# Indonesia's Coal Industry
# Past Accomplishments – Future Prospects

Bart Lucarelli
Roleva Energy
Coal Trans Asia
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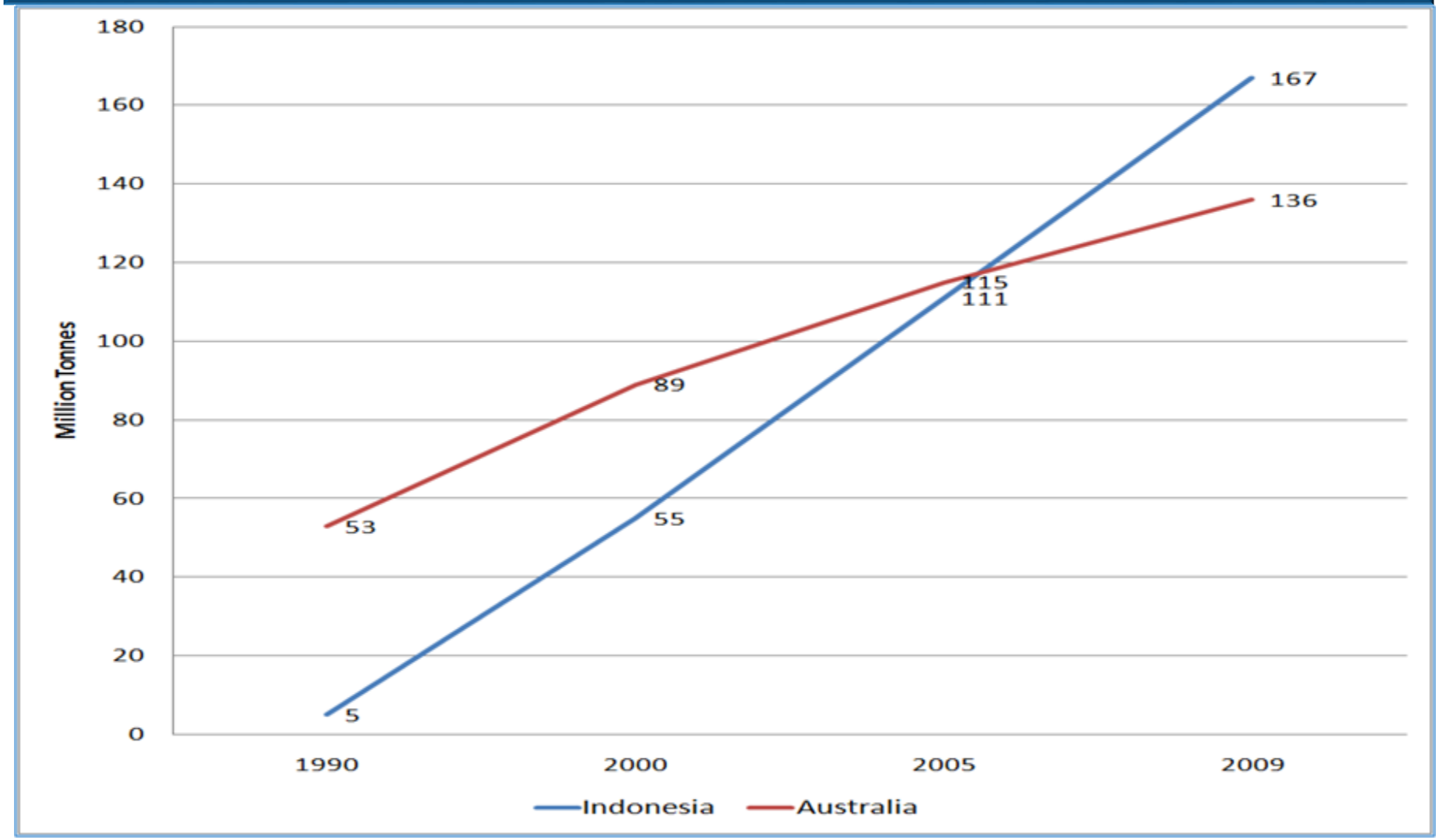
# Topics

- Competitive Strengths & Weaknesses of Indonesia's Steam Coal industry
- Major Questions facing Indonesia as the World's #1 Steam Coal Exporter
  - Can Indonesia's Coal Industry meet expected growth in the domestic and export sectors?
  - How will the shift to low rank coals affect its steam coal exports?
  - Are new Australian steam coals from Queensland a threat to Indonesia's steam coal industry?
  - Might the regulatory uncertainty surrounding Indonesia's new Mining Law seriously damage Indonesia's reputation as a reliable coal supplier?
- Summary

# Indonesia only started exporting steam coal in 1990 but in late 2005, it became the World's largest steam coal exporter.



# Competitive Strengths & Weaknesses of Indonesia as a steam coal exporter (as compared to Australia)

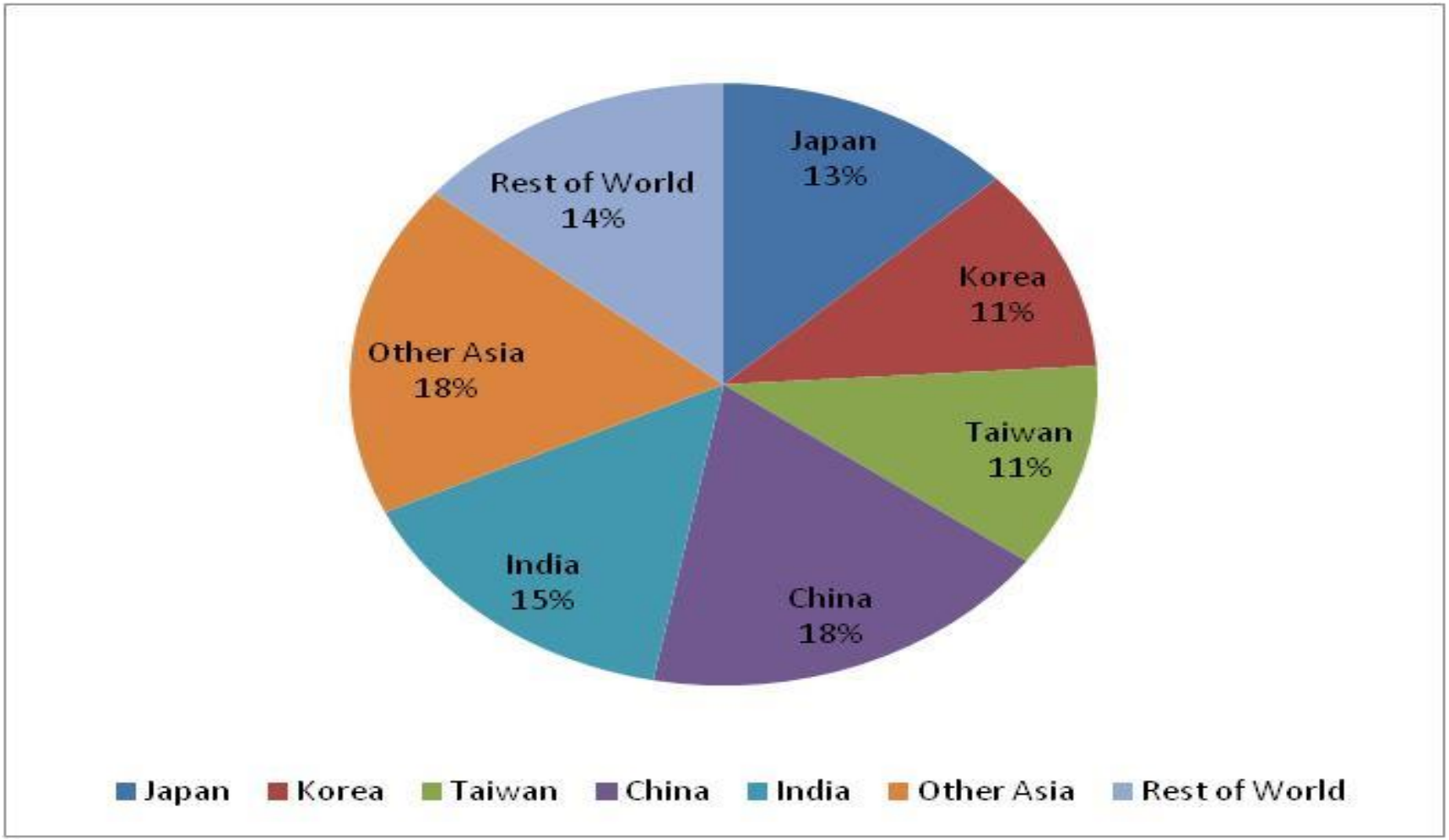
## Strengths

- Highly Diversified Market
- Sufficient Reserves to meet expected demand
- Proximity to Major Coal Demand Centers
- Flexible and Modular Inland Transportation Systems

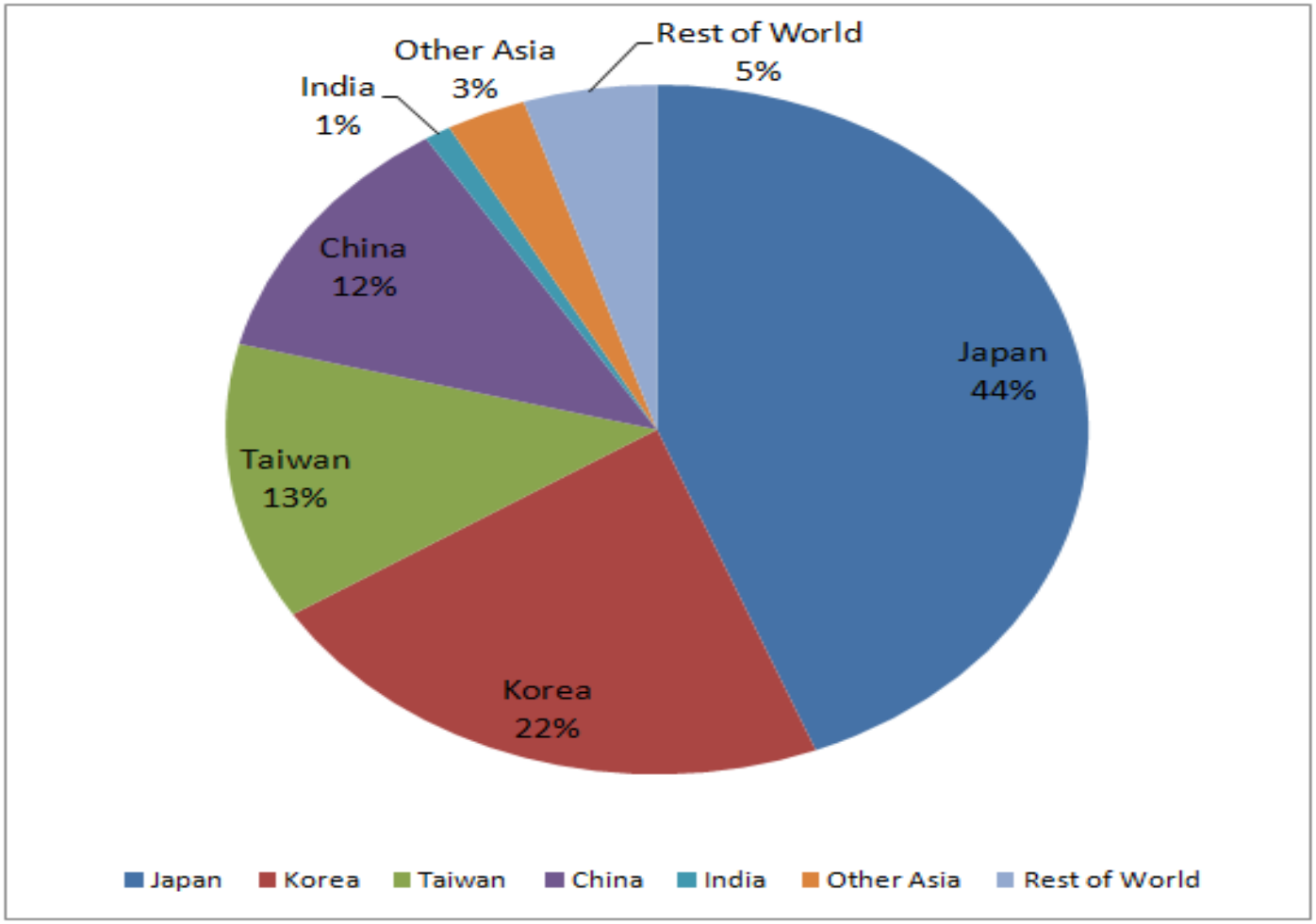
## Weaknesses

- Lower CV, Higher Moisture Coal
- Political Risk and Regulatory Uncertainty

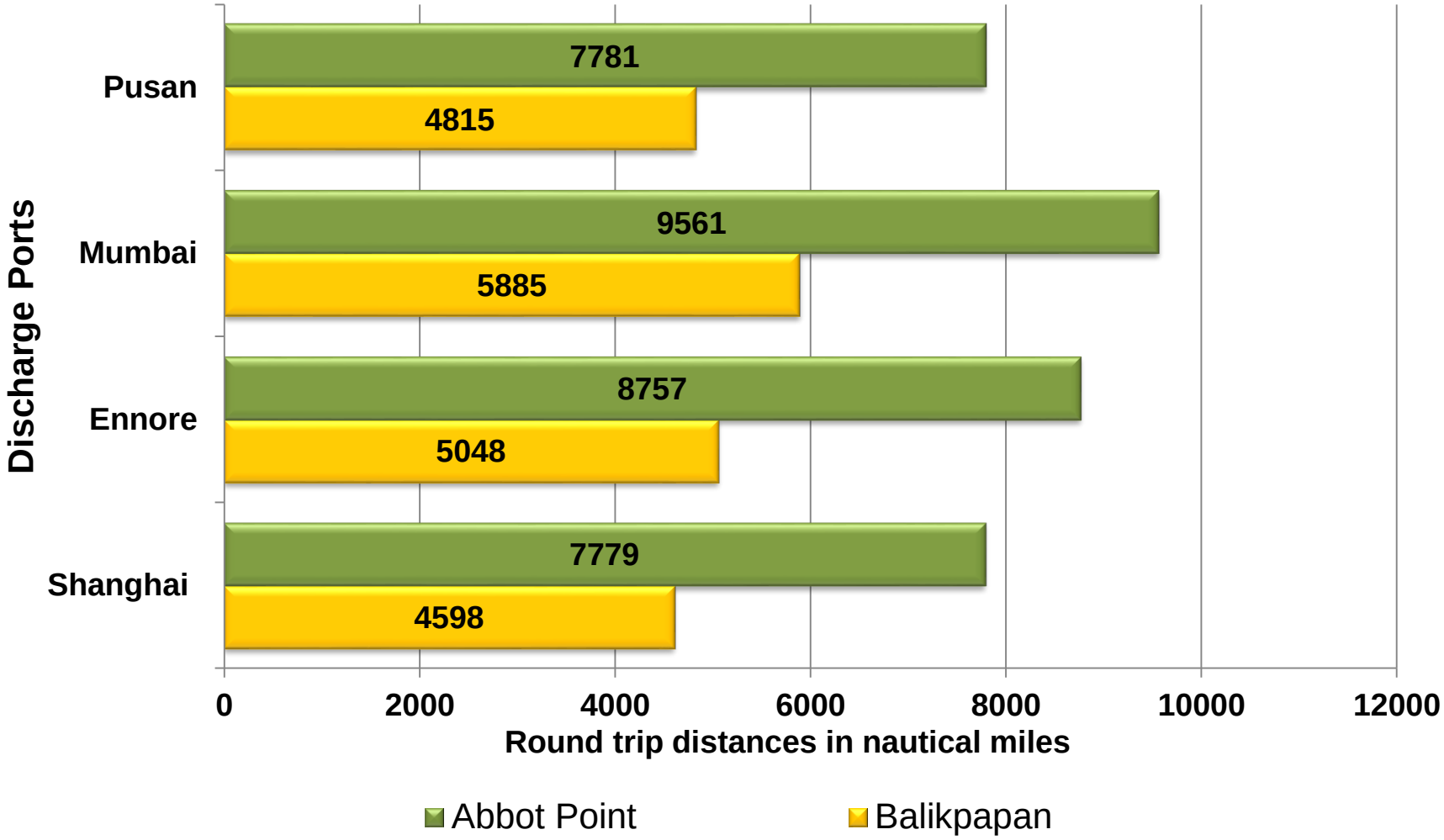
# Indonesia's 2009 coal exports were evenly spread across Asia while….



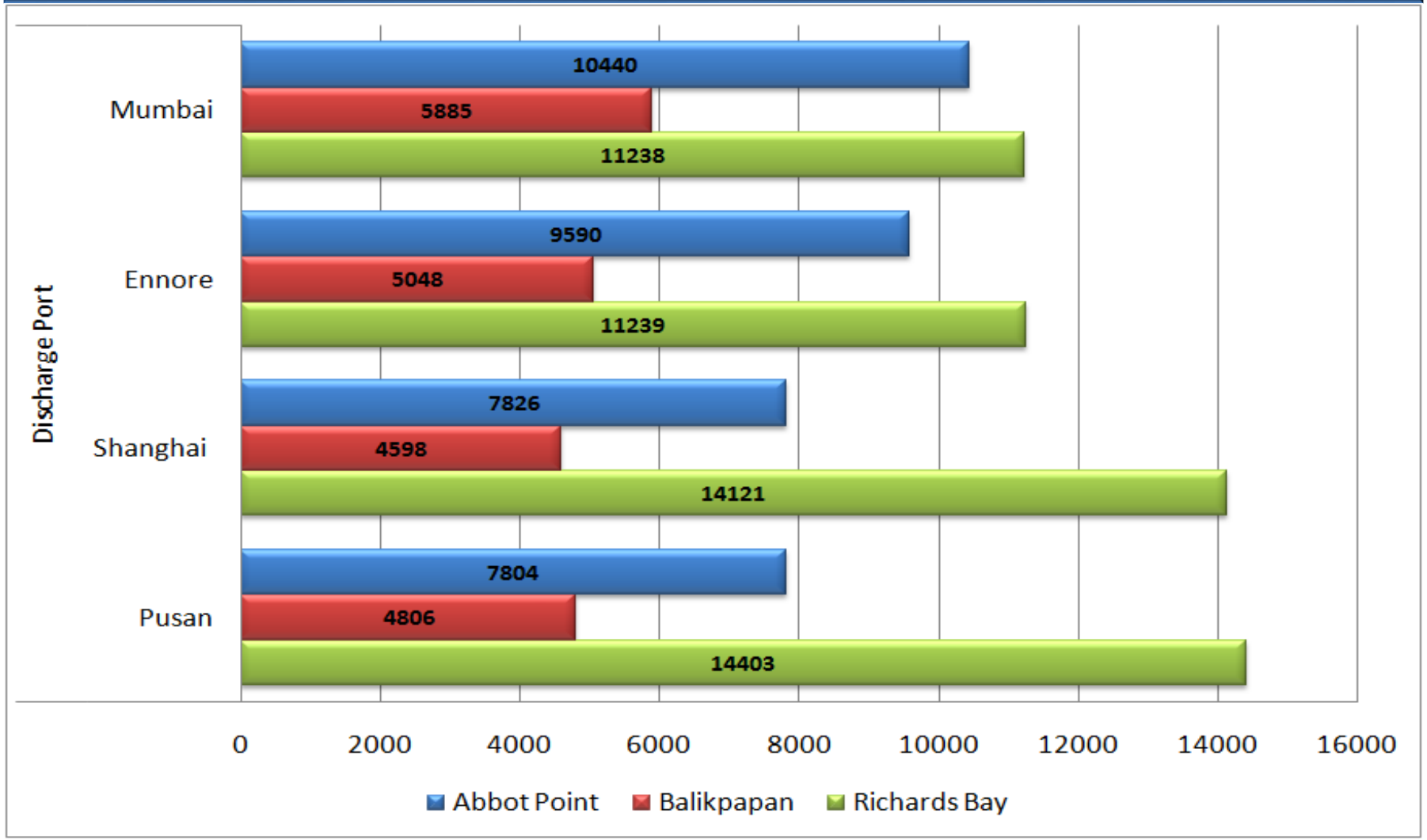
# ….. Australia's steam exports in 2008 were heavily concentrated in North Asia.



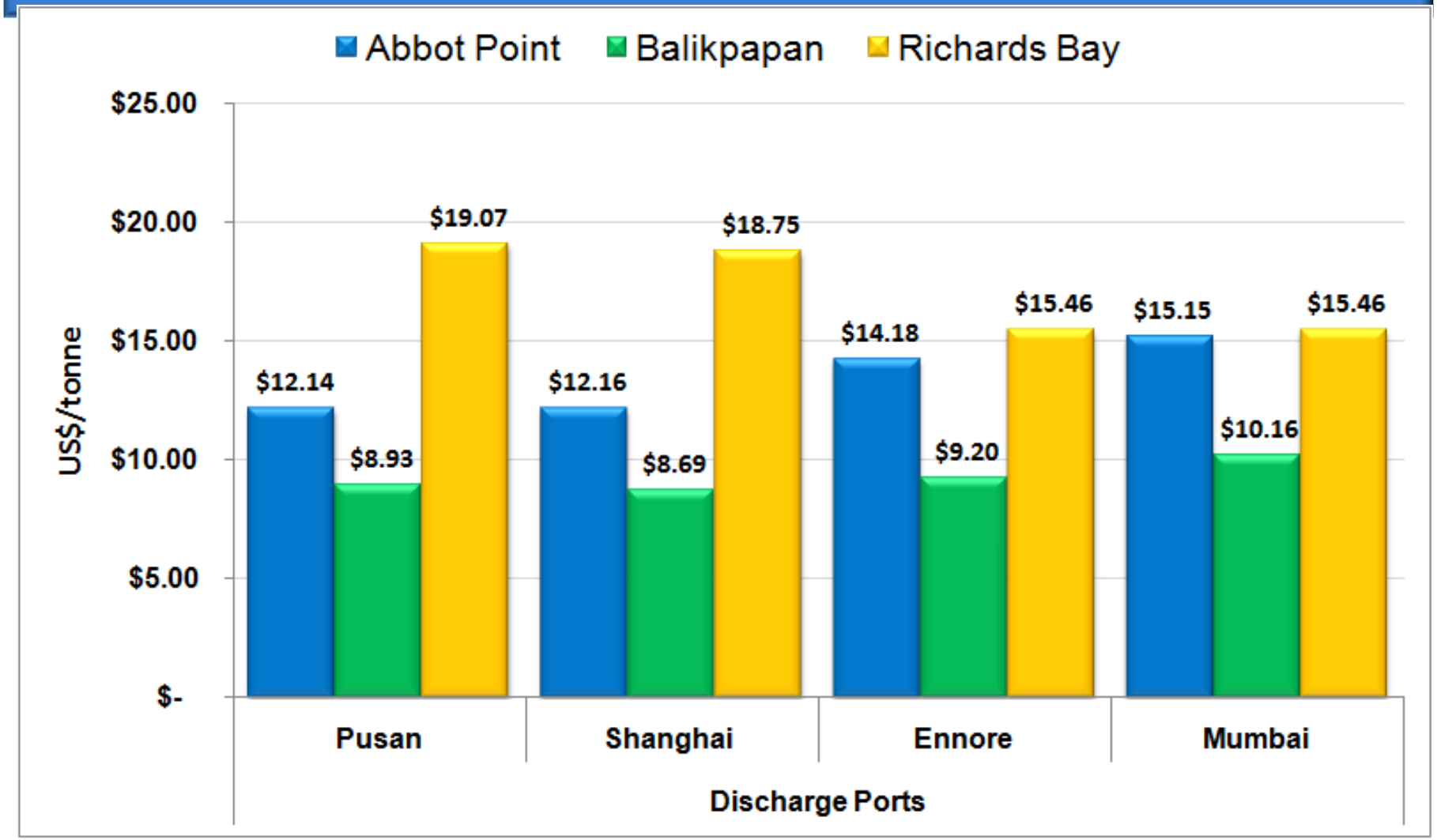
# Indonesia is closer to all major Asian markets than Australia, resulting in a significant savings in Indonesian shipping costs



**Shipping companies usually assumes a sea vessel is "ballasted into position" from an open position when preparing a freight rate bid. For Cape vessels with Qingdao as the "open position" port, Indonesia enjoys an even greater distance advantage.**



# Indonesia's freight rate advantage provides it with a significant competitive advantage over RSA & Australian steam coal industries
Note: Freight rates expressed on a raw tonnage basis



Indonesia's inland transport system uses river barges, trucks, overland conveyors and floating facilities. The system is very flexible, can be expanded quickly and has a low capital cost but has made Indonesia's coal industry heavily dependent on diesel.

(Photos courtesy of PT Adaro)

Australia's steam coal industry relies on fixed rail transport with each train hauling 6,000 – 12,000 tonnes each to move coal from the mines to fixed ports such as…….

# … the port of Gladstone with a 2009 nameplate capacity of 79 mtpa but with plan to expand to 142 mtpa by 2020

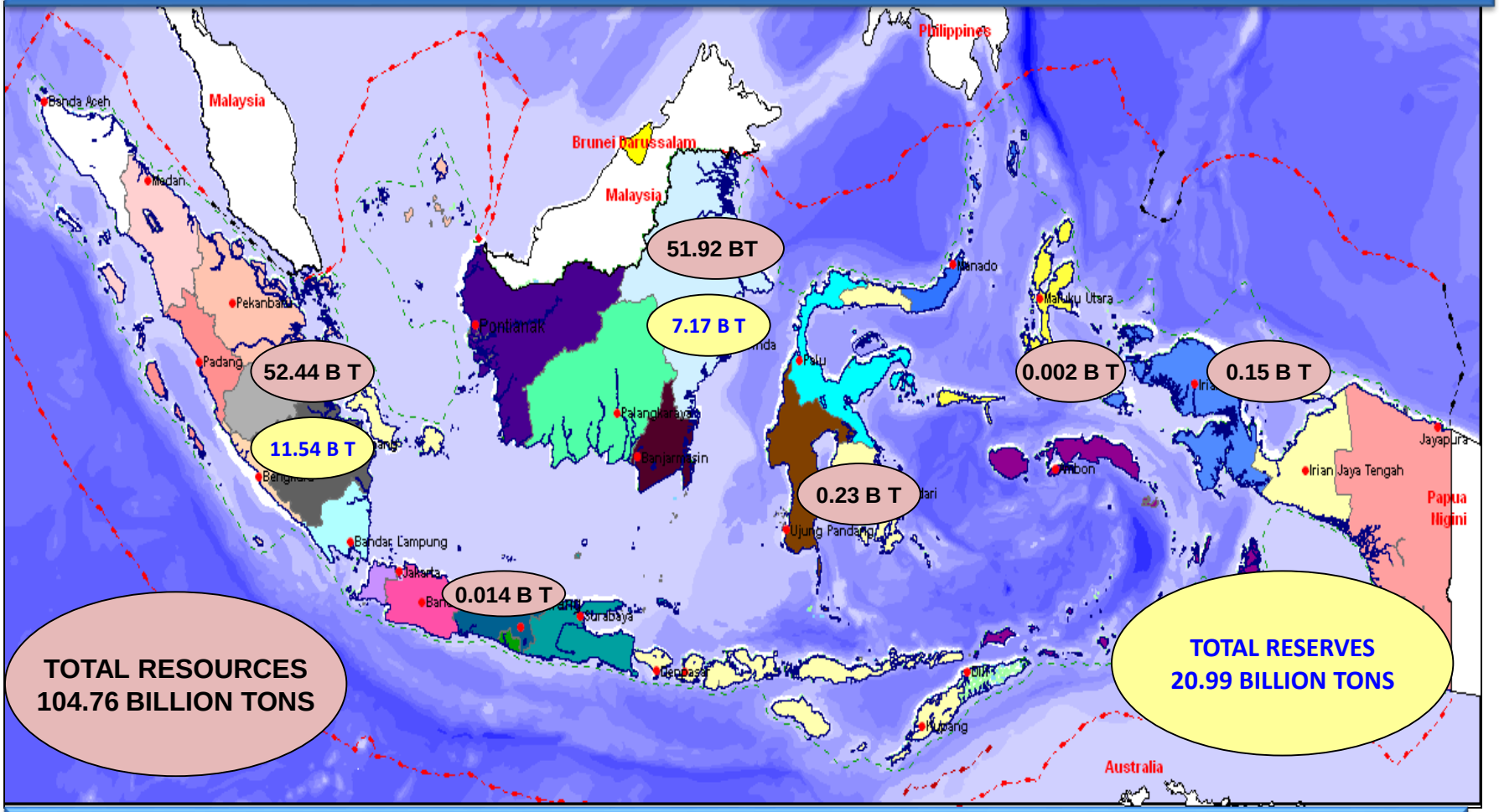
# Can Indonesia Meet Both Domestic and Export Requirements for Steam Coal?

# PLN's crash program and new IPP projects will lead to a very large increase in domestic coal demand by 2015 but strong export growth is still possible. (figures in million tonnes)

| Coal market | 2008 | 2012 | 2013 | 2015 |
|---|---|---|---|---|
| Power | 30 | 60 | 70 | 85 |
| Other Domestic | 25 | 36 | 39 | 46 |
| **Total Domestic Demand** | **55** | **96** | **109** | **131** |
| Exports | 158 | 212 | 229 | 267 |
| **Total Demand** | **213** | **308** | **338** | **398** |

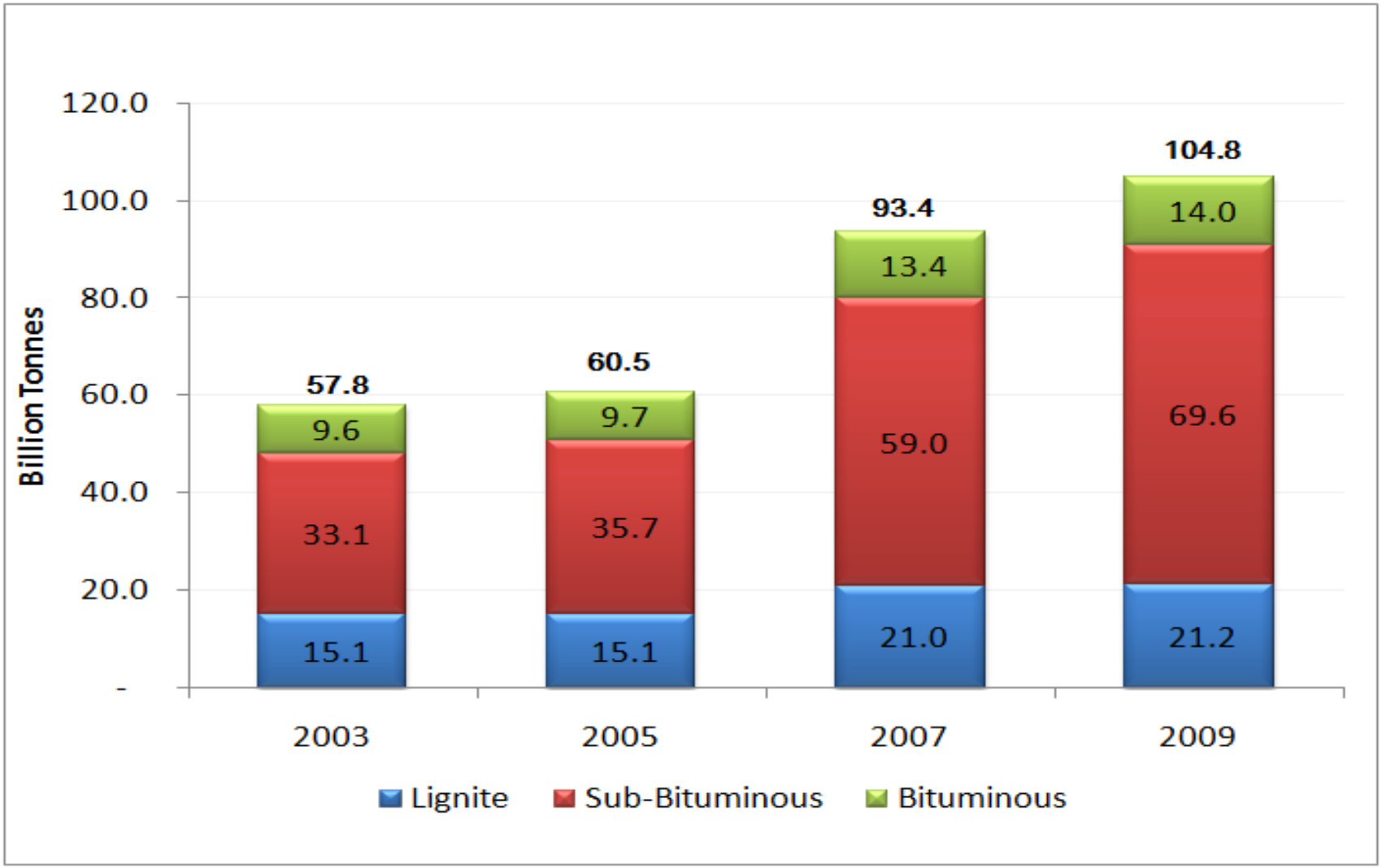
Sources: Domestic power: James T. Booker and Associates
Exports & Other Domestic: UBS

# MAP OF INDONESIA'S COAL RESERVES AND RESOURCES, 2009




Note : Coal Resource Estimates for South Sumatra, East Kalimantan & South Kalimantan are based on Joint NEDO – MEMR Study (2007 – 08)

# NEDO-MEMR Joint Study resulted in 2007 resources increasing by 54% over 2005 figures due to increase in hypothetical sub-bit resources. MEMR increased sub-bit resources by an additional 12% in 2009



# My View: Indonesia's coal industry has the "demonstrated ability" to meet future domestic steam coal requirements as well as future growth in its export markets

- Indonesia will experience a more gradual increase in domestic coal demand than PLN initially forecast.
- Indonesia's coal producers have demonstrated the ability in the past to rapidly increase their production levels to accommodate demand growth. No reason it cannot do so in the future .
- Indonesia's Coal Reserves are more than adequate to meet this forecasted demand into the foreseeable future.
- Shortages , if they do occur, are likely to result from PLN's refusal to pay the market FOB price for Indonesian coal.

# Will Indonesia shift to low rank coals (not clear from 2007 MEMR-NEDO Study) and if so, what are the implications of this shift for Indonesia's export markets.

## Sub-bituminous coals

- Resource Base
  - Measured: 12 billion tonnes
  - Indicated + Inferred: ~29.8 billion tonnes
- Reserves: 11.2 billion tonnes
- Measured resources sufficient to last 55 years at current production rates
- But a number of Indonesia's major coal suppliers claim that they are already sold out of their sub -bituminous coals

**Typical Specification**

- CV : *4700 – 6000 kcal/kg*
- S : 0.2% – 0.6%
- Ash : 3.0% – 7.0%
- TM : *20.0% – 28.0%*

## Low rank coals

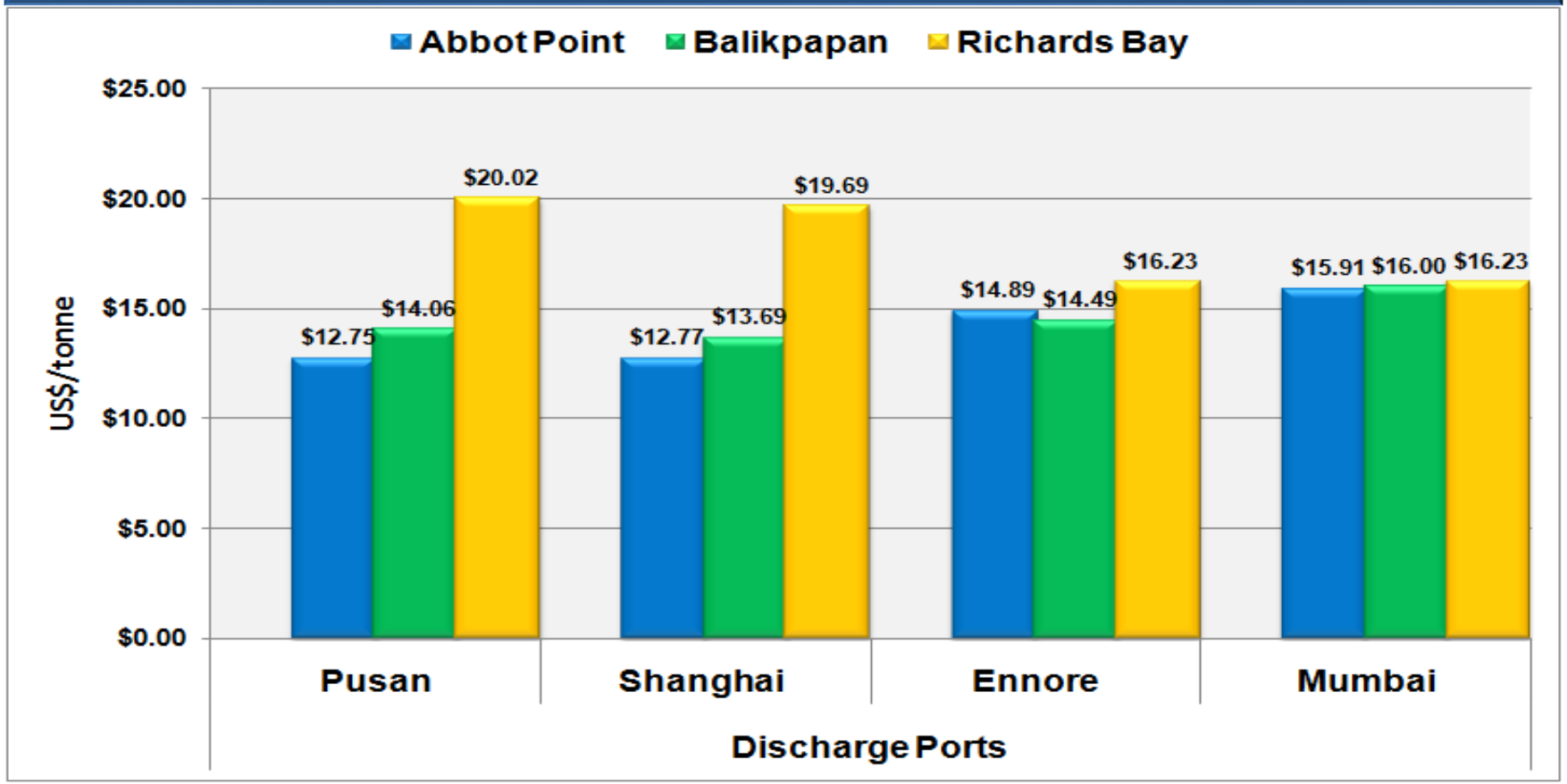
- Resource base
  - Measured: 5.8 billion tonnes
  - Indicated + Inferred: 10.3 billion tonnes
- Reserves: 5.4 billion tonnes
- LR Resource & Reserve estimates are the tip of the iceberg; Major producers are starting to shift production to LR coals
- But creating a market for LR coals will be a slow process – unless the TM of LR Coal can be reduced to levels of sub-bit coals

**Typical Specification**

- CV : *3900 – 4500 kcal/kg*
- S : 0.2% – 0.6%
- Ash : 3.0% – 7.0%
- TM : *35.0% – 40.0%*

**Indonesia will lose its transport cost advantage by 2015 due to the shift to low rank coal supply.**

**New freight rates = Raw tonnage freight rates from Slide 9 multiplied by energy adjustment factors (EAF) that express rates as coal having a CV of 6300 kcal/kg: EAF for Indonesia coal = 1.575 (6300/4000; EAF for other coals = 1.05 (6300/6000)**



Are Competing Sources of New Supply from Australia a threat to Indonesia's steam coal exports?

What if Australia gets its act together?

# Australia's coal exports are currently constrained by chronic infrastructure shortages as well as a certain amount of regulatory uncertainty

- Continued uncertainty about the schedule for expanding ports and rail networks.

- Carbon Pollution Reduction Scheme – on hold but not dropped completely – worst of both worlds.

- Super Profits Resource Tax of 40%, which may delay development of new mining projects and reduce foreign investment in mining sector.

# Mega-Mines under development in Queensland

| Developer | Basin | Deposit | 2010 Resource Estimate Ω (billion tonnes) | First Shipments (Year) | Export Capacity (MTPA) | Distance To Port (KM) | Total Capital ( billion AUS$) |
|---|---|---|---|---|---|---|---|
| Hancock Coal | Gallilee | Alpha Coal | 3.6 | 2013 | 30 | 495 | 7.5 |
| Hancock Coal | Gallilee | Kevins Corner | 3.4 | 2013 | 30 | 495 | 9.0 |
| Clive Palmer | Gallilee | Waratah | 4.3 | 2013 | 40 | 495 | 5.3 |
| Xstrata | Surat | Wandoan | 2.7 | Late 2014 | 22 | 380 | |
| Syntech | Surat | Cameby Downs | | | | | |

Ω Hancock Coal and Wandoan resource estimates include Measured, Indicated and Inferred Resources; Waratah Coal resources are Inferred only; Xstrata also estimates that it has 400 mt of Marketable Reserves (Proved and Probable)

# Australia's New Coal Supplies and Infrastructure Expansion Plans

## New Coals Sources by 2015

Gallilee

- Hancock Coal: 60 mtpa
- Clive Palmer: 40 mtpa
- South Galillee: 20 mtpa

Surat Basin

- Wandoan : 22 mtpa
- Cameby Downs: 15 mtpa

Other New Mines (by 2020):

Qnslnd/NSW: 50 mtpa

## Infrastructure Expansion Plans

Rail Hauling Capacity

- From 333 mtpa in 2008 to over 600 mtpa in 2020

Usable Port Handling Capacity

- Total: from 320 mtpa in 2008 to 540 mtpa in 2020
- Steam coal: from 164 mtpa in 2008 to 253 mtpa in 2020

# Coal Terminal Expansion Plans: NSW & Queensland, 2006 – 2020 (in mtpa)

| Newcastle | NSW | 2006 | 2008 | 2010 | 2012 | 2015 | 2020 |
|---|---|---|---|---|---|---|---|
| 1. Kooragang Coal Terminal | | 64.0 | 77.0 | 91.0 | 101.0 | 101.0 | 101.0 |
| 2. Carrington Coal Terminal | | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| 3. NCIG Coal Terminal (Planned) | | 0.0 | 0.0 | 30.0 | 45.0 | 66.0 | 66.0 |
| **Sub Total** | | **89.0** | **102.0** | **146.0** | **171.0** | **192.0** | **192.0** |
| **Port Kembla** | NSW | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 |
| **NSW Total** | | **105.0** | **118.0** | **162.0** | **187.0** | **208.0** | **208.0** |
| **Gladstone** | Queensland | | | | | | |
| 1. RG Tanna Coal Terminal | | 51.0 | 72.0 | 72.0 | 72.0 | 72.0 | 72.0 |
| 2. Barney Point Coal Terminal | | 7.0 | 7.0 | 7.0 | 7.0 | 0.0 | 0.0 |
| 3. Wiggins Island (Planned) | | 0.0 | 0.0 | 0.0 | 0.0 | 25.0 | 70.0 |
| **Sub Total** | | **58.0** | **79.0** | **79.0** | **79.0** | **97.0** | **142.0** |
| **Hay Point** | Queensland | | | | | | |
| 1. Dalrymple Bay Coal Terminal | | 55.7 | 85.0 | 85.0 | 85.0 | 85.0 | 85.0 |
| 2. Hay Point Coal Terminal | | 40.0 | 44.0 | 44.0 | 55.0 | 55.0 | 55.0 |
| **Sub Total** | | **95.7** | **129.0** | **129.0** | **140.0** | **140.0** | **140.0** |
| **Abbott Point** | Queensland | 15.0 | 25.0 | 50.0 | 80.0 | 100.0 | 100.0 |
| **Brisbane** | Queensland | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 10.0 |
| **Queensland Total** | | **173.7** | **238.0** | **263.0** | **304.0** | **345.0** | **392.0** |
| **TOTAL** | | **278.7** | **356.0** | **425.0** | **491.0** | **553.0** | **600.0** |

# Regulatory Uncertainty Related to the new Mining Law: Could it "kill the goose that lays the golden egg"?

# Indonesian Political Risk

- Perennial concern for thermal coal buyers and Indonesia's coal producers.
- Between 1998 and 2003, Central and Provincial Government actions were destroying the investment climate in the coal industry.
- Situation was so bad that US embassy and industry analysts were predicting the demise of Indonesia's coal industry.
- Then, in 2004, the GOI started acting more reasonably.
- In 2008, pendulum swung in the direction of greater political risk but is now "balanced" precariously.

## Specific Political Events

- Illegal Mining (1998 – 2005)
- Law on Regional Autonomy (22/99)
- Revision of VAT regulations

  (GR 144/2000 & 65/2001
- Forestry law 41/1999
- 5% Coal Export Tax (2005)
- Strikes/ Industrial Actions (on-going)
- Local government attempts to:
  - impose onerous new taxes
  - set unattractive fiscal terms for new coal concessions
  - nullify agreements and shut down mining operations

* Indonesia is now operating under a new mining law that will result in major changes to the industry's structure.
* The main change is the shift from Coal Contracts of Work to a system of Mining Licenses and the reduction in the license area to 15,000 ha.

| 2008 Contract Arrangements | Main changes under Mining Act of 2009 |
|---|---|
| • Coal Contracts of Work (CCOWs)<br>– 1st Gen (1981-90)<br>– 2nd Gen (1994- 1998)<br>– 3rd Gen (2000 – 2008)<br>– Features of 1st Gen CCOWs:<br>• large concession areas (25K – 100K ha)<br>• fixed fiscal terms<br>• little government interference<br>– 110 3rd Gen CCOWs signed; only 50 were still valid in 2008<br>• KPs<br>– Contracts let by Local Government for small areas | • Replacement of CCOWs and KPs with system of mining licenses known as IUPs.<br>• CCOWs remain valid until end of contract term; KPs converted to IUPs this year.<br>• Maximum license area: 15,000 ha<br>• Greater regulation of all aspects of mining, including selection of mining contractors.<br>• MEMR regulation of domestic market obligation (DMO) and mandatory coal reference price (CRP) |

# IF DMO and CRP regulations are not handled sensibly, they may damage Indonesia's reputation" as a reliable coal exporter.

| Domestic Market Obligation Regulation (January 2010) | Coal Reference Price Regulation (Pending) |
|---|---|
| – Requires Coal Suppliers to meet needs of local consumers before meeting exports.<br>– Domestic requirements determined each year by Ministry of Energy and Mineral Resources (MEMR)<br>– If any coal producer does not meet its domestic obligation, its production for the next year may be cut by 50%.<br>– Domestic coal buyers are obligated to buy coal they order but penalties for not buying are not as onerous as for producers. | – MEMR will also set a Reference Price for specific coals based on GOI-created price index and quality adjustment formulas<br>– Coal suppliers opposed early drafts of this regulation because penalties were excessive.<br>– Current draft decree is less punitive; Seller simply pays royalty in accordance with reference price.<br>– No more threats to cancel the coal producers license.<br>***Question still remains: why have this regulation at all?*** |

# Summary

- Kalimantan's coal industry has shown incredible growth in output and market power over the past 20 years but the best quality reserves are rapidly being depleted.
- Infrastructure constraints will not be a problem for the foreseeable future.
- Coal resource and reserve estimates are more than adequate to meet any reasonable forecast of domestic and export requirements for the next two decades and beyond.
- The switch to low rank coals and regulatory and political risks are, at this point in time, the biggest challenges facing Indonesia's coal industry.
- Moving to low rank coals will require Indonesia's coal producers to develop new markets and perhaps to invest in risky and unproven coal drying technologies.
- With respect to regulatory risk, the Indonesian Government (GOI), over the past decade, has implemented a number of laws and regulations that were well-intentioned, but either badly structured or incompetently administered.

# Summary

- The new mining law is another instance of the GOI “muddling through” the process of issuing administratively efficient and fair implementing rules for a well-intentioned law.
- One hopes that the MEMR will recognize the investment uncertainty it is creating by its process and take the proactive steps to issue regulations that support the continued growth of the coal industry.
- In the meantime, the MEMR needs to be careful that it does not give to new coal producers in Queensland an opportunity to take away existing and new export markets.

# Annex

Kalimantan uses trucks, barges and OLCs to get coal to land-based load ports and to a growing number of floating facilities (FFs), which can be expanded quickly at a low first cost. But FFs have lower loading rates than fixed land ports, which means higher shipping costs.

| | Queensland | NSW | Kalimantan (barge) | Sumatra |
|---|---|---|---|---|
| Rail/Barge | 233 mtpa | >100 mtpa | 200 mtpa (Barito)<br>>100 mtpa (Mahakham) | n/a |
| Fixed Land Ports | 238 mtpa | 118 mtpa | 70 – 80 mtpa | 10 -20 mtpa |
| Offshore Facilities | n/a | n/a | 175 mtpa (80% of nameplate capacity) | n/a |
| Anchorages | n/a | n/a | Geared vessels (10 -20 mtpa extra?) | 5-7 |

# Inland transport arrangements for Indonesia's 6 largest coal producers favor truck & barge with some overland conveyors

| Company | 2008 Production (million tonnes) | 2008 Exports (million tonnes) | Mine Site to Barge Port in km | Barge Port to Vessel or T/S Facility (km) | Remarks |
|---|---|---|---|---|---|
| KPC | 36.3 | 32.1 | 13 (OLC) | 1/9 (OLC) | Load Port: TBCT |
| Adaro | 38.5 | 30.2 | 79 (truck) | 250/450 (Barge) | Loading @Taboneo anchorage or IBT |
| Kideco | 21.9 | 16.1 | 39 (truck) | 58 (Barge) | 8-12 KT Barges loads @ TMCT and then 28 KM to Floating Cranes |
| Arutmin | 15.7 | 14.3 | 7 -18 (truck) | 124/199 (Barge) | Barges @ Sauti & Mulia travel 160 KM to NPLCT; can load PMX and Cape vessels |
| Berau | 12.9 | 8.2 | 13 (truck) | 74 (Barge) | From Lati to Muara Pantai |
| Indominco | 10.8 | 10.3 | 35 (truck) | 0/9 (OLC) | From Port to Bontang Coal Terminal |

# Indonesia's coals have lower CV, higher moisture and lower AFT but, in many cases, ultra low sulfur and ash when compared with……

| Coal Quality Parameter | Coal Brand → | KPC Pinang | KPC Melawan | Adaro Envirocoal | Arutmin Ecocoal | Kideco Roto |
|---|---|---|---|---|---|---|
| | Reporting Basis ↓ | | | | | |
| GCV (Kcal/kg) | GAD | 6,546 | 5,735 | 5,900 | 5,000 | 5,310 |
| GCV (Kcal/kg) | GAR | 6,150 | 5,350 | 5,100 | 4,221 | 4,700 |
| Moisture (%) | AR | 14.5 | 23.5 | 26.0 | 35.0 | 26.5 |
| Moisture (%) | AD | 9.0 | 18.0 | 14.5 | 23.0 | 17.0 |
| Ash (%) | AD | 5.5 | 3.0 | 1.5 | 3.9 | 3.0 |
| VM (%) | AD | 40.0 | 38.0 | 43.0 | 38.0 | 41.5 |
| TS (%) | AD | 0.70 | 0.25 | 0.20 | 0.20 | 0.24 |
| AFT (C°) | Initial Deform. Red. Atmos. | 1150 | 1150 | 1200 | 1150 | 1150 |
| HGI (#) | n/a | 45 | 42 | 50 | 60 | 45 |

# …. NSW export-grade steam coals

| Coal Quality Parameter ↓ | Coal Field → | Southern | Western | Hunter | Newcastle | Gunnedah |
|---|---|---|---|---|---|---|
| | Reporting Basis ↓ | | | | | |
| GCV (Kcal/kg) | GAD | 6,750 | 6,600 | 6,810 | 6,760 | 7,050 |
| GCV (Kcal/kg) | GAR | 6,390 | 6,220 | 6,360 | 6,330 | 6,515 |
| Total Moisture (%) | AR | 6.4 | 8.0 | 9.1 | 8.5 | 9.0 |
| Inherent Moist. (%) | AD | 1.1 | 2.6 | 2.7 | 2.3 | 1.5 |
| Ash (%) | AD | 19.5 | 20.4 | 13.5 | 15.1 | 17.5 |
| VM (%) | AD | 20.8 | 28.7 | 32.7 | 30.6 | 26.8 |
| TS (%) | AD | 0.45 | 0.55 | 0.60 | 0.60 | 0.65 |
| AFT (C°) | Int. Deform. Red. Atmos. | 1460 | 1460 | 1270 | 1380 | 1530 |
| HGI (#) | n/a | 64 | 45 | 50 | 52 | 65 |

Source: www.australianminesatlas.com

# Differences in CV and moisture levels will become even more pronounced once Indonesia's low rank coal are brought into the market

| | | Indonesian Low Rank Coals | | | Australian New Coals | |
|---|---|---|---|---|---|---|
| Coal Quality Parameter ↓ | Coal Brand → | Adaro Wara | Kideco SM | Arutmin Ecocoal | Hancock (Gallilee Basin) | Xstrata (Wandoan) |
| | Reporting Basis ↓ | | | | | |
| GCV (Kcal/kg) | GAD | 4,865 | 5,255 | 5,000 | 6,500 | 6,350 |
| GCV (Kcal/kg) | GAR | 4,000 | 4,100 | 4,221 | 6,040 | 5,975 |
| Moisture (%) | AR | 40.0 | 36.0 | 35.0 | 15.0 | 15.0 |
| Moisture. (%) | AD | 27.0 | 18.0 | 23.0 | 8.5 | 9.7 |
| Ash (%) | AD | 2.5 | 4.0 | 3.9 | 7.7 | 8.0 |
| VM (%) | AD | 37.0 | 43.0 | 38.0 | 34.4 | 41.5 |
| TS (%) | AD | 0.15 | 0.10 | 0.20 | 0.45 | 0.4 |
| AFT (C°) | Initial Deform. Red. Atmos. | 1300 | 1120 | 1150 | 1350 | 1340 |
| HGI (#) | n/a | 50 | 45 | 60 | 50 - 55 | 35 |

**In 2003, lignites comprised a very small share of Indonesia's coal resource base, due to the lack of exploration activity directed at low rank coals + perhaps because the figures may have been reported on a AD basis**

| 2003 Coal Resource Estimates (million tonnes) (unclear whether tonnes are on "ar" or "ad" basis) | | | | | | | % of total |
|---|---|---|---|---|---|---|---|
| Coal Rank | Calorific value (Kcal/kg, gar) | Hypothetical | Inferred | Indicated | Measured | Total | |
| Lignite | <4500 | 0 | 1,512 | 9,581 | 4,021 | 15,114 | 26% |
| Sub-bituminous | 4500 – 5800 | 476 | 17,463 | 10,255 | 4,997 | 33,191 | 57% |
| Bituminous | >5800 | 57 | 5,341 | 697 | 3,448 | 9,543 | 17% |
| Total | n/a | 533 | 24,316 | 20,533 | 12,466 | 57,848 | 100% |

Source: Indonesian Coal Book, 2006/2007, ICMA, August 2006

In 2005, lignites comprised a very small share of Indonesia's coal resource base, due to the lack of exploration activity directed at low rank coals + perhaps because the figures may have been reported on a AD basis

| 2005 Coal Resource Estimates (million tonnes) (unclear whether tonnes are "ar" or "ad") | | | | | | | % of total |
|---|---|---|---|---|---|---|---|
| Coal Rank | Calorific value (Kcal/kg, gar) | Hypothetical | Inferred | Indicated | Measured | Total | |
| Lignite | <4500 | 1,685 | 8,711 | 2,382 | 2,317 | 15,095 | 25% |
| Sub-bituminous | 4500 – 5800 | 1,924 | 19,653 | 9,176 | 4,939 | 35,692 | 59% |
| Bituminous | >5800 | 71 | 5,462 | 681 | 3,513 | 9,727 | 16% |
| Total | n/a | 3,680 | 33,826 | 12,239 | 10,769 | 60,514 | 100% |

Source: Indonesian Coal Book, 2006/2007, ICMA, August 2006

- 2007 Resource estimates reflect findings of a Joint NEDO/Badan Geologi study
- 54% increase over 2005 due to increase in hypothetical and measured resources.
- LRC = small share of Indonesia's coal resources due to lack of LRC exploration, also figures may have been reported on an "air-dried" basis

| Resources (million tonnes) (unclear whether tonnes are "ar" or "ad") | | | | | | | % of total |
|---|---|---|---|---|---|---|---|
| Coal Rank | Calorific value (Kcal/kg, gar) | Hypothetical | Inferred | Indicated | Measured | Total | |
| Lignite | <4500 | 5,058 | 6,579 | 3,652 | 5,750 | 21,039 | 23% |
| Sub-bituminous | 4500 – 5800 | 16,925 | 22,104 | 9,042 | 10,867 | 58,938 | 63% |
| Bituminous | >5800 | 1,650 | 6,515 | 968 | 4,293 | 13,426 | 14% |
| Total | n/a | 23,633 | 35,198 | 13,662 | 20,910 | 93,403 | 100% |

Source: Indonesian Coal Book, 2008/2009, ICMA, July 2008

# 2009 resource estimates are 12% higher than 2007 estimate with increase due to more sub-bits.

| Resources by Category (million tonnes) (unclear whether tonnes are "ar" or "ad") | | | | | | | % of total |
|---|---|---|---|---|---|---|---|
| Coal Rank | Calorific value (Kcal/kg, gar) | Hypothetical | Inferred | Indicated | Measured | Total | |
| Lignite | <4500 | 5,058 | 6,588 | 3,721 | 5,816 | 21,183 | 20% |
| Sub-bituminous | 4500 – 5800 | 27,764 | 18,888 | 10,942 | 11,956 | 69,551 | 66% |
| Bituminous | >5800 | 1,798 | 6,670 | 1,075 | 4,479 | 14,023 | 14% |
| Total | n/a | 34,620 | 32,147 | 13,662 | 22,252 | 104,757 | 100 % |

Source: ESDM, May 2010

# Sumatra and Kalimantan accounted for 99% of Indonesia's Resources Base in 2005 with Kalimantan accounting for 54% of resources base.

Resources by Category
(Million Tonnes)
(unclear whether tonnes are "ar" or "ad")

| Province | Hypothetical | Inferred | Indicated | Measured | Total | % of Total |
|---|---|---|---|---|---|---|
| Sumatra | 1,862 | 12,932 | 11,675 | 928 | 27,397 | 45% |
| Kalimantan | 1,818 | 20,706 | 564 | 9,820 | 32,908 | 54% |
| Other | 0 | 188 | 1 | 21 | 210 | 1% |
| Total | 3,680 | 33,826 | 12,240 | 10,769 | 60,515 | 100.0% |

Source: Indonesian Coal Book, 2006/2007, ICMA, August 2006

# Sumatra and Kalimantan continued to account for 99% of Indonesia's Resources Base in 2007 but Sumatra holds larger share of resources

Resources by Category
(Million Tonnes)
(unclear whether tonnes are "ar" or "ad")

| Province | Hypothetical | Inferred | Indicated | Measured | Total | % of Total |
|---|---|---|---|---|---|---|
| Sumatra | 20,148 | 13,949 | 10,735 | 7,699 | 52,532 | 56% |
| Kalimantan | 3,389 | 21,029 | 2,894 | 13,156 | 40,468 | 43% |
| Other | 96 | 220 | 33 | 55 | 403 | 1% |
| Total | 23,633 | 35,198 | 13,662 | 20,910 | 93,403 | 100.0% |

Source: Indonesian Coal Book, 2008/2009, ICMA, July 2008

- Reserve Estimates in 2005 did not include Probable Reserves
- LRCs represented a surprisingly large share of Proven Reserves

| | | | Reserves (million tonnes) ("ar" or "ad"?) | | | |
|---|---|---|---|---|---|---|
| Coal Rank | Calorific value (kcal/kg) GAD | GAR | Probable | Proven | Total | % of total |
| Lignite | <5100 | <4500 | n/a | 3,452 | 3,452 | 49% |
| Sub-bituminous | 5100– 6100 | 4500 -5800 | n/a | 1,828 | 1,828 | 26% |
| Bituminous | >6100 | >5800 | n/a | 1,727 | 1,727 | 25% |
| **Total** | **n/a** | **n/a** | **n/a** | **7,007** | **7,007** | **100%** |

Source: Indonesian Coal Book, 2006/2007, ICMA, August 2006, except for CV (gar) estimates, which are from Roleva Energy.

- **Reserve estimates in 2007 were 260% higher than the 2005 estimate due to inclusion of "Probable Reserves"**

*** Lignites share of total reserves now much smaller than in 2005.**

| | | | Reserves (million tonnes) ("ar or ad"?) | | | |
|---|---|---|---|---|---|---|
| Coal Rank | Calorific value (kcal/kg) GAD | GAR | Probable | Proven | Total | % of total |
| Lignite | <5100 | <4500 | 4,292 | 1,105 | 5,397 | 29% |
| Sub-bituminous | 5100– 6100 | 4500 -5800 | 8214 | 2,971 | 11,185 | 60% |
| Bituminous | >6100 | <5800 | 744 | 1,385 | 2,129 | 11% |
| **Total** | **n/a** | **n/a** | **13,250** | **5,461** | **18,711** | **100%** |

Source: Indonesian Coal Book, 2008/2009, ICMA, July 2008, except estimates of CV (gar), which are from Roleva Energy

# Australia's Steam Coal Resources and Reserves

- The Australian Government's official estimates of coal resources and reserves are published annually by Geoscience Australia.
- The latest Geoscience Australia report, titled "AUSTRALIA'S IDENTIFIED MINERAL RESOURCES 2009" was published in December 2009.
- It provides resource and reserve estimates for all mineral resources, including black and brown coal and CBM.
- Resource estimates are first expressed as Demonstrated Resources and then separated into Economic and Sub-economic Demonstrated Resources.
- The Economic Demonstrated Resources (EDR)represent those resources which Geoscience Australia conclude have either near-term or long-term potential to be developed economically.
- EDR are substantially greater than the JORC Reserves reported annually by publicly traded mining companies– roughly 3-4 times greater.

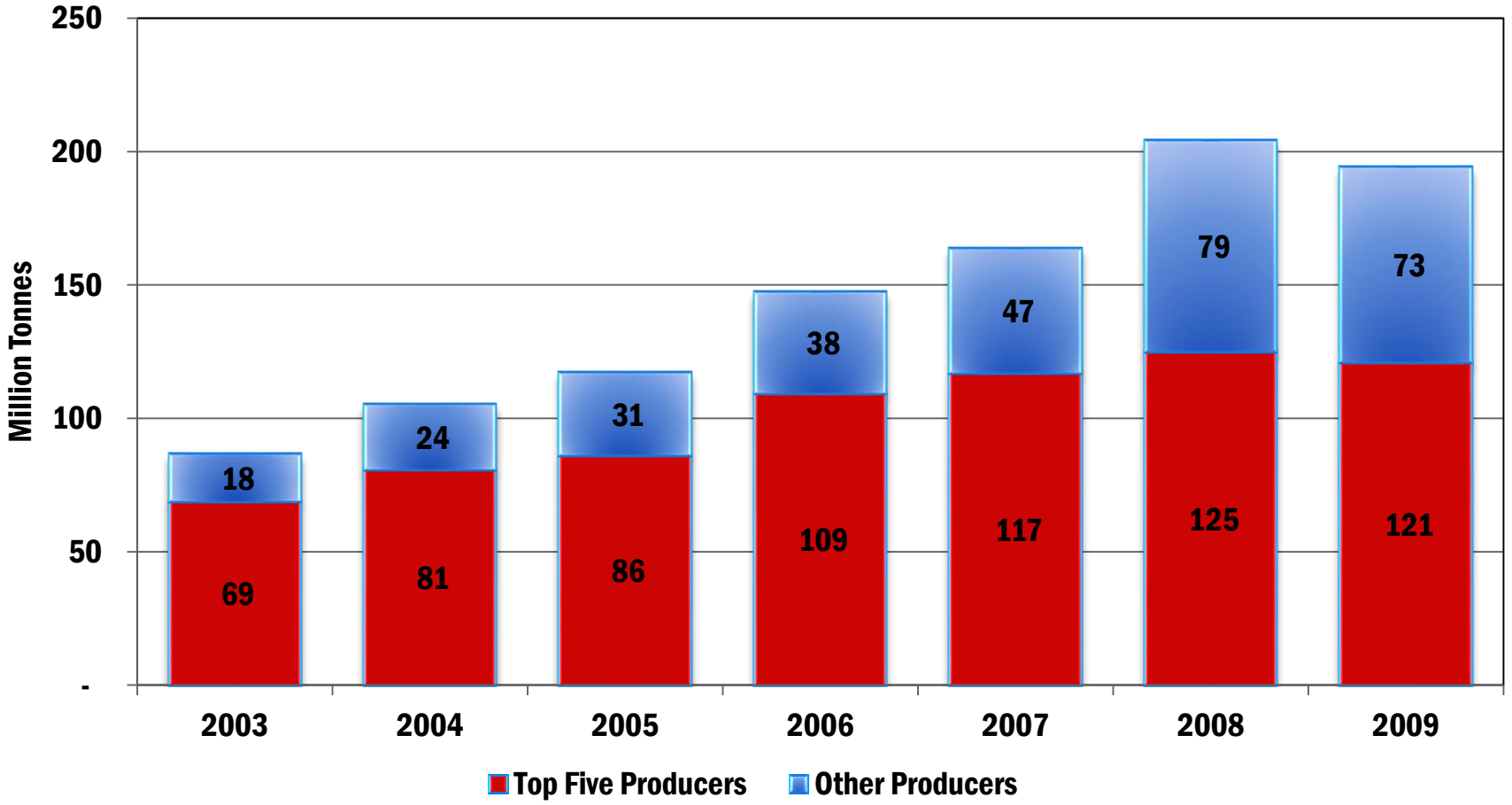
# Geoscience Australia has published black coal EDR data as of December 2008 (billion tonnes)

| | Demonstrated Resources | | | | Company + Geoscience Estimates | |
|---|---|---|---|---|---|---|
| | Economic (EDR) | Accessible EDR (AEDR) | Sub-economic | | Inferred Resources | JORC Reserves (% of AEDR) |
| | | | Para-marginal | Sub-marginal | | |
| Black Coal | | | | | | |
| • in situ | 56.2 | n/a | 3.0 | 10.3 | 106.0 | n/a |
| • recoverable | 39.2 | 39.1 | 1.5 | 6.7 | 66.7 | 13.4 (34%) |
| Brown Coal | | | | | | |
| • in situ | 44.3 | n/a | 43.1 | 18.1 | 112.3 | n/a |
| • recoverable | 39.2 | 32.2 | 38.8 | 16.3 | 101.1 | 4.8 (15%) |

Source: Geoscience Australia, "Australia's Identified Mineral Resources, 2009, Table 1

Indonesia's coal industry is highly concentrated but the level of concentration is declining:

- In 2003, five 1st Gen CCOW holders - KPC, Adaro, Kideco, Arutmin & Indominco- accounted for over 79% of Indonesia's coal exports .
- In 2008, these same five producers accounted for 62% of total exports.




Source: Energy Publishing

# But then so is Australia's black coal industry

- Hard Coking Coal
  - 92% of hard coking coal reserves are located in the Bowen Basin
  - 60% of those reserves are controlled by BHPB
  - 25% by Xstrata, Rio Tinto, Anglo and Peabody
- Soft Coking Coal
  - All JORC Reserves of soft coking coal are located in NSW
  - 45% managed by Xstrata
  - 25% by Rio Tinto
- Thermal is much less concentrated but Xstrata owns Rolleston ( 8 mtpa), Anglo-American owns Callide (9 mtpa) and Rio Tinto owns Blair Athol/Clermont (12 mtpa)

# Queensland's 10 largest coal mines accounted for 44% of 2009 saleable production

| Mine | Operator | 2009 Sales | Type of Coal |
|---|---|---|---|
| Callide & Boundary Hill | Anglo | 8,766,657 | Steam |
| Blair Athol | Rio Tinto | 11,386,867 | Steam |
| Peak Downs | BMA | 8,753,660 | Coking |
| Curragh | Wesfarmers | 9,010,348 | Coking/Steam |
| Rolleston | Xstrata | 6,117,575 | Thermal |
| Newlands | Xstrata | 6,502,158 | Coking/Steam |
| Ensham | Idemitsu Kosan | 7,664,282 | Steam |
| Goonyella - Riverside | BMA | 9,374,948 | Coking |
| Blackwater | BMA | 11,178,271 | Coking/Steam |
| Dawson | Anglo | 6,742,429 | Coking/Steam |
| | Subtotal | 85,497,195 | 44% |
| | Saleable Production | 195,431,915 | |