“Into Reverse Gear ?”

Australian Export Coal Forecast & Impact of Carbon Pollution Reduction Scheme

Bede Boyle

McCloskey Asia Pacific Coal Outlook Conference 2009

A presentation in 3 parts

Part A - Australian Export Coal Forecast

- **Asia is Turning to Coal**

Part B – Carbon Pollution Control Scheme

- **Economic Impact on Coal Industry**

Part C – Perenia Carbon Solutions

- **Embedding Carbon Credits in Coal Sales**

Out of Poverty- a report on Coal’s Contribution to China as a Model for the Developing World

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A China Out of Poverty

“ Every single one of the United Nations’ Millennium Development Goals require access to electricity as a necessary prerequisite” Global Energy Institute, 2008

“ Electrification in China is a remarkable success story … it is part of its poverty alleviation campaign” IEA, 2007

A China Out of Poverty

The Energy Driven Sea Change in China

In 1970 China was the world's economic and social backwater:

- **Over 600 million people lacked electricity**
- **The under 5 death rate was 120 per 1,000**
- **Only 1 in 500 people had a telephone**
- **The GDP per capita was $122**

In just 15 years China provided access to electricity to over 450 million people = 1.5 times the population of the United States.

A China Out of Poverty

The Energy Driven Sea Change in China

Utilisation of coal enabled China to double energy output from 1990 to 2005 with coal contributing 65% to the increase.

"China is the largest developing country in the world, and developing the economy and eliminating poverty …remain the main tasks for the Chinese Government"

State Council of the People's Republic of China, 2007

A China Out of Poverty

The Energy Driven Sea Change in China

Coal's socioeconomic track record in China, in the 15 years from 1990 to 2005:

- **Access to electricity increased 76%**
- **GDP increased 300%**
- **Food production index increased 88%**
- **Abject poverty decreased 45%**
- **Infant mortality declined 39%**
- **UN Human Development Index increased 22%**

A Asia is Turning to Coal

Despite concerns with global warming Asia is turning to coal

The prevalence of coal-fired power generation in Asia has increased over the past decade as a result of rapid energy demand growth.

This trend is set to continue over the medium to long term with extensive plans for the expansion of coal-fired electricity capacity

– around 580gigawatts requiring

1.7 to 2.4 billion tonnes of coal by 2030.

A Asia is Turning to Coal

Planned additions to coal-fired capacity in Asia - ABARE

	MW	Implementation
China	280,500	2009 – 2020
Viet Nam	116,000	2007 – 2025
India	77,000	2008 – 2017
Indonesia	50,000	2007 – 2026
Pakistan	19,710	2006 – 2030
Korea, Rep. of	8,450	2005 – 2020
Cambodia	4,500	2008 – 2020
Philippines	4,360	2008 – 2016
Sri Lanka	4,100	2007 – 2016
Thailand	4,000	2008 – 2018
Japan	2,940	2006 – 2016
Malaysia	2,670	2007 – 2014
Bangladesh	2,400	2008 – 2016
Laos	1,800	2008 – 2014

A Asia is Turning to Coal

If only 20% (116 gigawatts) of the planned capacity of 580 gigawatts is operational before 2014 this would require an estimated additional 340Mtpa of black coal.

Fuel consumption for a 1000MW power station with 35% efficiency and 75% availability is:

- **Bituminous coal (6500kcal/kgnar) 3.0Mtpa**
- **Sub-bituminous (3000kcal/kgnar) 4.2Mtpa**
- **Brown coal (2250kcal/kgnar) 8.6Mtpa**

A Asia is Turning to Coal

Australian Export Coal Forecast to 2014 (Mt)

ABARE	2000a	2008a	2014f
Metallurgical	101	135	162
Thermal	86	115	163
TOTAL	197	250	325

This 75Mtpa forecast growth by ABARE from 2008 to 2014 is driven by developing Asia.

"Given mine and coal chain developments exports could exceed 400Mtpa in 2014-15."

B Boyle

A Asia is Turning to Coal

Australian Export Coal Chains 2014-15		Mtpa
New South Wales	Newcastle	140
	Port Kembla	15
Queensland	Abbot Point	40
	Mackay	130
	Gladstone	88
	Brisbane	7
TOTAL		420

" Given mine and coal chain developments exports could exceed 400Mtpa in 2014-15, 150Mtpa growth from 250Mt in 2008." B Boyle

B Economic Impact of CPRS

Australian Government

- **Ratified Kyoto Protocol in December 2007**
- **Committed to reducing emissions by 60% of 2000 levels by 2050**
- **Proposed Carbon Pollution Reduction Scheme**

  - emissions reduction of 5% by 2020

  - cap and trade: with more permits to be auctioned than in any other scheme

  - Coal mine fugitive emissions covered

  - Compensation for coal-fired power stations (mainly brown coal)

B Economic Impact of CPRS

Federal Opposition

- Rejected revised CPRS legislation in upper house (Senate) in November 2009

Australian Government

- Following Copenhagen Summit in December 2009 the Government will re introduce CPRS legislation to parliament in February 2010.

B Economic Impact of CPRS

Modeling commissioned by the Australian Coal Association demonstrates that the black coal industry will incur $15billion in carbon costs over the first 10 years of the CPRS from 2011 to 2021, starting at a carbon price of $25/tonne CO2e.

B Economic Impact of CPRS

Carbon Pollution Reduction Scheme (CPRS) as proposed by government will impact on the competitiveness of Australia's export mines:

1. **On an individual mine by mine basis**
   depending on how "gassy" the mine is and the relative cost of permits

   2/3 mines < A$5/tonne coal (average $2.50)

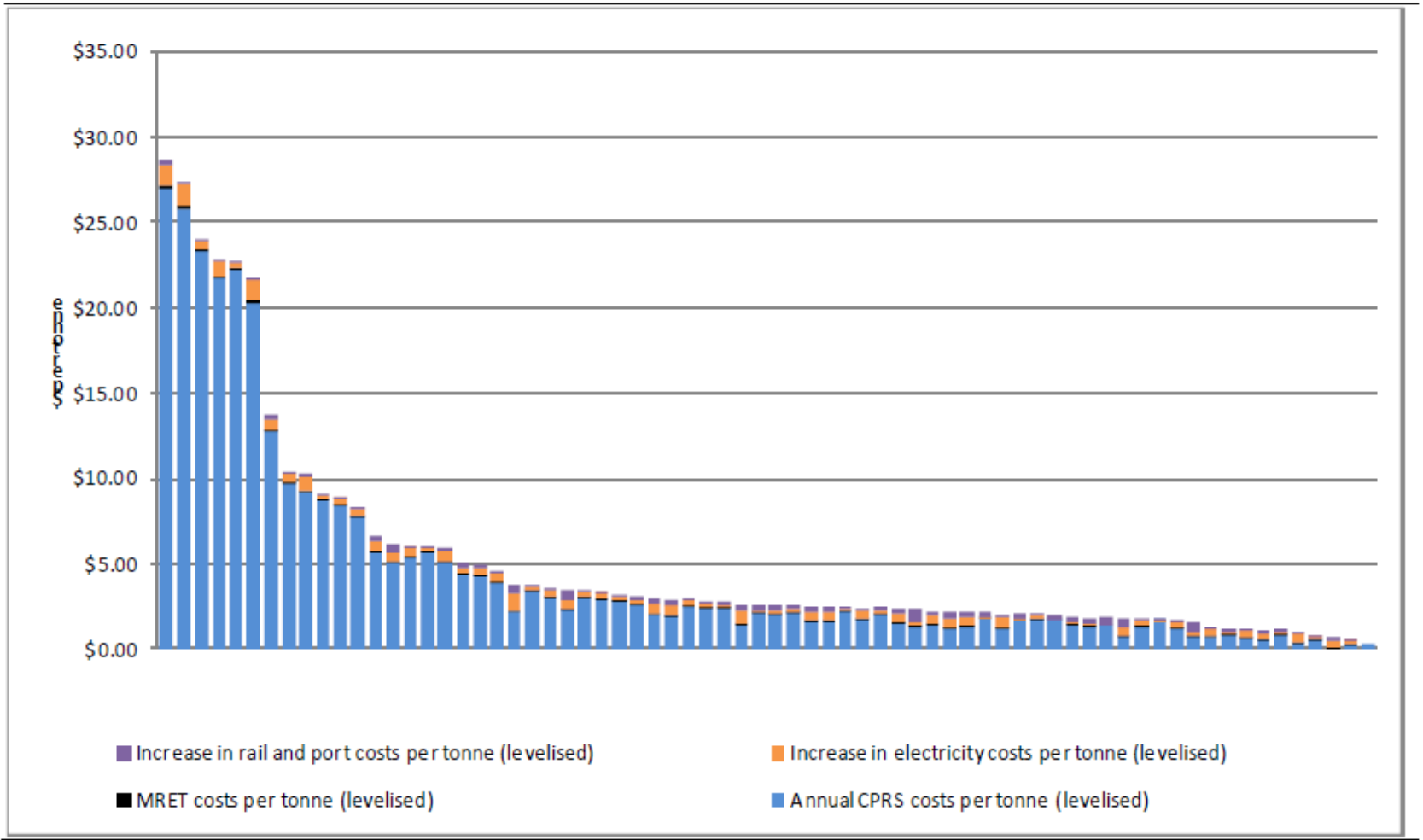
   11 mines A$5 to A$20/tonne coal

   6 mines > A$20/tonne coal

2. **On the Australian export coal industry**
   compared to its competitors who do not have comparable cost impact of emissions

B Economic Impact of CPRS

Figure 4 **Mine by Mine Levelised Increased Costs/Tonne from Emissions Pricing and RET before Coal Sector Adjustment Assistance – Reference Case (timeframe to 2026, 2008-09 $)**



a Data source: *ACIL Tasman research*

B Economic Impact of CPRS

Under the Coal Industry Assistance Scheme $1.5billion transitional assistance will be provided over 5 years in two components:

1. **$250m per annum over 5 years to the most emissions intensive "gassy" mines defined as above 0.1tonneCO2e / saleable tonne**

   = A$2.50/ tonne coal @ A$25 carbon price

2. **$270m per annum over five years for methane abatement activity:**

   companies to fund ¾ cost of project

The industry will still have cost impost of A$3.5billion over the first 5 years of CPRS.

B ACA – Coal Industry View

The Australian Coal Association has submitted modeling to the government to demonstrate

- **Coal "qualifies" under Emissions Intensive Trade Exposed industry (EITE) threshold of 1330 tCO2/$million revenue**

ACCA believes that as an EITE industry:

- **Coal should not be excluded from**
  - **- 60% permit allocation or**
  - **- $8 billion in transitional assistance ($800m per annum over 10 years)**
- **And fugitive emissions should be excluded from CPRS - as in US and Europe**

B Abatement Options for Anglo

Seamus French CEO Anglo Coal Australia provided the following timeline of abatement options at a presentation to the Minerals Council of Australia in June 2009.

"the reality is that few abatement options currently exist to abate coal mining greenhouse gasses , and options that might be available will take significant periods to implement."

B Abatement Options for Anglo

Carbon Source	Reduction Lead time	How ?
Measurement of fugitives	3 years	600 measurement points across all mine sites
Underground rich methane	5 years	20MW expansion of existing power stations $50-100m
Underground vent air methane	7 years	Installation of 20 voxidisers +$200m
Fuel	+10 years	No technology to retrofit 300 fleet
Power	+10 years	No technology available
Fugitive open-cut	+10 years	No technology available

Seamus French

B Economic Impact of CPRS

CPRS cost A$12/tonne	Thermal Coal US$72/tonne	Metallurgical US$128/tonne
Exchange Rate US$/A$	Margin after cash, CPRS, depreciation	Margin after cash, CPRS, depreciation
US$0.60	A$42.7	A$202.7
US$0.80	A$12.7	A$47.7
US$0.95 Analysis by	-A$2.3 Don Barnett	A$22.7 MINEC

B Economic Impact of CPRS

"Analysis supports a minimum projected thermal price of US$80/tonne in 2011 to maintain Australian industry profitability.

The downside of this projection is that Australian thermal coal competes with Indonesia which will not have the added burden of a cost of carbon"

B Boyle

Perenia Carbon Solutions

Perenia Carbon is a joint venture between

- **Mitsui & Co., Ltd - one of Japan's leading global investment and trading houses**
- **SMEC – Australia's Snowy Mountains Engineering Corporation**
- **Pacific Hydro – Australia's premier renewable energy company**

Perenia has global coverage and offers clients complete carbon solutions to manage carbon risks, and identify and realize opportunities.

C Perenia Carbon Solutions

Perenia Carbon Services includes:

- **Carbon Management Solutions**
- **Sustainable Energy Solutions**
- **Clean Development Mechanism (CDM) and Joint Implementation (JI) project registration and optimization**
- **Transaction services for tradable Certified Emission Reductions (CER's) generated by CDM which can be embedded in Coal Sales**
- **Project Development and Delivery services for emission reduction projects**
- **Technology identification and assessment**

C Perenia Carbon Solutions

Perenia recent CDM projects:

- **Lihr 55MW Geothermal Project where Perenia will assist owner manage 280k CERs / annum**
- **Jorethang Loop 96MW project where Perenia will manage and broker over 400k CERs / annum**
- **Pacific Hydro / La Higuera JV hydro project in Chile will generate about 450k CERs / annum**

Thank you

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