analysis
  - See all the current market and technical reviews 'settle' before making a such a significant change
- Focussed on SA here, but all regions affected … national implications
- Suggest continuing discussion, but doesn't appear as clear-cut as perceived

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