



Melbourne
Energy
Institute

MEInetwork23 Seminar #3: Energy commodity trading

Speaker: **Mr Keith Handbury**
Energy Trader at Shell

Moderator: **Dr Adrian Panow**
*Director of Major Projects,
Melbourne Energy Institute*

6 July 2023

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MEInetwork23 Seminar Series

Seminar topic	Month
Crude oil and product supply chains - Nicholas James, VIVA Energy	<i>Recording available online</i>
Uranium mining and refining	<i>Recording available online</i>
Energy commodity trading	6 July
New energy commodities and critical minerals	10 August
Fiscal policy to support future energy commodity exports	7 September

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Energy Commodity Trading

The key role that trading plays in energy supply

Keith Handbury
Energy Trader, Shell Energy Australia



About Shell Trading and Shell Energy Australia

Shell Trading

- The Shell group of companies has large businesses in oil products, gas and power, and chemicals, both in **production & sales/marketing**
- To support these businesses, Shell trades in many products:
 - Natural gas, electrical power, crude oil, refined products, biofuels, chemical feedstocks, environmental products and freight



Shell Energy

- Providing **more and cleaner energy** for our customers through the energy transition
 - Expansion of electricity and renewables businesses
- Shell Energy Australia established in 2017
 - 2019: acquired ERM (business retailer)
 - 2020: sanction of Gangarri solar farm
 - 2022: acquired Powershop (mass market retailer)
 - 2023: sanction of Rangebank battery (200 MW, 2 hours)

Why are energy products traded?

- Trading— simple definition— ‘*action or activity of buying goods and services*’
- More complex answer.....trading is driven by requirements for **risk management**
 - *Trading encourages investment by giving firms the ability to manage energy price risk*

Energy Producers

- Large investments require some certainty in sales pricing
- Example: LNG Project
 - \$10+ billion investment
 - Typically backed by long term sales contracts
 - Rely on spot markets for balancing



Energy Users

- Also large investments, where energy prices can determine profitability
- In some cases energy can be 30+% of input costs
 - Aluminium Smelter
 - Ammonia plant

Who is participating in traded energy markets

Examples from different markets

Participant	Electricity Market	LNG	Environmental Products
Producers	<ul style="list-style-type: none"> Solar or Wind Farm Gas fired power plant 	<ul style="list-style-type: none"> Integrated LNG Project 	<ul style="list-style-type: none"> Carbon offset developer Rooftop solar installer
Consumers	<ul style="list-style-type: none"> Aluminium Smelter Data Centre 	<ul style="list-style-type: none"> Import terminal 	<ul style="list-style-type: none"> Consumers with regulatory liability
Developers	<ul style="list-style-type: none"> Battery developer 	<ul style="list-style-type: none"> LNG Plant Proponent 	<ul style="list-style-type: none"> Solar or wind farm developer
Retailers	<ul style="list-style-type: none"> Mass market or C&I/ SME 	<ul style="list-style-type: none"> Gas retailer 	<ul style="list-style-type: none"> Energy Retailers
Transporters	<ul style="list-style-type: none"> Transmission operator 	<ul style="list-style-type: none"> LNG ship owner 	N/ A
Intermediaries	<ul style="list-style-type: none"> Banks Hedge Funds 	<ul style="list-style-type: none"> International trading houses 	<ul style="list-style-type: none"> Banks Hedge Funds

What types of products are traded?

Different Commodities

- Oil & Oil Products
- Coal
- Gas
- Electricity
- LNG
- Transportation
 - Freight
 - Pipeline Credits
- Environmental Products
 - Renewable Energy Certificates
 - Carbon Credits

Different Products

- Direct purchase of commodity
 - Options
 - Time spreads
 - Location spreads
 - Commodity swaps
- and many many more....

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Financial vs Physical

Participant	Physical Contract	Financial Contract
Principle	<ul style="list-style-type: none"> • Buyer pays seller a fixed price • Seller delivers commodity <i>(for agreed time, delivery location and specification)</i> 	<ul style="list-style-type: none"> • Buyer pays seller a fixed price • Seller pays buyer the commodity spot price, <i>(for agreed time, delivery location and specification)</i>
Barriers to Entry	<ul style="list-style-type: none"> • Must be able to deliver or take delivery 	<ul style="list-style-type: none"> • Increased regulatory requirements
Cost to buyer of commodity	Buyer pays: Volume x Fixed Price <i>under future</i> Total cost is Volume x Fixed Price	Buyer pays: Volume x (Fixed Price – Spot Price) <i>under swap</i> Volume x Spot Price <i>for spot physical</i> Total cost is Volume x Fixed Price

Total cost to buyer is the same whether hedged using physical or financial contracts

How is trading facilitated?

Exchange Trading

- Transactions '*sleeved*' through clearing counterparty
- Pricing more transparent – all transactions, bids and offers visible to all parties
- Typically more stringent regulations
- Typically higher credit requirements (but lower counterparty risk)

Over-the-Counter (OTC) Trading

- Transact directly with counterparty often under master agreement
- Prices negotiated directly or through brokers, less transparency
- Master agreement defines boilerplate terms
- Negotiate credit directly with counterparty (often more flexible)



Key risks in trading

Market Risk

- What if market prices move against you

Credit Risk

- What if your counterparty does not fulfil their obligations

Liquidity Risk

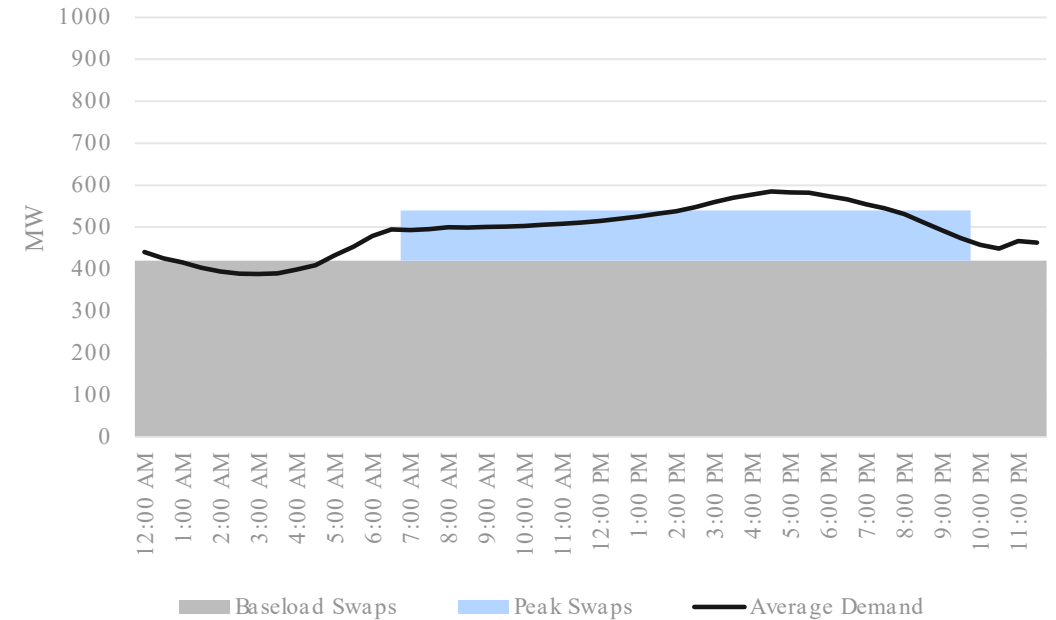
- What if the product you want isn't available to buy?
- What if you run out of cash?

Operational Risk

- What if your internal processes fail?

Case Study – Power Market

- AEMO Spot Market
 - All physical sales go through here
 - Different price every 5 minutes
- Forward Market is 100% financial
 - Helps to promote liquidity
- **Futures/Swaps** most common product
 - Buyer pays fixed price for fixed volume (MW/ MWh)
 - Seller pays spot price for same volume

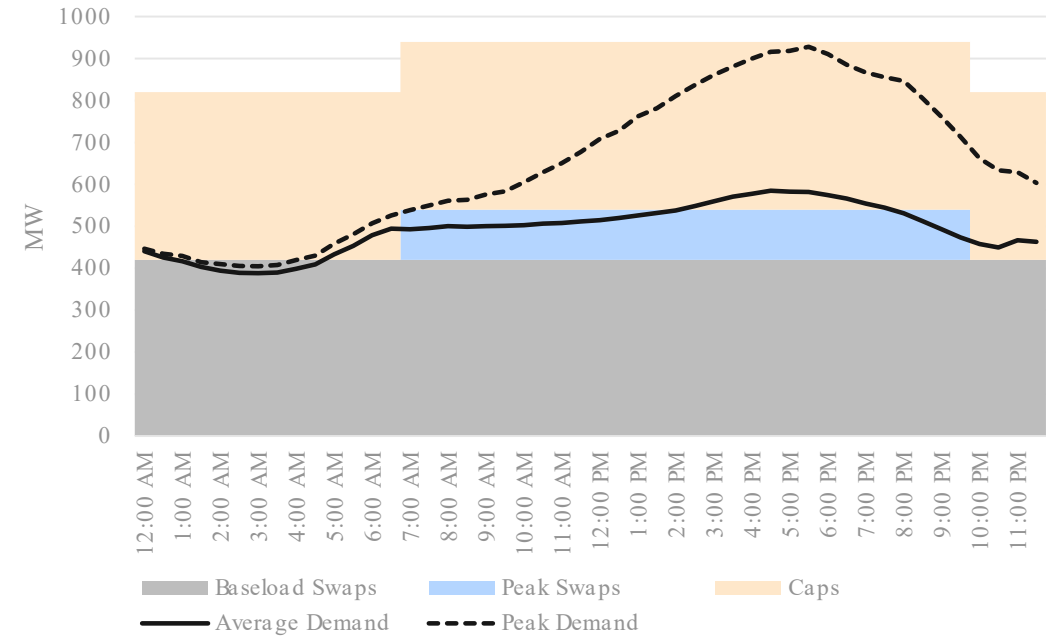


- Different ‘Shapes’
 - Baseload: 24 hours x 7 days
 - Peak: 7am-10pm x 5 days

Case Study – Power Market

Options are common – required for electricity users to manage variable demand/ supply:

- **Cap Product**
 - Seller pays every time the 5 minute spot price goes over \$300/ MWh
- **Average Rate Options**
 - Seller pays if average price across a quarter is above or below a ‘Strike Price’

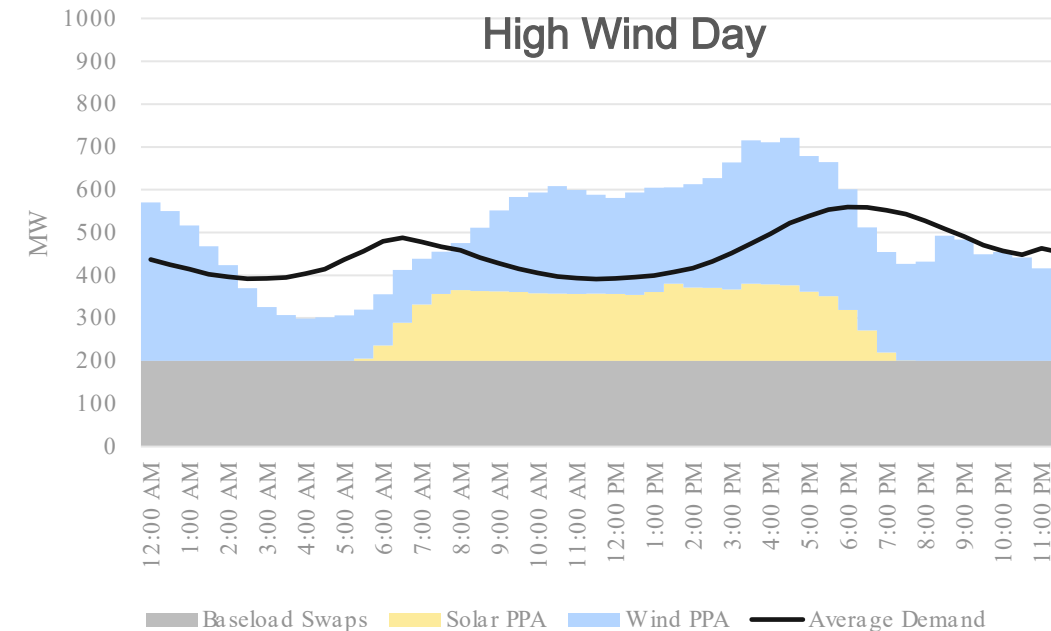
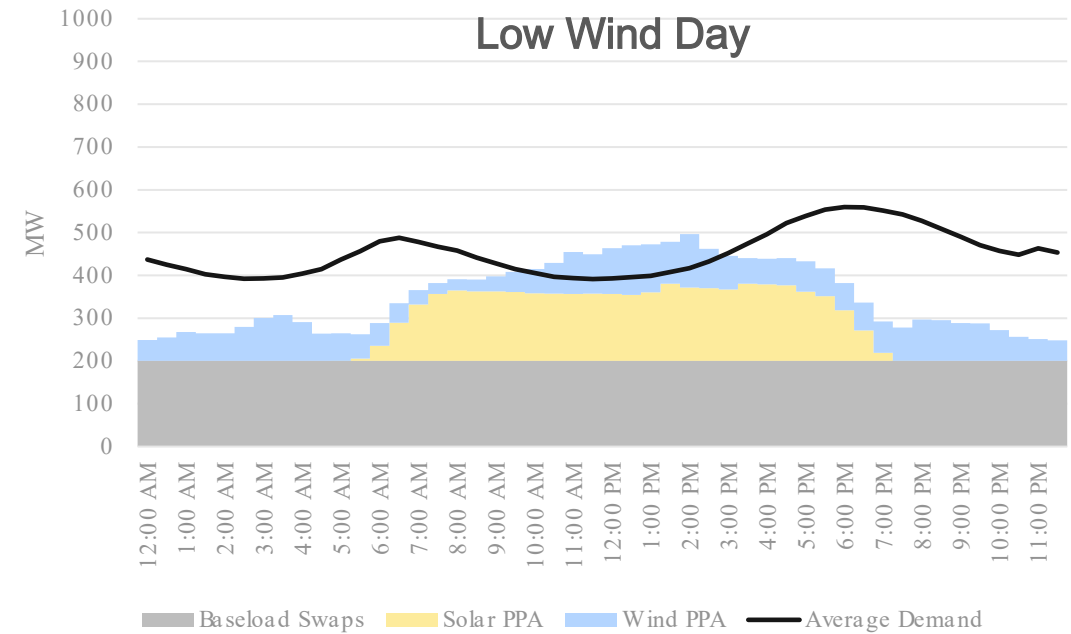


- **Swaptions**
 - Buyer has right to buy or sell forward swap at pre-agreed ‘Strike Price’

Case Study – Power Market

New types of products being developed to manage modern profiles with higher intermittency:

- Fixed Daily Profiles: e.g. Solar, Overnight, Super Peak
- Virtual storage products:
 - Sold by hydro or batteries
- Weather Linked Products
 - Linked to temperature or wind speed






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