THE AFFORDABLE ENERGY SOLUTION

HELE COAL TECHNOLOGY COSTED

MINERALS COUNCIL OF AUSTRALIA

A HELE coal-fired plant is more affordable than you think

For the first time, Australian engineering experts have produced a 550-page technical study and cost estimate to build a High Efficiency Low Emissions (HELE) coal-fired power plant in Australia – and it's less than previously published studies and guesstimates.

In the most extensive study of its type, Solstice Development Services and GHD conclude the construction cost of building a 1000 MW ultra-supercritical (USC) plant would be $2.2 billion.

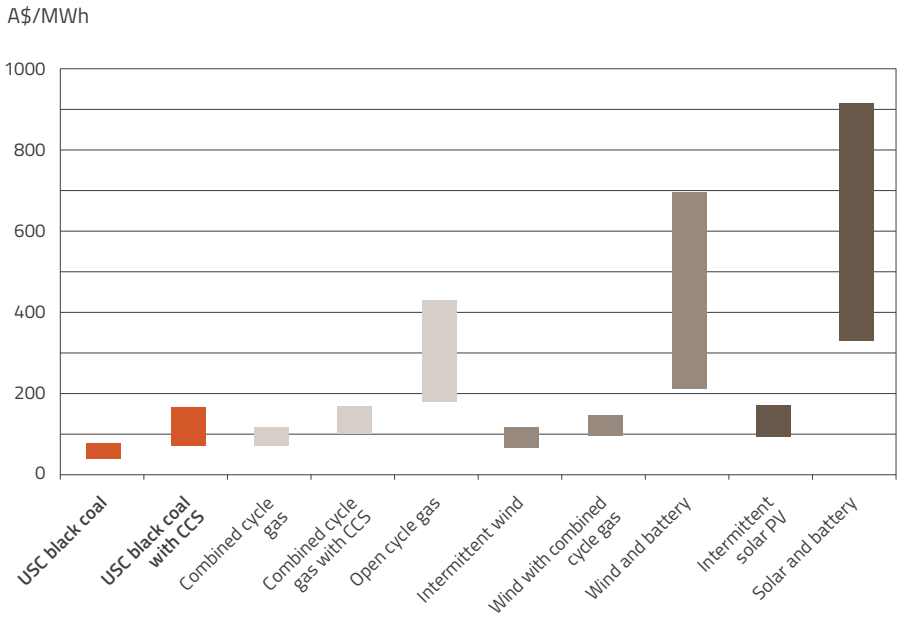
Electricity sourced from a HELE plant is also the cheapest at $40 to $78 MWh compared to gas at $69 to $115 MWh. Intermittent wind ($64 to $115 MWh) and solar ($90 to $171 MWh), blow out further when the necessary cost of battery storage is added.

This study shows significant savings by using existing power station sites and utilising the latest technology from Asia.

A HELE plant costs less to build than the $3 billion of subsidies to renewables every year – and is the lowest cost 24/7 power

HELE electricity is the lowest cost 24/7 power

Electricity generation costs, 2017



Source: Solstice Development Services, *Prospects for a HELE USC coal-fired power station development desktop study,* June 2017; GHD, *HELE power station cost and efficiency report,* June 2017.

8 GW
NEM baseload capacity closing between 2017 and 2030.

$3b
Government subsidies paid to renewables in Australia in 2015-16.

193%
Average state wholesale price increase in the year to March 2017.

$2.2b
The cost of building a 1000 MW USC plant on a brownfield site.

Minerals Council of Australia

Source: Solstice Development Services, 2017; GHD, 2017; MCA calculations.

For reliability's sake, Australia needs a HELE coal plant

Australia is facing an energy shortfall with 8 GW of coal plants to retire by 2030, and a total of 25 GW by 2040. While wind and solar have a role to play, the only affordable, reliable electricity available 24/7 comes from coal-fired plants.

Coal-fired generation is both reliable and affordable. It runs at capacity well over 85 per cent of the time (compared to 20 to 37 per cent for intermittent renewables); it strengthens the grid, not weakens it, and because Australia has the world's highest quality coal in its backyard, it provides national energy security.

Leading HELE technology already anchors electricity production of countries such as Japan and Germany. Fast growing economies of Asia are also building and planning some 1200 HELE plants.

Cost by generation to meet Australia's looming 50,000 GWh shortfall

HELE	Wind	Solar PV
Capacity required	Capacity required	Capacity required
6.5 GW	**15.4 GW**	**28.5 GW**
Construction cost	Construction cost	Construction cost
$14 b	**$33.9 b**	**$59.9 b**

Source: Solstice Development Services, 2017; GHD, 2017; MCA calculations.

Note: 50,000 GWh is the approximate output of Liddell, Yallourn, Vales Point and Gladstone that are likely to close by 2030 (Hazelwood is an additional 11,000 GWh).

New South Wales next to face emergency load shedding

The Australian, 10 February 2017

Blackouts: New South Wales to receive excess electricity from Queensland

The Courier Mail, 10 February 2017

When the wind doesn't blow...

Wind farm output to the NEM on 10 Feb 2017

Summer 2017

40°+

TEMPS • 10 FEB 17

Wind farm capacity %

1PM	2PM	3PM	4PM	5PM	6PM
32%	29%	25%	20%	18%	16%

Note: Figures show wind farm output as a percentage of total capacity.

Source: NEM Watch, www.reneweconomy.com.au/nem-watch/

HELE can help Australia meet its emissions reduction targets

HELE coal-fired generation reduces emissions by up to 50 per cent. A HELE USC emits 0.773 t CO_2 /MWh or 49 per cent less CO_2 than the recently retired Hazelwood brown coal plant or 25 per cent less than subcritical black coal plants which dominate Australia's coal fleet.

If all existing coal plants in Australia upgraded to the best HELE technology this would reduce emissions by 45 million tonnes per year or 25 per cent of National Electricity Market (NEM) coal emissions.

Importantly, HELE USC also sets us on the pathway to adopting CCS which would reduce CO_2 emissions to near negligible levels of 0.106 t CO_2/MWh.

Emissions savings achieved through USC black coal plant deployment

−49%	−40%	−25%
Replacing Hazelwood brown coal plant.	Replacing subcritical brown coal plants.	Replacing NEM coal fleet in 2017.

Source: Solstice Development Services; GHD, 2017; MCA calculations.

As the world's largest coal exporter, we have a vested interest in showing that we can provide both lower emissions and reliable baseload power with state-of-the-art, clean coal-fired technology.

The Hon Malcolm Turnbull MP
Prime Minister of Australia
National Press Club address, 1 Feb 2017

Sources:

- Solstice Development Services, *Prospects for a HELE USC coal-fired power station development desktop study*, June 2017.
- GHD, *HELE power station cost and efficiency report*, June 2017.

www.minerals.org.au