



IMARC

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See www.2xEP.org.au and my *Linkedin page*

Background: A2SE and 2xEP

- A2SE not-for-profit company established 2009 for a more energy efficient and productive Australia. Board of senior energy management experts.
- Recognised need for improving national productivity, competitiveness and jobs. Launched 2xEP in January 2014
 - **2xEP= Double energy productivity by 2030 (2010 base)**
- Steering Committee directs 2xEP, which includes Sid Marris form MCA
- 10 working groups



PRESIDENT OBAMA

I'm issuing a new goal for America: let's cut in half the energy wasted by our homes and businesses over the next twenty years. –
State of the Union, February 2013

What is energy productivity (EP)?

Value created by using each unit of energy

... looking at energy use as a driver of total mining productivity



DOUBLING AUSTRALIA'S
ENERGY PRODUCTIVITY

Why is EP important to the mining industry?

- Competitiveness / Bottom line benefit
- Climate change / License to operate
- Fuel security

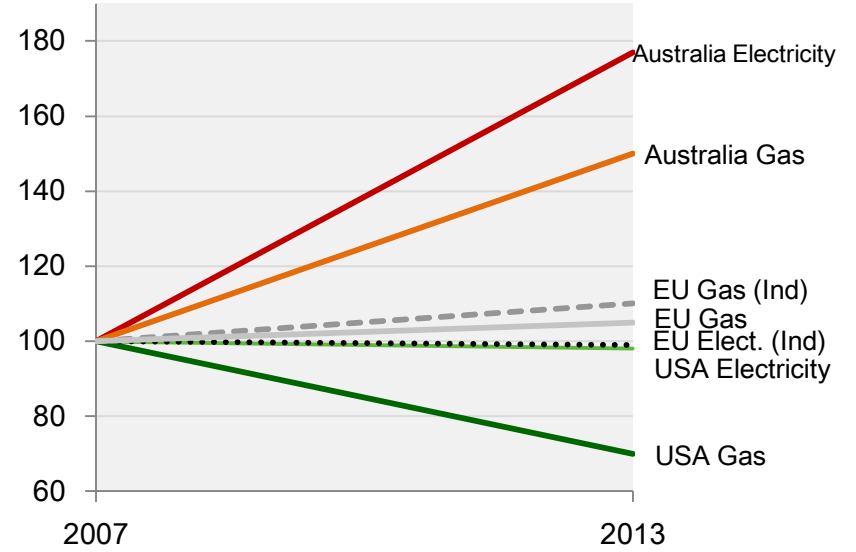
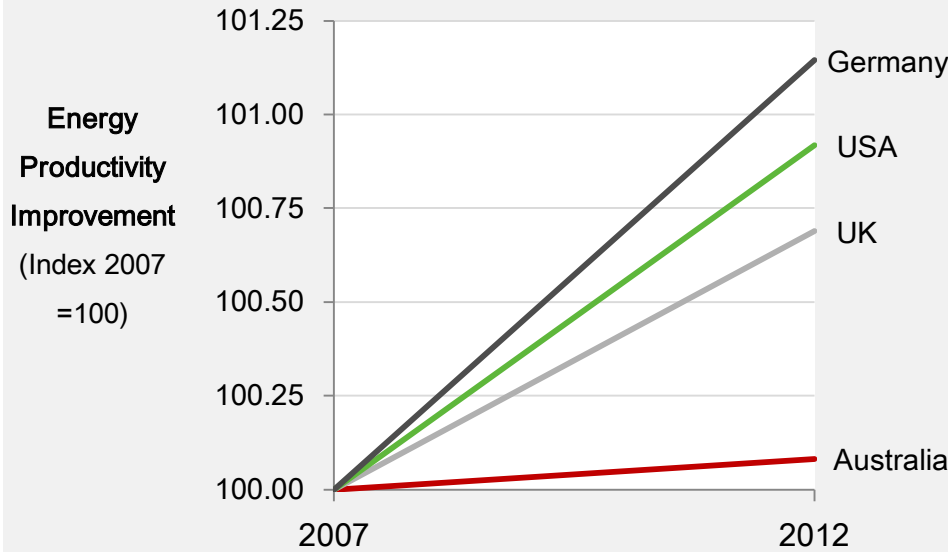
Competitiveness, is the burning platform...

Plunging energy competitiveness (\$GDP/\$energy)

Slowest rate of improvement in energy productivity



the highest energy price increases



2xEP DOUBLING AUSTRALIA'S ENERGY PRODUCTIVITY

Chasing a moving target



Double energy productivity by 2030 (2010)



20% reduction in energy intensity by 2020 (1990) and 27%+ by 2030



Improved energy intensity 153% 1990-2009 and 16% 2011 -2015



Sustainable Energy for All: Double rate of EE improvement by 2030 (to 2.8% pa)



Avoiding 2°C increase for post 2020 action plans



Strengthening voluntary collaboration on EE/EP



DOUBLING AUSTRALIA'S
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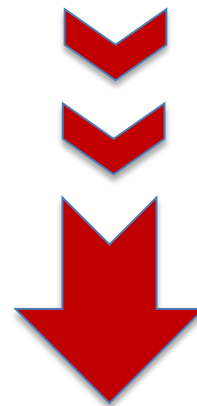


Launch of Global Alliance for EP –
2xEP focus on China, India and Europe

Achieving 2xEP will ensure we keep pace with key competitors and also:

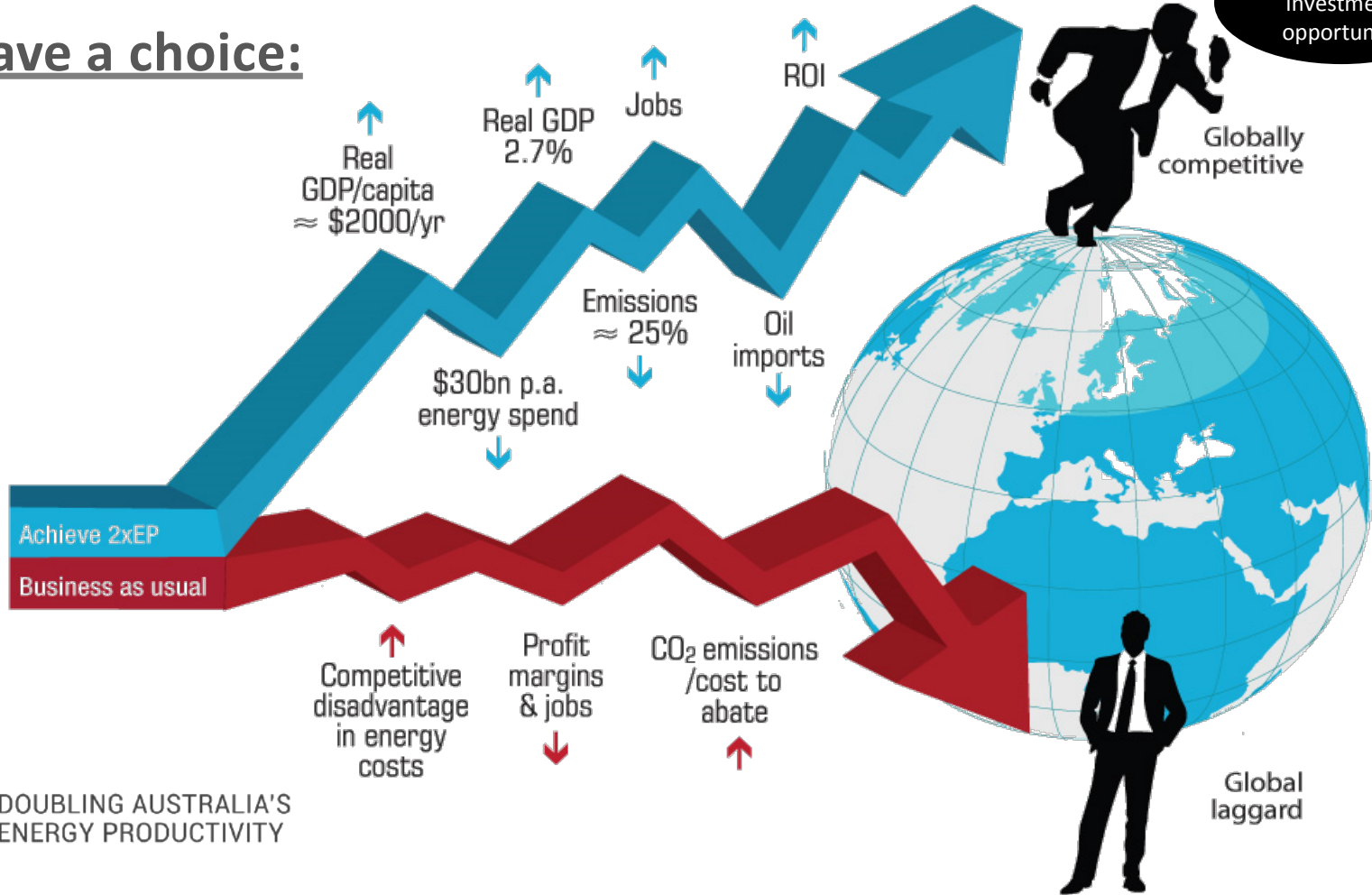


Contribute >50% towards Australia's
2030 emissions reduction target



Reduce Australia's dependency on fuel imports
(and negative impact on the Balance of Payment)

So we have a choice:

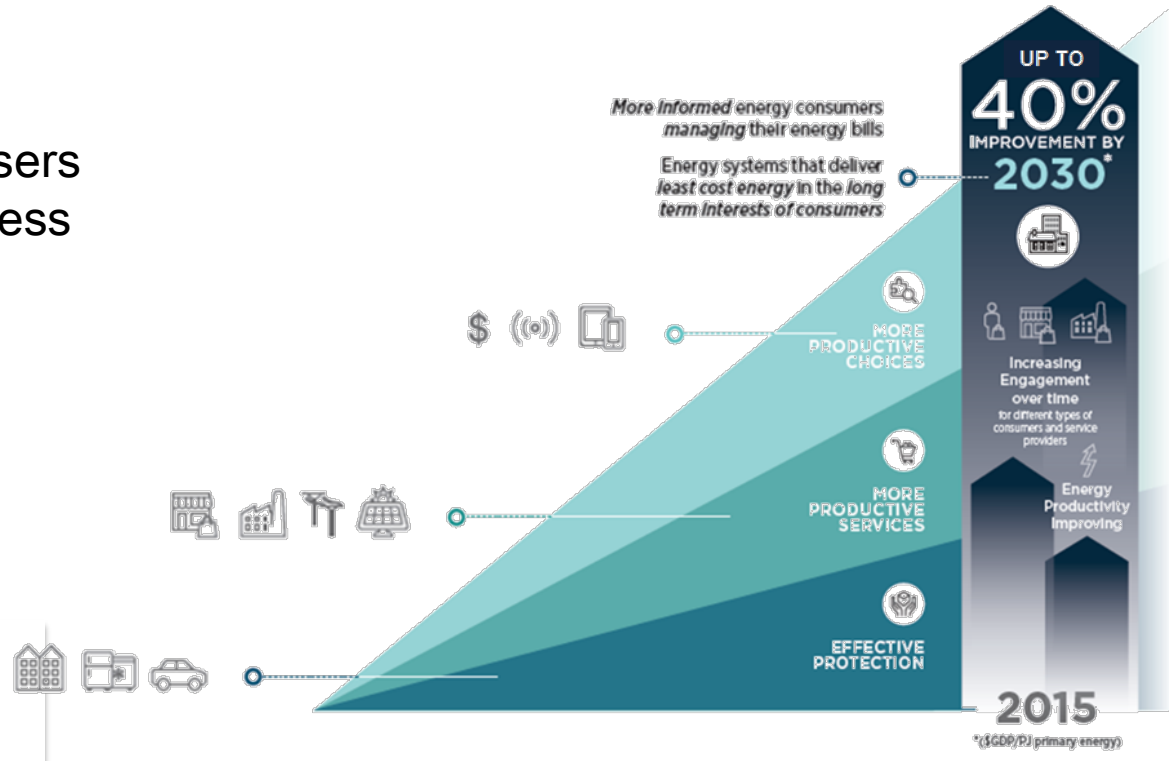


COAG Energy Council has committed to a coordinated National Energy Productivity Plan (NEPP)

Common objectives:

- reduce costs for energy users
- maintain our competitiveness
- grow Australia's economy
- reduce carbon emissions
- improve our sustainability

Agreed July 2015



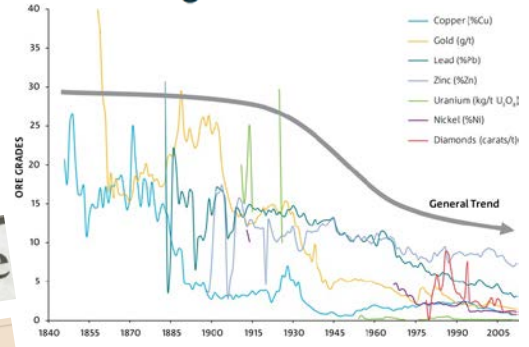
Submission to NEPP – mining

- Broader ARENA mandate to include EP RD&D
- 2xEP Challenge
- Improved information via EEX and outreach
- Incentives for metering and tracking energy
- Review on accelerating investment in EP
- Freight transport initiatives

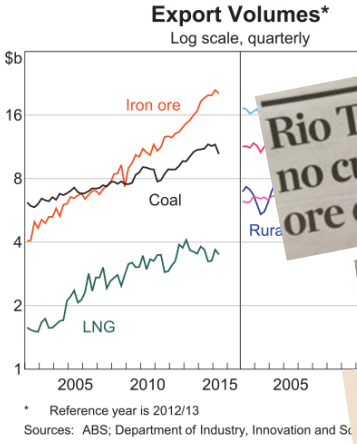
Relevance to the mining industry?



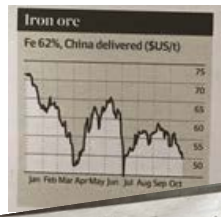
Producing more from less



Newcrest's bug at Cadia eats into output



Rio Tinto vows no cuts to iron ore output



Iron ore to fall further, says Albanese

Coal prices fall to 12-year lows as China, India join demand slowdown

Shorts eye BHP as oil and gas prices remain weak

Glencore reignites port fees war

Coal and gas insist they will survive

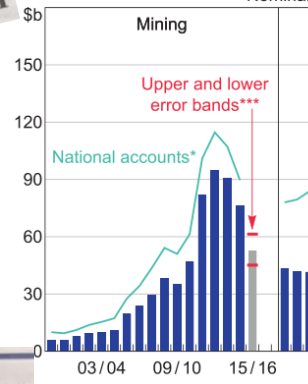
Mineral exploration at rock bottom

China forecasts steep steel slump

Carbon pledges dent coal's growth outlook

Downer warns of more pain ahead from mining slowdown

Measures of Private Business Investment

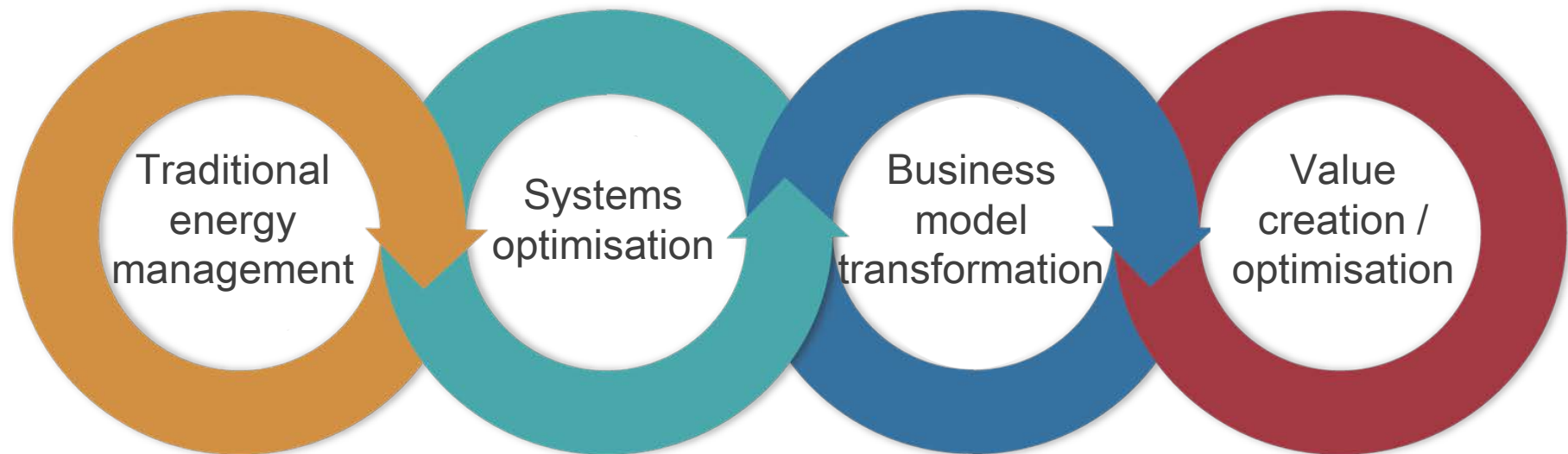


Rio capex cut to shore up pay-outs

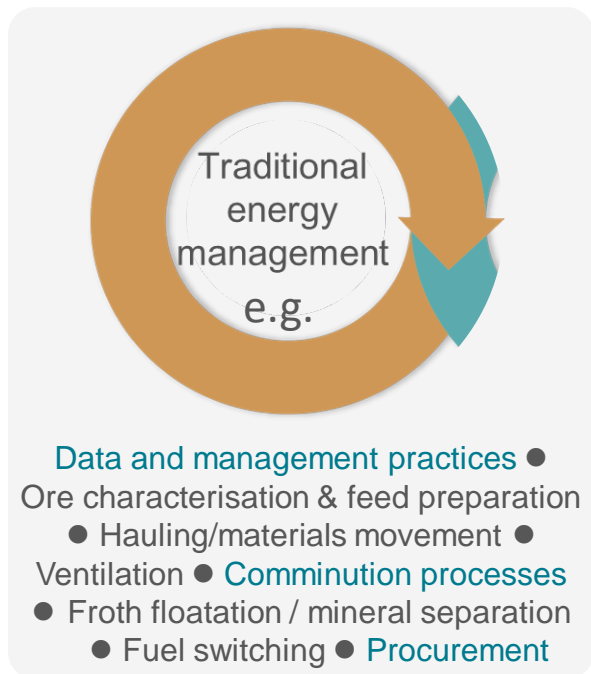
M&A outlook is optimistic

CEO mounts staunch defence of dividend policy

Strategic focus areas for energy productivity

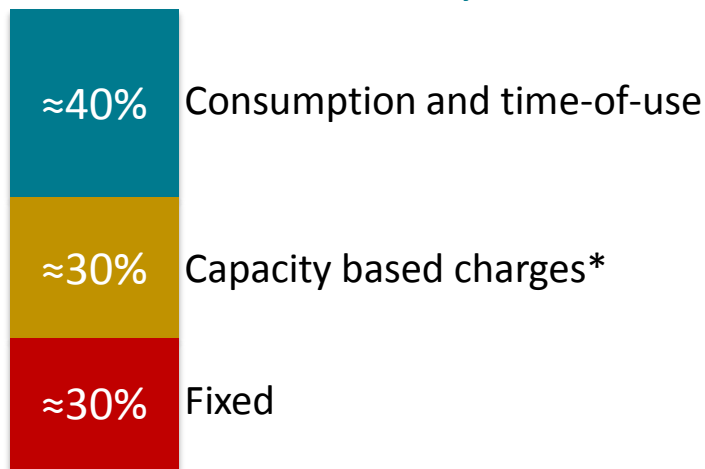


A focus on equipment efficiency and energy budgets



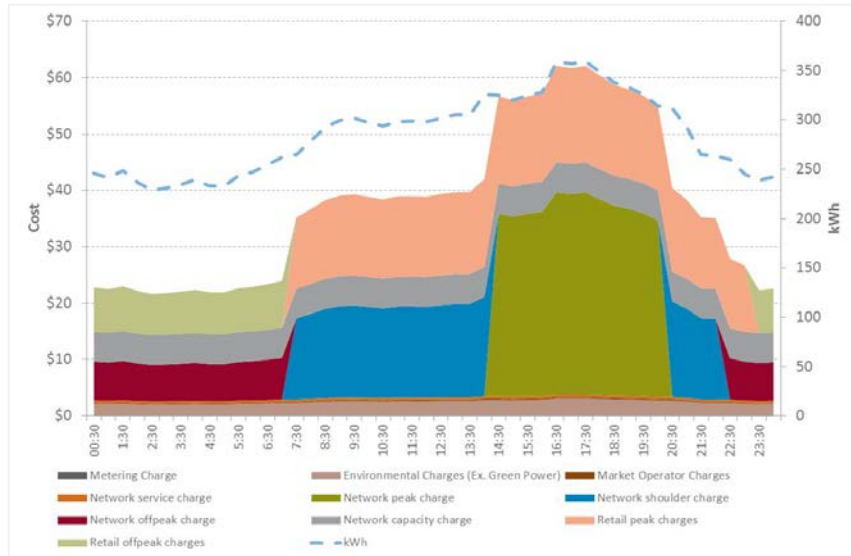
Understanding energy contracts to maximise the financial benefit of energy investments

Illustrative electricity bill determined by:

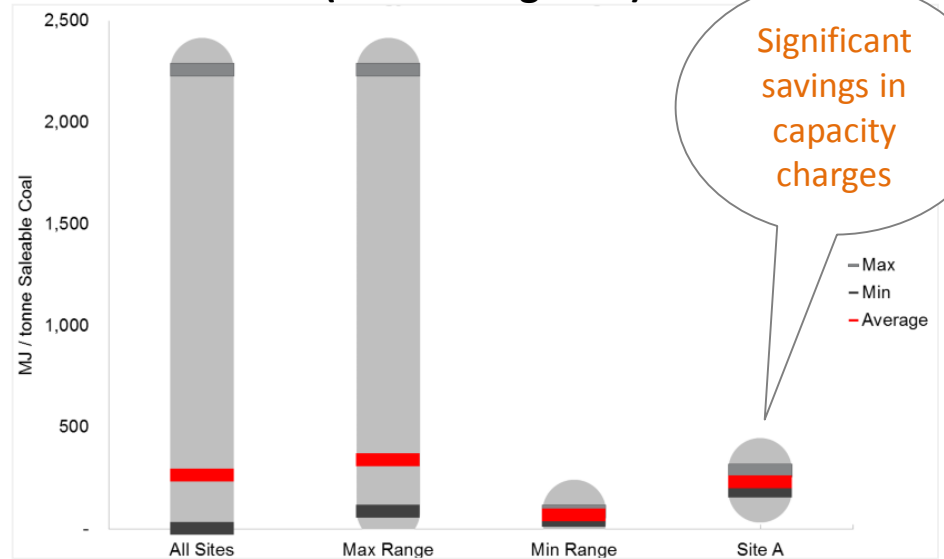


How hard does your energy dollar work?

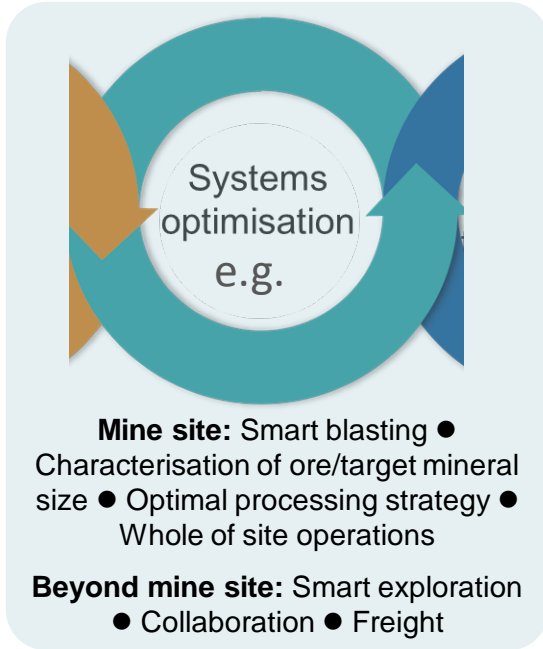
Energy charges based on time of day



Energy performance range benchmarking (coal mining sites)



Energy is a great diagnostic lens to unlock system wide benefits



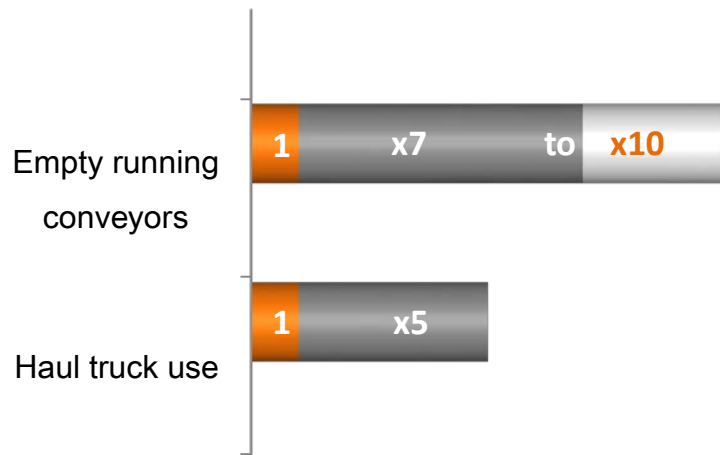
Example:  **AngloAmerican** / CRC **ORE**

Recognise NPV positive energy opportunities, but capital constrained?

Energy may be $\approx 10\%$ of operating cost, but can be the proverbial 'canary in the mine' for whole of site management practices



A recent example from a Western Australian site



■ Energy cost reduction ■ Other \$-benefits

Other \$ benefits?

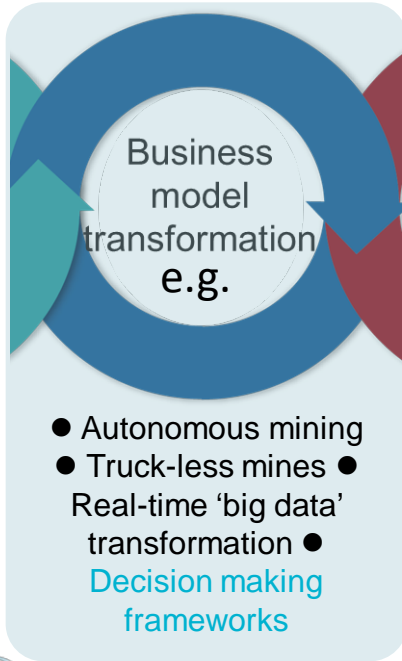
- Reduced maintenance cost
- Extend part / equipment life
- Reduce downtime / increased throughput

Impact?

↓ energy cost + other resource inputs (incl. labour) + ↑ output = ↑ profit

↓ future demand for CAPEX

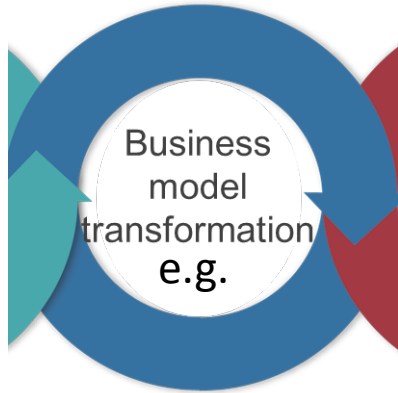
Break traditional capital, labour, energy and throughput relationship



When you run a truck, it takes 10 to 11 employees for every truck. It takes 4½ to five to run it, all the crews that do the maintenance on it, all the camp people that do the camp cleaning and cooking and everything else.

If you go truckless (and use input crushers and conveyors) you do not need any of these staff ... at a time when you see increasing diesel prices ... getting rid of trucks or using fewer trucks is desirable

Demand for new decision making frameworks



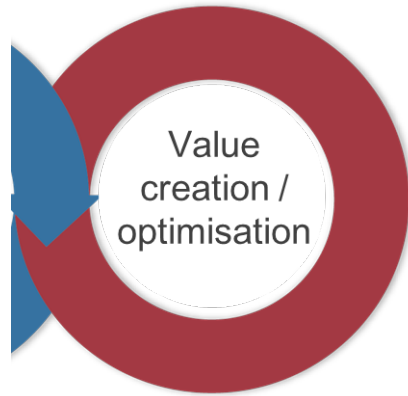
Challenging the prevailing wisdom? e.g.

Sites managed on production metrics
(e.g. maximise mill resource recovery)



Sites managed as profit centres *

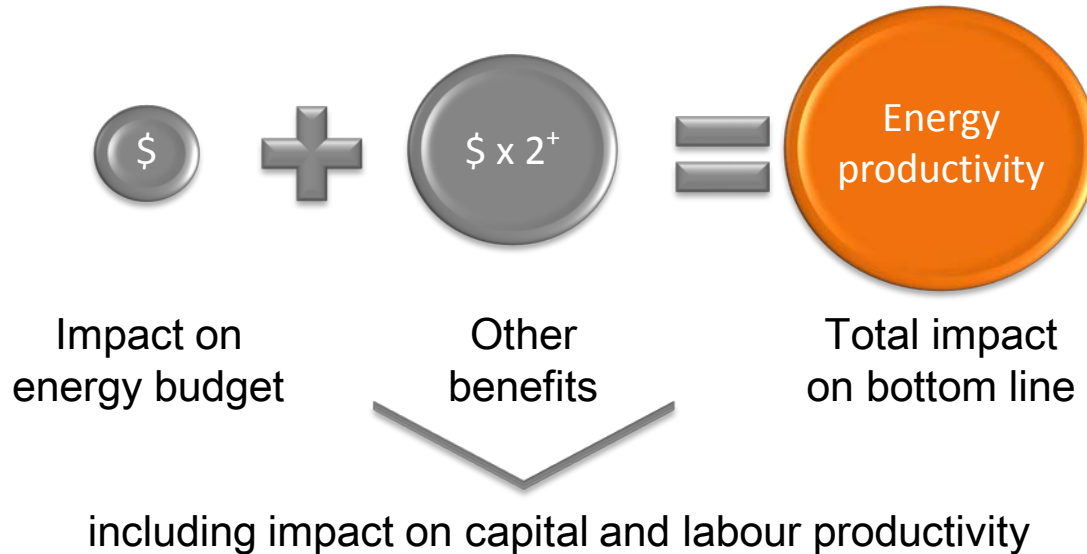
Innovation and best in class standards required for Australian resource companies to sustain growth / global market share



including quality and environmental standards / social licence to operate

- Increased throughput*
- Reduced waste (risk of AMD) *
- Value add (e.g. pelletisation)
- Pre-empt / respond to changes in environmental standards in key markets

Energy is a controllable cost and investment in energy projects can deliver significant non-energy business benefits



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...industry players are getting better at quantifying the benefits beyond the energy budget



**DOUBLING AUSTRALIA'S
ENERGY PRODUCTIVITY**

The logo graphic consists of several overlapping, light blue circular lines that swirl around the text.

2xEP

Doubling Australia's
Energy Productivity



Doing more. Using less.

Questions?



“It is best to be prepared for a low gold price environment, so you are better positioned to tackle an upside in the gold price”

Srinivasan Venkatakrishnan, CEO AngloGold