



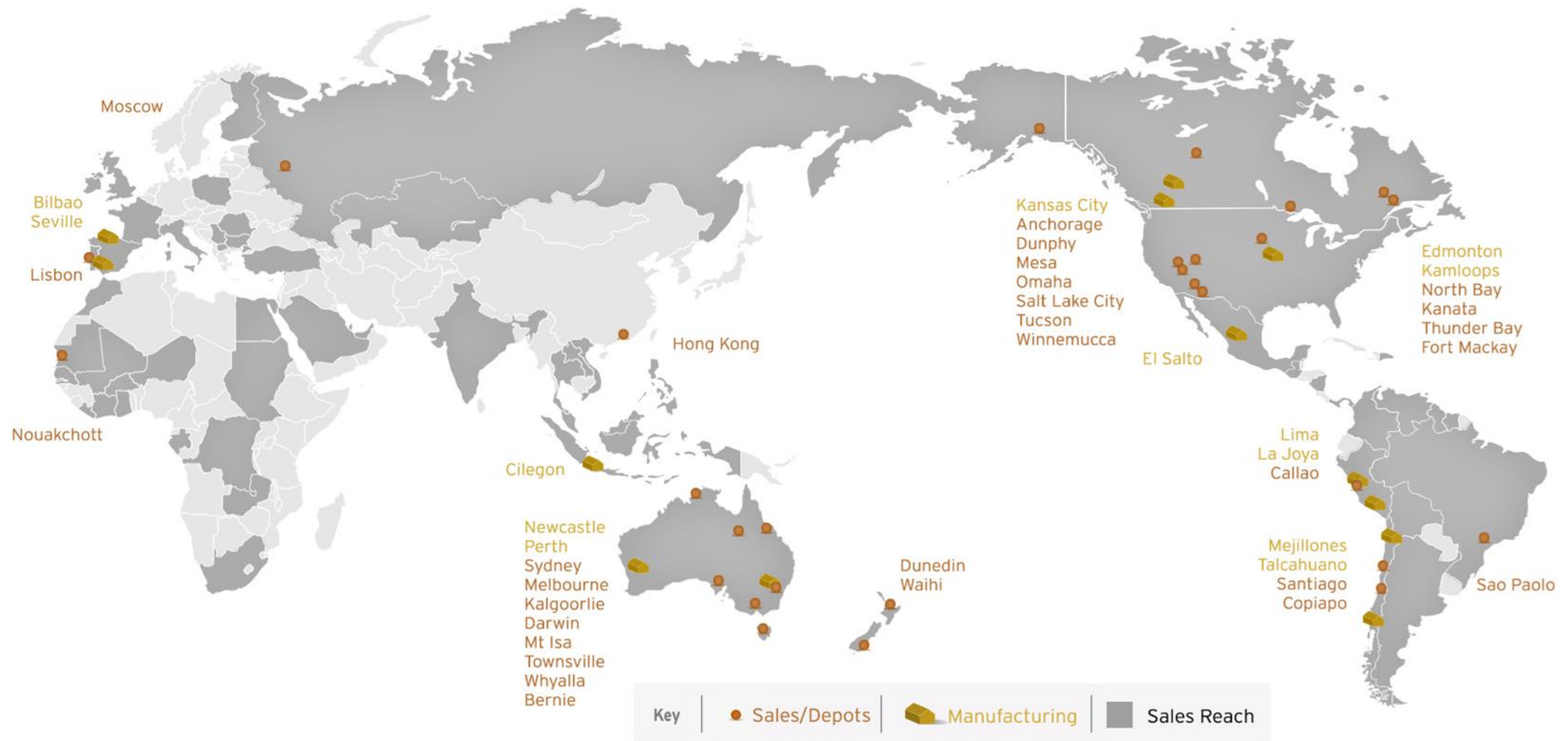
November, 2019

# DEMAND RESPONSE

PRESENTER: Jeffrey Neave, Environment Manager



# GLOBAL FOOTPRINT





## KEY GLOBAL PRODUCTS



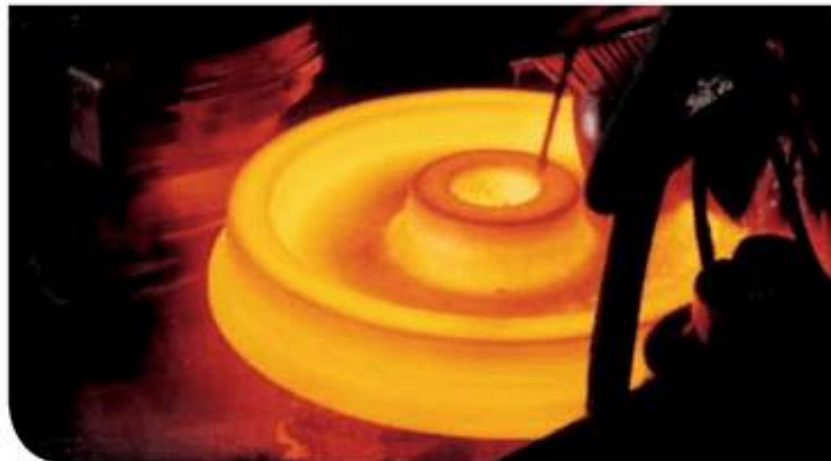
**Grinding media** for the mining industry  
Capacity 1.8 Million Tonne per annum globally  
Capacity 0.3 Million Tonne per annum in Australia.

(Ball Mills consume 4% of the worlds electricity).

## MOLYCOP NEWCASTLE (in addition to Grinding Media)



- **Rail Wheels** for Australian and NZ
- Current production level of **44,000** wheels per year.
- Approx **75%** of the rail wheels in Australia today have been made at the Newcastle site.
- Market leader in heavy haul technology

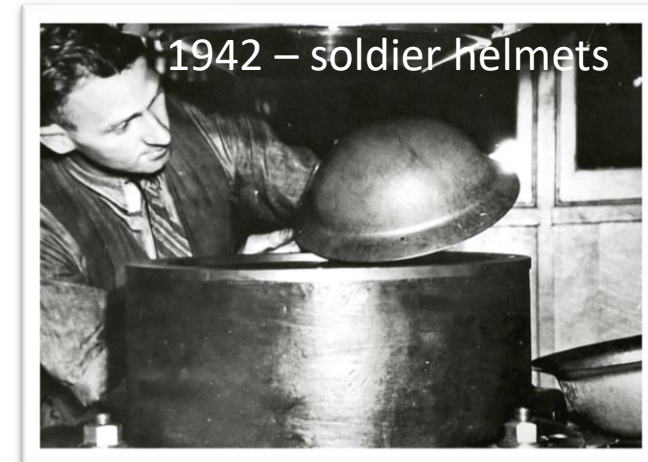




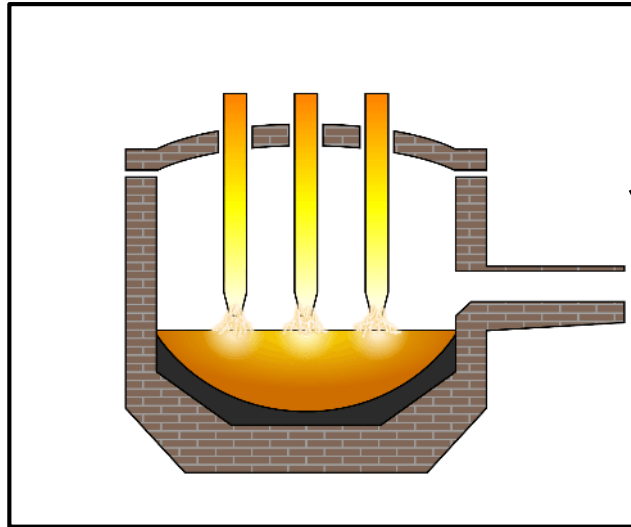
# ABOUT US – MOLYCOP NEWCASTLE



- Born from adversity
  - Comsteel was established in Newcastle (1918) to secure local supply of railway products during WW1
  - In lead up to WW2 developed capability to manufacture ordnance steel and armour plating
  - During WW2 manufactured and supplied munitions, armour plating, helmets, forgings and ship castings
- Cornerstone of innovation
  - Pioneered electric arc steelmaking in Australia with the installation of the first EAF in the southern hemisphere in 1919
  - Commenced production of grinding media in 1930 to support Australia's burgeoning hard rock mining industry
  - Developed 40+ tonne axle load rail wheels that supported the introduction of the world's longest and heaviest trains on the Pilbara railways
  - Developing carbon/coke replacements using waste materials as steelmaking additions under EPA approved trials.



# MOLYCOP NEWCASTLE – Departmental Process flow



## Electric Arc Furnace (36MW)

Scrap steel melted in 60T  
batch each hour.

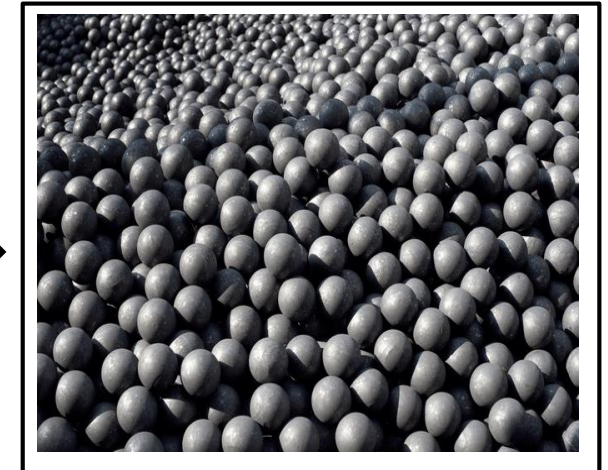
Capacity 250,000 tpa



**Rail Products** converts steel to  
Rail Wheels



**Bar Mill** converts steel to  
round bar.



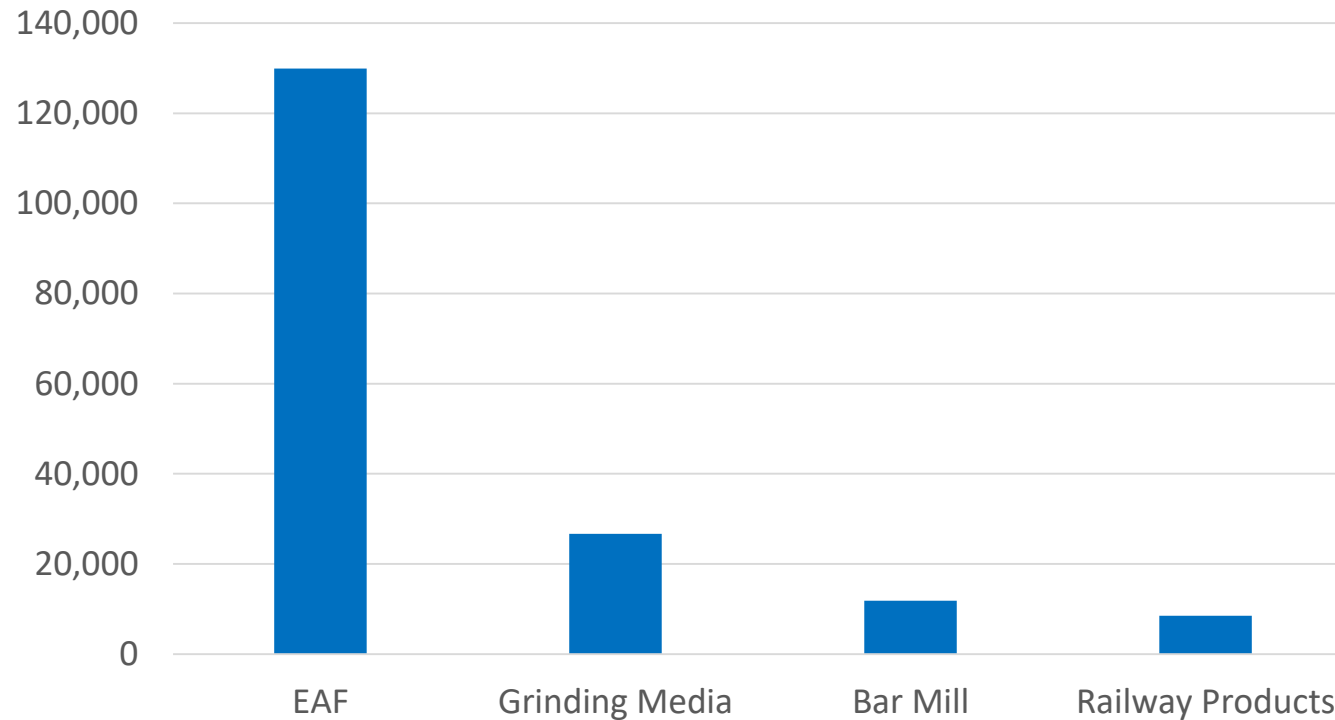
**Grinding Media** converts round  
bar to grinding balls



# MOLYCOP NEWCASTLE



Relative Electricity Consumption (Annual MWh)

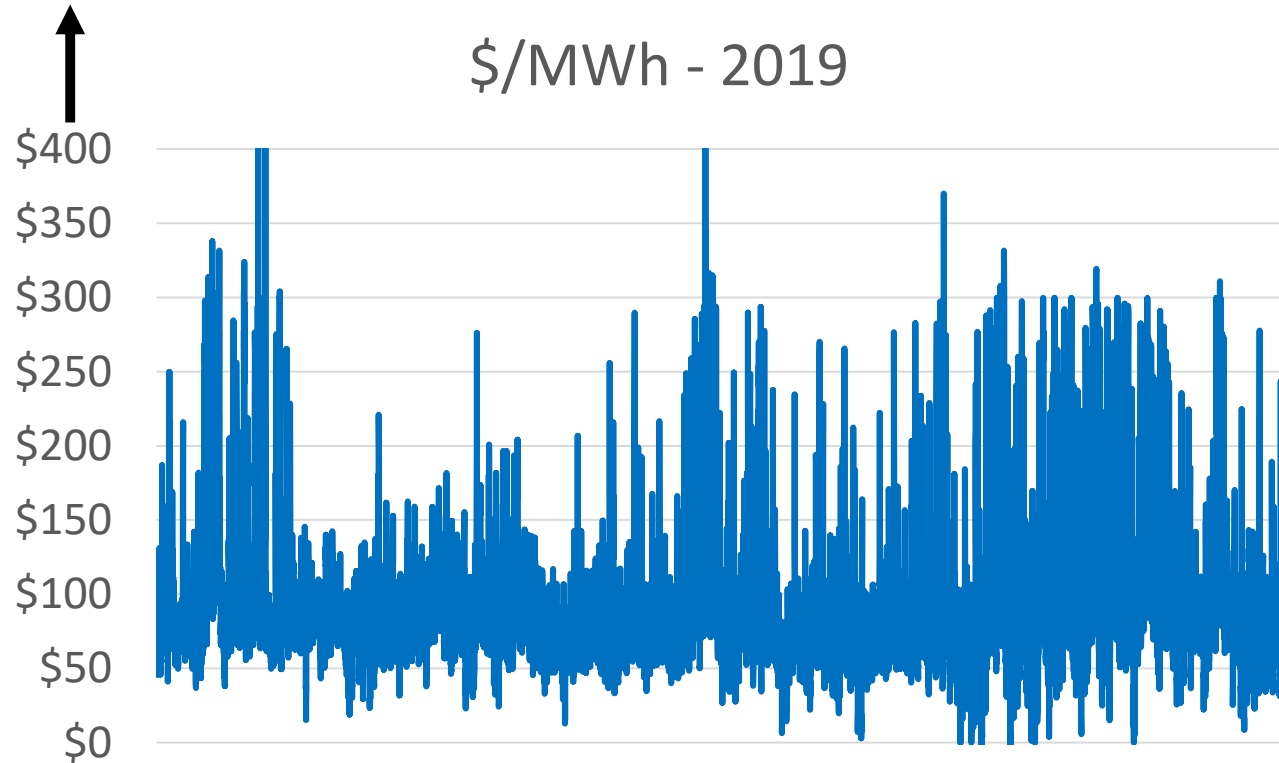


- Electricity costs Molycop Newcastle approximately \$2,000,000 per month
- Total electricity use is equivalent to about 12,000 households
- Electricity historically purchased on the spot market (price changes each 30minutes)



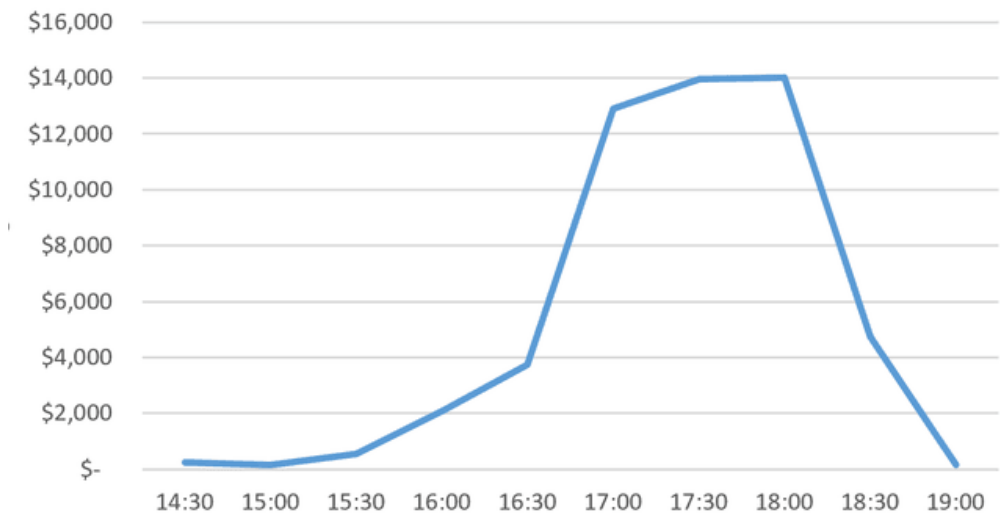
# NSW SPOT PRICE VOLATILITY

\$/MWh - 2019



Spot price varies up to \$14,000/MWh changing each 30minutes

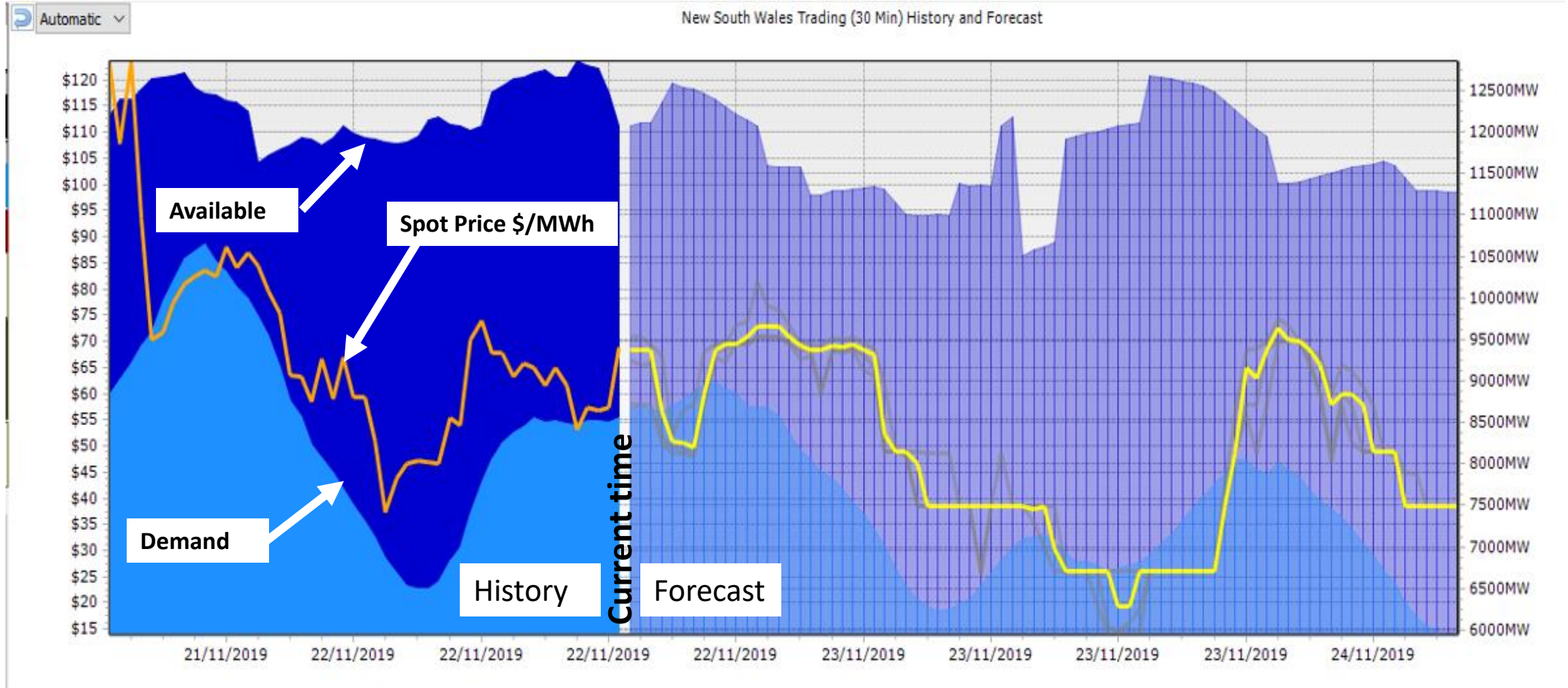
Spot market price in NSW on 10 February 2017



Actual event. Spot price goes from \$100 to \$14,000 in 3 hours

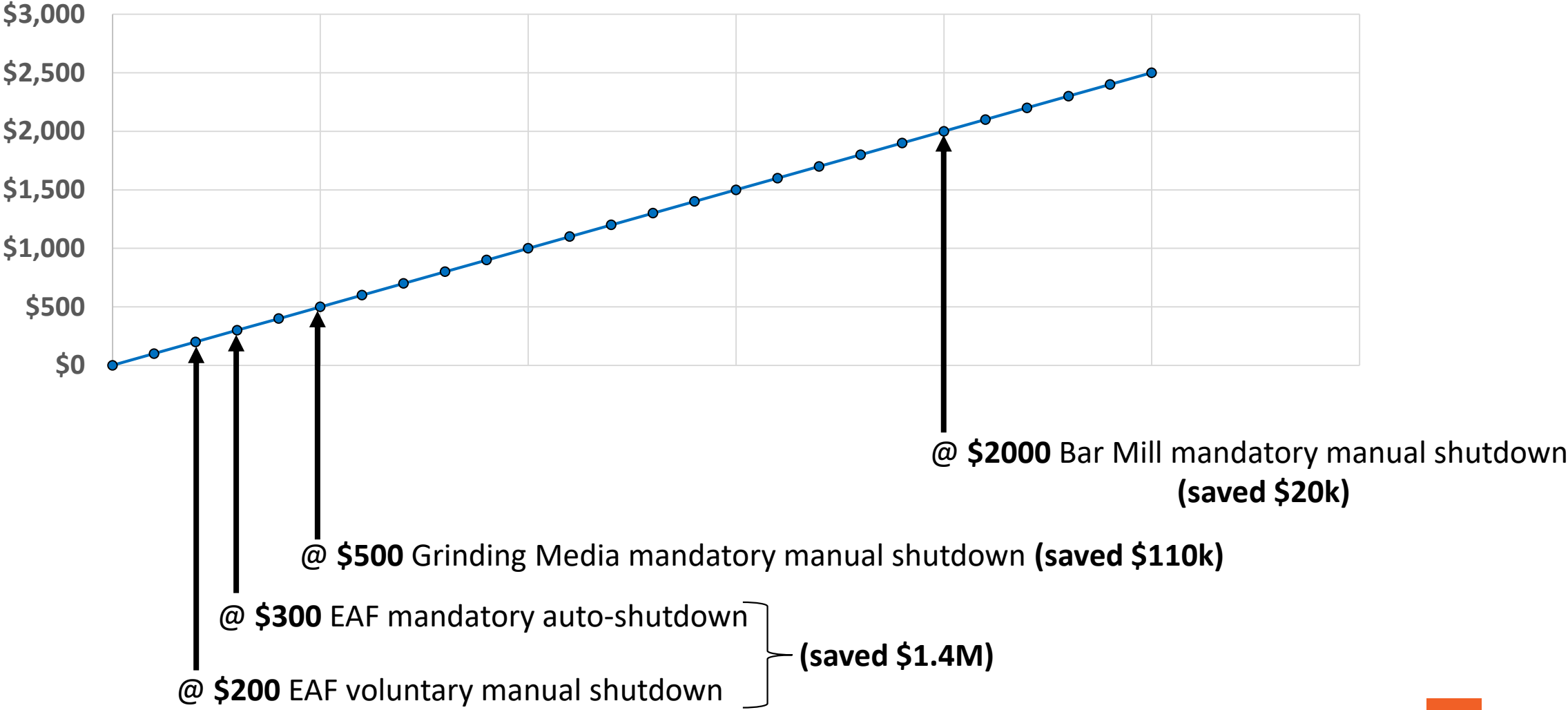


# SPOT PRICE FORECASTING



# MOLYCOP LOAD SHEDDING

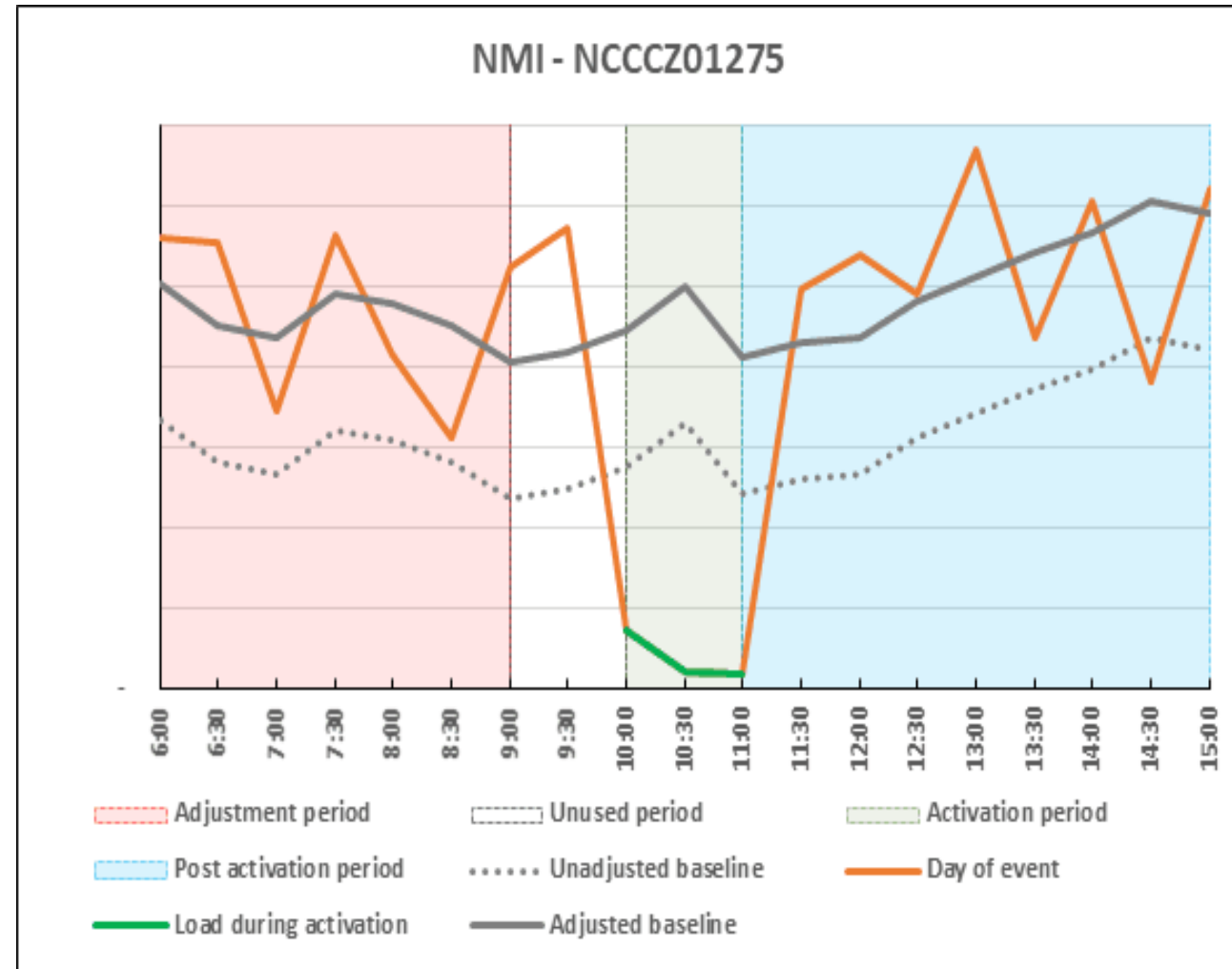
Molycop Load Shedding in 2019 per Spot Price \$/MWh



# MOLYCOP - ARENA DEMAND RESPONSE PROGRAM



- ARENA program rewards participants to reduce load in peak demand times to improve grid reliability.
- Molycop engaged by FlowPower to take part in the program.
- Demand response ability verified by 6-monthly trials.
- Shutdown response coordinated by a combination of FlowPower provided hardware and SMS notifications.



Recent ARENA DR trial. Molycop shed 80% of its load for 1-hour





## DEMAND RESPONSE LEARNINGS

- Flexibility of load is key to survival in a volatile electricity market if buying on the spot market.
- Demand response should be automated wherever possible
- Need to understand cost drivers
- Education of workforce
- Price volatility for Molycop now partly controlled by recent renewables electricity PPA with FlowPower. (55% of Molycop's electricity now sourced from renewables).





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