

Present and Projected Australian Coal Supply Capacity[◆]

– Impacts of Global Recession and Expansion in Coal Exports to China –

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Summary

Australia's coal exports in 2008 totaled 252 million tons, accounting for 26.9% of global coal trade (in terms of exports) at 938 million tons. Although Indonesia has expanded its coal exports over recent years and reported exports in 2008 at 203 million tons, Australia has remained unshaken as the world's largest coal exporter¹.

Coal demand in Japan and European industrial countries has plunged on the global financial/economic crisis since the autumn of 2008. Their coal imports have thus declined. But China has expanded coal demand on the strength of high economic growth and increased coal imports more rapidly than earlier due to high domestic coal prices.

Australia's coal exports have maintained an upward trend even amid the global recession. In response to growing coal demand, new coalfield development and other projects are planned to expand production in Australia.

This report considers the past results and future projections of Australia's coal production and exports and its future coal supply capacity including estimated output under new coalmine development projects. It also covers the realities of a sharp increase in Australia's coal exports to China in 2009.

1. Present Coal Production and Exports

1-1 Coal Production²

Australia's coal production, excluding brown coal, was estimated to increase 4.5-fold from 71.6 million tons (including 31.5 million tons in steaming coal and 40.1 million tons in coking coal) in 1980 to 325.4 million tons (including 185.3 million tons in steaming coal and 140.1 million tons in coking coal) in 2008. The average annual increase came to 5.6% between 1980 and 2008. The average slowed from 8.3% between 1980 and 1990 to 4.2% between 1990 and 2000 and to 3.9% between 2000 and 2008 while output increased. Australia's coal output expansion has responded to an increase in coal export demand rather than domestic demand. Although Australia's

◆ We have produced this report by adding new information to and reorganizing a report on a FY 2009 survey on advanced overseas coal development (a survey on coal and infrastructure development in Australia's Queensland and New South Wales) that the IEEJ made under a contract with the New Energy and Industrial Technology Development Organization. We thank NEDO for its understanding and cooperation in publishing this report.

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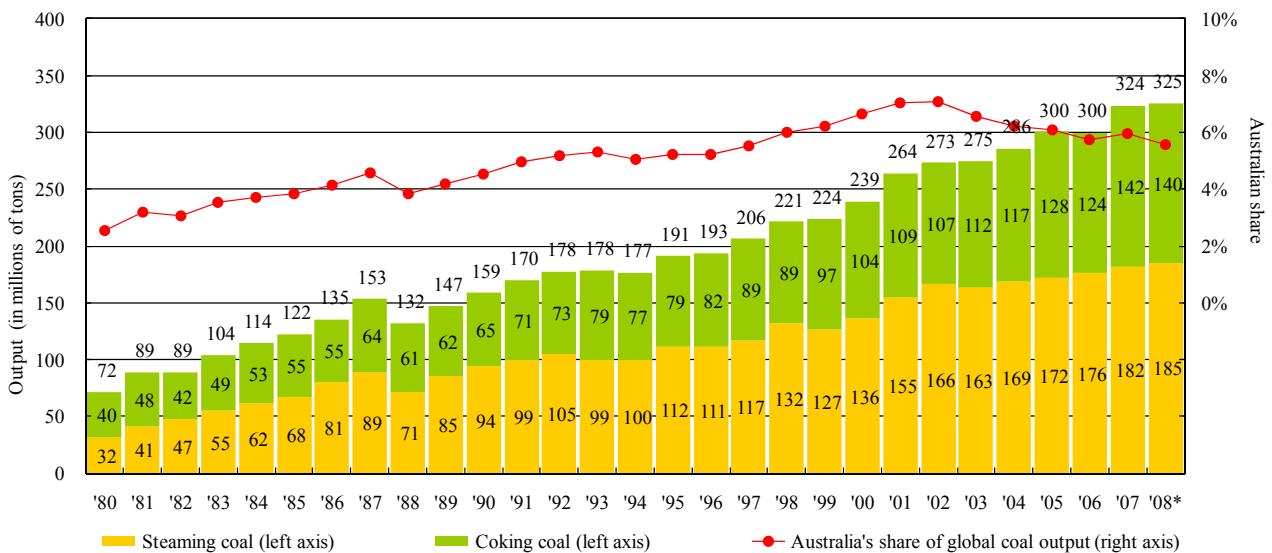
¹ Based on IEA Coal Information 2009.

² Data in this section are based IEA Coal Information 2009.

domestic consumption accounted for 48% of its coal output in 1980, the domestic consumption share slipped below 30% in 1991 and stood at 22.5% in 2008. Its annual domestic coal consumption steadily expanded before remaining flat around 73 million tons from 2005.

Australia’s coal production in 2008 stood at 325.4 million tons (5.6% of global output), indicating the country as the fourth largest coal producer in the world. The production volume is far less than the 2,761 million tons (47.2% of global output) for China as the largest producer and the 1,066 million tons (17.2% of global output) for the United States as the second largest producer in 2008. But the two largest coal producers domestically consume far more coal than Australia. As explained later, Australia supplies far more coal to the international market, standing as the world’s largest coal exporter. In 2008, Australia produced 185 million tons in steaming coal (3.7% of global output), the sixth largest volume in the world, and 140.1 million tons in coking coal (16.4% of global output), the second largest.

Fig. 1-1 Australia's Coal Output (excluding brown coal)



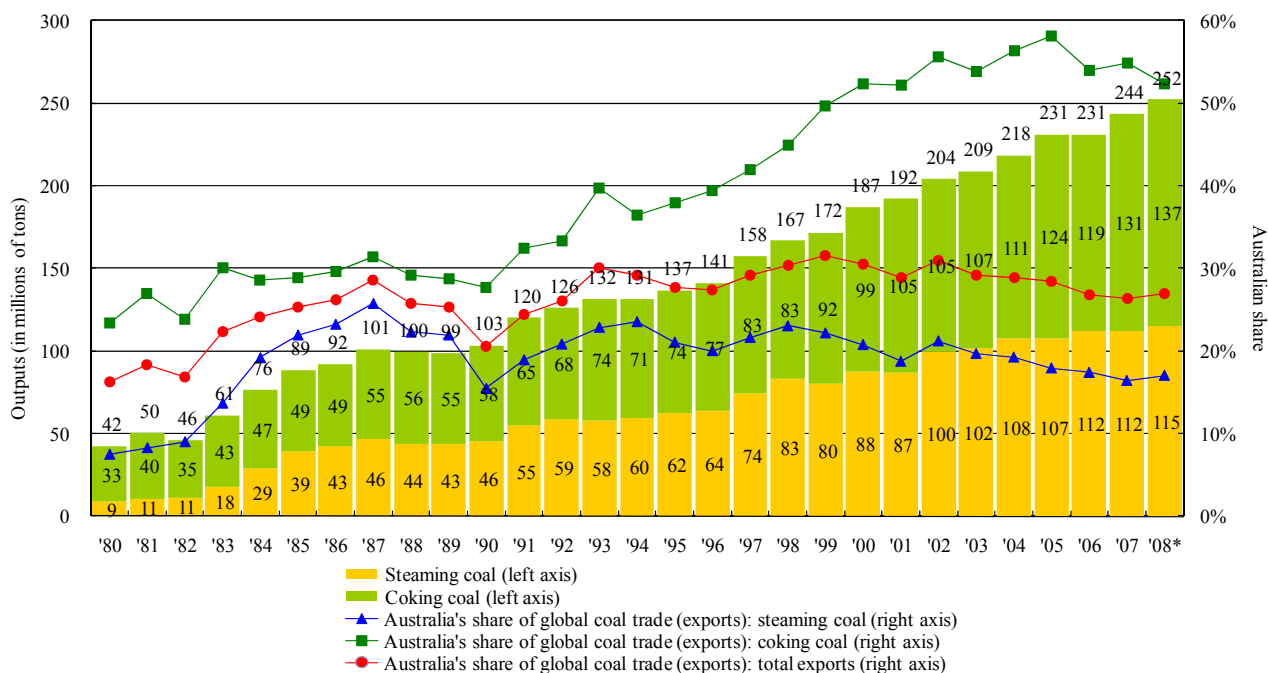
Note : Data for 2008 are estimates. Steaming coal includes anthracite.
 Source : Prepared from IEA Coal Information 2009

1-2 Coal Exports³

Global coal trade (in terms of exports) excluding brown coal has increased rapidly since the early 2000s. The trade exceeded 600 million tons in 2000 and was estimated to expand to 938 million tons for 2008. Supporting the expansion has been Australia. Its coal exports were estimated to increase 6.0-fold from 42.4 million tons (including 8.9 million tons in steaming coal and 33.5 million tons in coking coal) in 1980 to 252.2 million tons (including 115.3 million tons in steaming coal and 136.9 million tons in coking coal) in 2008.

³ Data given in this section are based on IEA Coal Information 2009.

Fig. 1-2 Australia's Coal Exports (excluding brown coal)

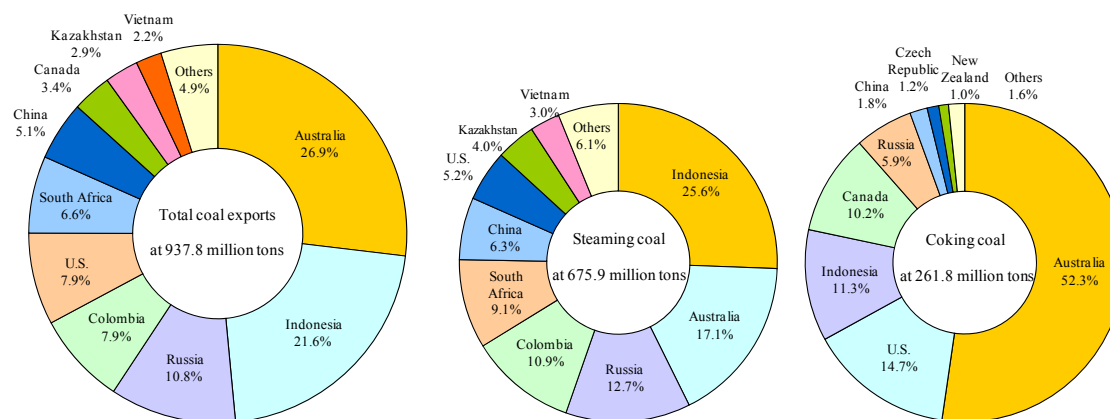


Note : Data for 2008 are estimates. Steaming coal includes anthracite.

Source : Prepared from IEA Coal Information 2009

Australia's coal exports in 2008 totaled 252.2 million tons (26.9% of global exports), indicating the country as the world's largest coal exporter. Exports by Indonesia, the second largest, also exceeded 200 million tons to 202.6 million tons (21.6% of global exports). Exports by Russia, the third largest, were less by more than 100 million tons. Australia's share of global coal exports remained around 30% from the 1990s to the early 2000s. But the share has slipped below 27% since 2006 as such countries as Indonesia, Russia and Colombia expanded coal exports.

Fig. 1-3 World's Top 10 Coal Exporters in 2008 (excluding brown coal)



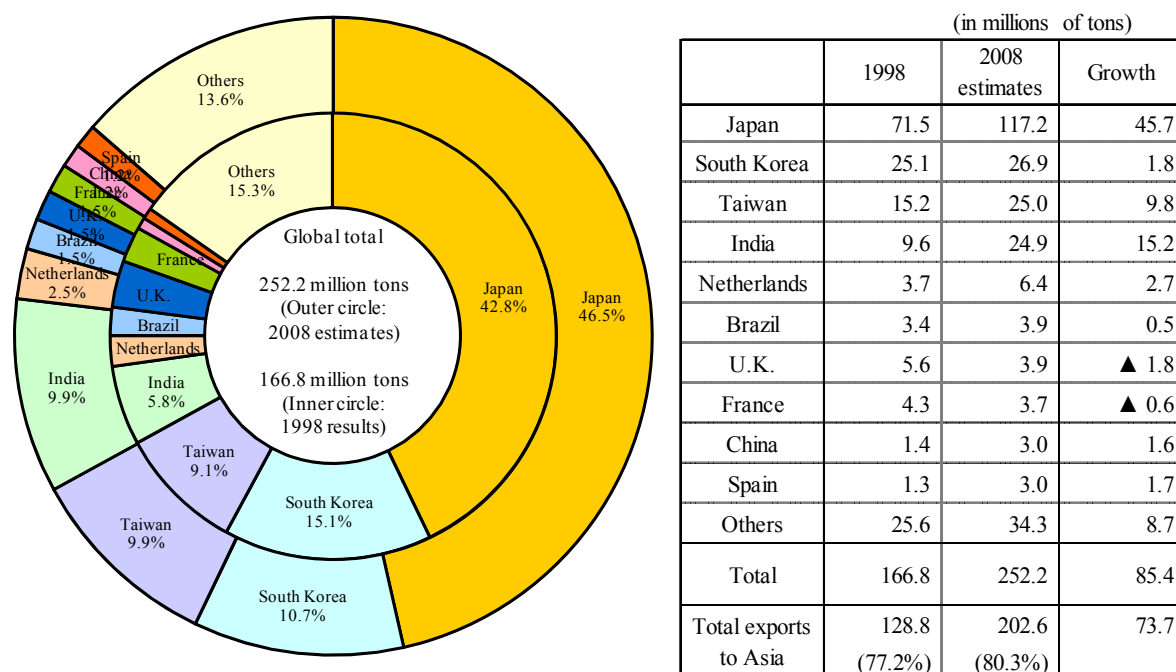
Note : Steaming coal includes anthracite.

Source : Prepared from IEA Coal Information 2009

Australia’s steaming coal exports in 2008 came to 115.3 million tons (17.1% of global steaming coal exports), second only after Indonesia’s 173.0 million tons (25.6% of global steaming coal exports). Indonesia replaced Australia as the world’s largest steaming coal exporter in 2005. The gap between them has expanded since then. Meanwhile, Australia exported 136.9 million tons in coking coal in 2008, accounting for a dominant 52.3% of global coking exports.

Australia’s coal export destinations totaled more than 30 countries and regions in 2008. Exports to Asia accounted for 202.6 million tons or more than 80% of total exports. As indicated in Fig. 1-4, Japan was Australia’s largest coal export destination, accounting for 117.2 million tons or 46.5% of the total. The second largest destination was South Korea with 26.9 million tons (10.7% of Australia’s total exports), followed by Taiwan with 25.0 million tons (9.9%) and India with 24.9 million tons (9.9%). The four largest destinations captured 76.9% of Australia’s total coal exports. Annual average export growth for India between 1998 and 2008 was the highest at 9.9%, followed by 8.5% for Spain and 8.1% for China. But exports to Spain and China are limited to low levels. Exports to Japan and Taiwan posted an average annual increase of 5.1%. But average annual growth in exports to South Korea has been limited to 0.7%. Growth in exports to non-Asia destinations differed from country to country. But the growth in volume during the 10 years was limited to 12.0 million tons, far less than 73.7 million tons in growth in exports to Asia. Australia’s coal export target is not Europe but Asia which is closer to Australia.

Fig. 1-4 Australia’s Top 10 Coal Export Destinations (excluding brown coal)



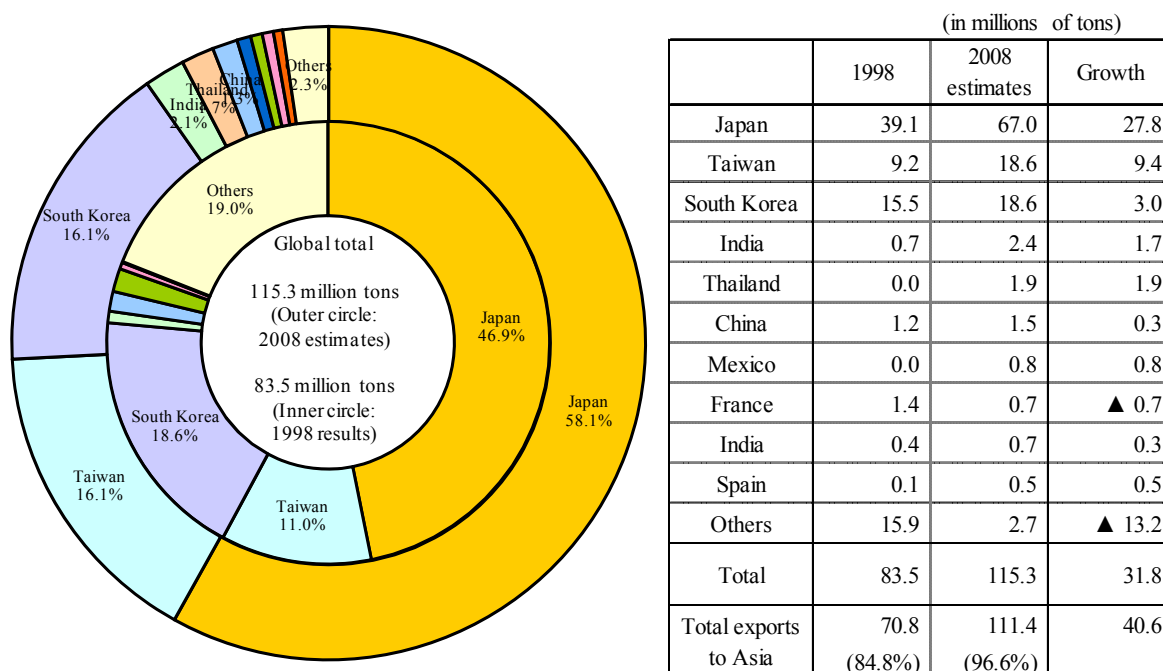
Source : Prepared from IEA Coal Information 2009

Among the Top 10 destinations for Australia’s steaming coal exports in 2008, Japan was by far the largest, as indicated in Fig. 1-5. Steaming coal exports to Japan totaled 67.0 million tons (58.1%

of Australia’s total steaming coal exports). The second and third largest destinations were Taiwan and South Korea. Exports to each of the two came to 18.6 million tons (16.1% of the total). The three destinations accounted for more than 90% of Australia’s steaming coal exports. (Steaming coal exports to Asia aggregated 111.4 million tons, capturing 96.6% of Australia’s total steaming coal exports.) Growth in exports to Japan during the past 10 years was remarkably sharp. Exports to Taiwan posted the second largest growth. Exports to Japan, Taiwan and South Korea in East Asia accounted for most of Australia’s steaming coal exports for the following apparent reasons:

- ①The three lack coal resources and must depend on imports from abroad.
- ②The three have expanded coal thermal power generation to meet an increase in electricity demand.

Fig. 1-5 Australia’s Top 10 Steaming Coal Export Destinations



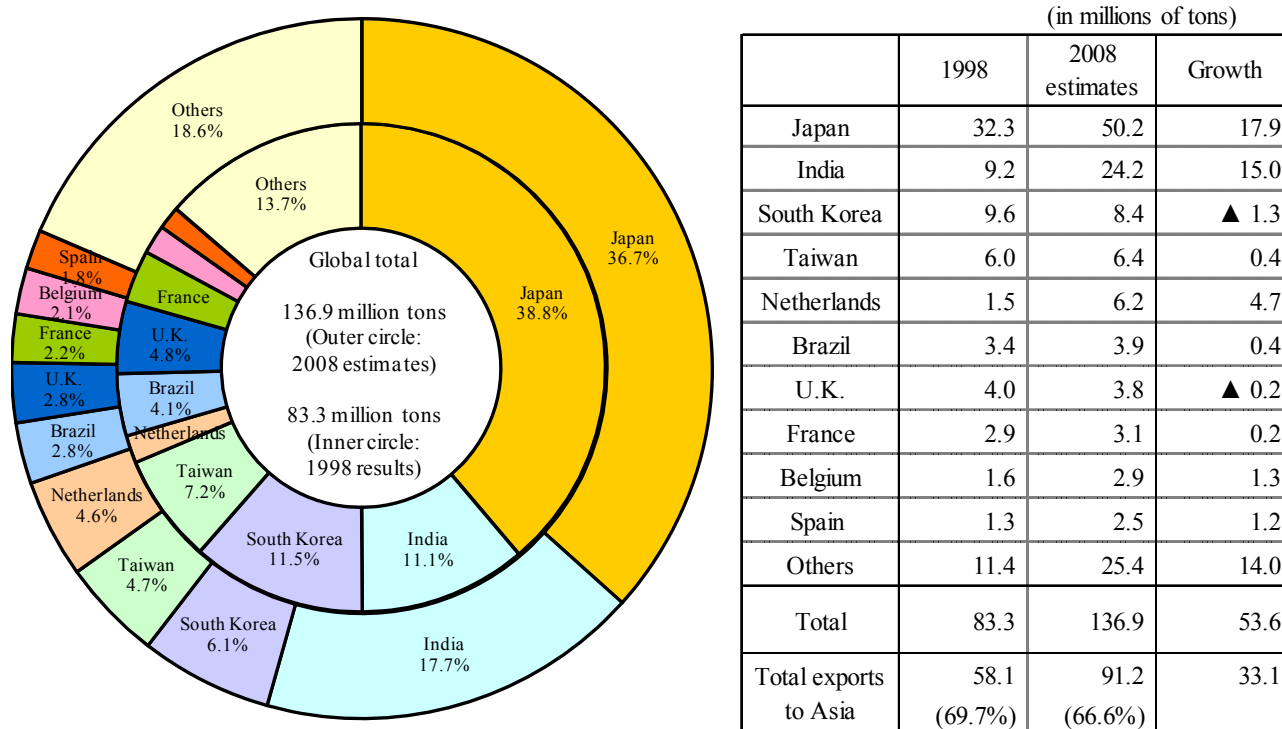
Note : Steaming coal includes anthracite.
 Source : Prepared from IEA Coal Information 2009

Among the Top 10 destinations for Australia’s coking coal exports in 2008, Japan was the largest, as was the same case with steaming coal exports, accounting for 5.02 million tons (36.7% of Australia’s total coking coal exports), as shown in Fig. 1-6. The second largest destination was India with 24.2 million tons (17.7% of the total), followed by South Korea with 8.4 million tons (6.1%) and Taiwan with 6.4 million tons (4.7%). The four largest destinations captured 65% of Australia’s coking coal exports. Australia’s coking coal exports to Asia totaled 91.2 million tons, accounting for 66.6% of its total coking coal exports. This share was some 30 percentage points less than 96.6% as Asia’s share of Australia’s steaming coal exports (energy resources-poor Japan, South Korea and Taiwan accounted for 90.3% of Australia’s total steaming coal exports). This is because steaming coal is

used primarily as a heat source (and can be replaced with other heat sources) while coking coal is used for limited purposes including coke production as indicated by its name. Regions with coking coal resources are so limited that countries having no such resources must depend on imports from abroad. In this way, destinations for coking coal exports are more diversified than for steaming coal exports. Nevertheless, export volumes differ from destination to destination.

From 1998 to 2008, Australia’s coking coal exports to Japan and India posted remarkably rapid growth. One factor behind the rapid growth is an expansion in steel output in the two countries. (Pig iron output increased from 75.0 million tons in 1998 to 86.2 million tons in 2008 in Japan and from 20.2 million tons to 28.9 million tons in India.) Although India is the world’s third largest coal producer with output estimated at 489.5 million tons for 2008, it is poor in coking coal resources (coking coal accounted for only 6% of its total coal output in 2008). Therefore, India expanded coking coal imports in line with the steel production growth.

Fig. 1-6 Australia’s Top 10 Coking Coal Export Destinations



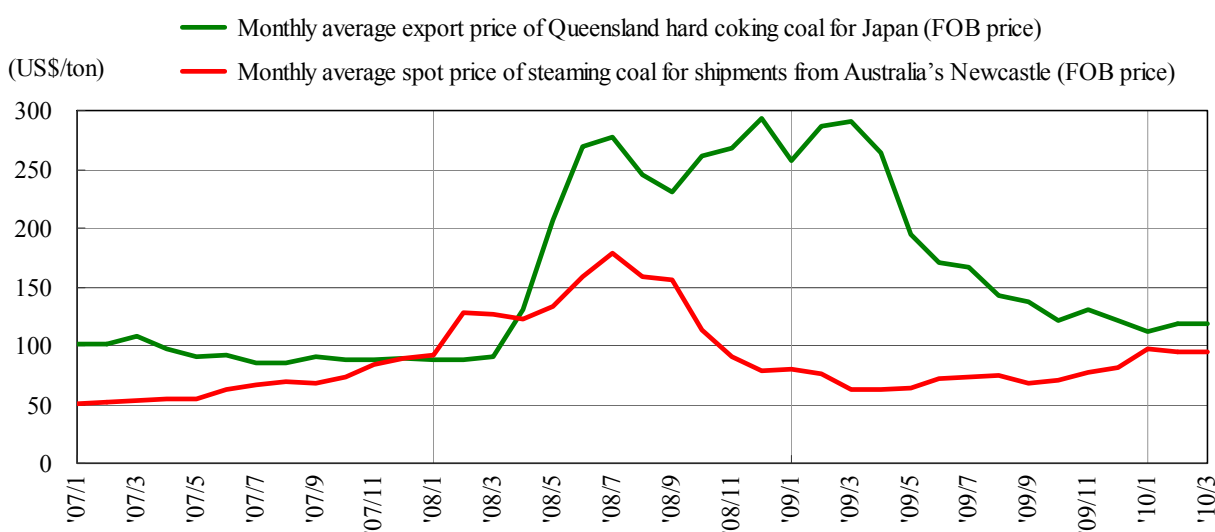
Source : Prepared from IEA Coal Information 2009

2. Global Recession’s Impacts on Australia’s Coal Supply

The global financial crisis, which originated from the U.S. subprime mortgage problem and was triggered by the failure (on September 15, 2008) of major U.S. investment bank Lehman Brothers Inc., exerted great impacts on the world economy. Since autumn of 2008, energy demand has slackened amid economic stagnation under the global financial crisis. Steaming and coking

coal demand plunged, easing the coal supply/demand relationship. Particularly, coking coal demand posted a sharp decline, leading coal prices to drop substantially. As indicated in Fig. 2-1, the spot price for steaming coal rose close to US\$200 per ton in July 2008 before declining rapidly. It fell to a US\$60-80 range in 2009 and remained below US\$100 in 2010. Coking coal prices for Japan under long-term contracts remained above US\$250 in FY 2008, slipped below US\$200 in May 2009 and fell rapidly. From October 2009, coking coal prices remained around US\$120. We would like to consider how the global recession affected Australia's coal production and exports under such situation.

Fig. 2-1 Monthly Average FOB Prices of Australian Coal



Notes : Coking coal: a monthly average export price of Queensland hard coking coal for Japan as compiled and published by Energy Publishing Inc.

Steaming coal: a monthly average spot price of steaming coal for shipments from Australia's Newcastle (NEX Spot Index, formerly Barlow Jonker Index) as compiled and published by Energy Publishing Inc.

Source : Prepared from Australian Coal Report, Energy Publishing Inc. (formerly Barlow Jonker Pty. Ltd.)

2-1 Impacts on Coal Production⁴

Table 2-1 indicates Australia's quarterly coal production excluding brown coal between 2007 and 2009. The nation's quarterly coal output ranged from 78.5 million tons to 86.4 million tons in 2007, from 73.5 million tons to 88.6 million tons in 2008 and from 73.6 million tons to 93.5 million tons in 2009. Annual output came to 326.9 million tons (a quarterly average at 81.7 million tons) in 2007, 332.1 million tons (a quarterly average at 83.0 million tons) in 2008 and 344.7 million tons (a quarterly average at 86.2 million tons) in 2009. Both Queensland and New South Wales increased coal production steadily. These data indicate that the global recession since autumn of 2008 has had no negative impact or downward pressures on annual coal output in Australia.

⁴ Data given in this section are based on coal production statistics as published by the Australian Bureau of Agricultural and Resource Economics (ABARE).

Table 2-1 Australia's Quarterly Coal Output (excluding brown coal)

(in millions of tons)

	2007					2008					2009				
	1st quarter	2nd quarter	3rd quarter	4th quarter	Total	1st quarter	2nd quarter	3rd quarter	4th quarter	Total	1st quarter	2nd quarter	3rd quarter	4th quarter	Total
NSW	31.7	32.3	36.0	32.7	132.7	32.3	34.0	35.3	35.2	136.8	31.3	34.2	39.7	37.9	143.1
QLD	44.2	47.0	47.8	44.6	183.5	38.6	50.0	45.0	50.6	184.2	39.5	51.4	50.9	48.6	190.4
Others	2.6	2.6	2.7	2.7	10.6	2.7	2.8	2.8	2.8	11.1	2.8	2.8	2.8	2.8	11.3
Total output	78.5	81.9	86.4	80.0	326.9	73.5	86.8	83.1	88.6	332.1	73.6	88.4	93.5	89.3	344.7

Note : "Others" covers coal output in South Australia, West Australia and Tasmania. Coal output for exports is limited to production in New South Wales and Queensland.

Source : Prepared from "Australian mineral statistics December quarter 2009" on the ABARE website

But quarterly output in Queensland fluctuated wildly in 2008 and 2009. A coal output drop in Queensland in the first quarter of 2008 came as torrential rains in January and February forced production to be suspended at open-pit coalmines. Queensland's coal output in the third quarter of 2008 and the first quarter of 2009 was less than in the previous and subsequent quarters. The drop may be attributable to an export demand slump under the global recession. Coal output in New South Wales in the first quarter of 2009 was also less than in the previous and subsequent quarters. But it is difficult to decide whether this drop is attributable to a seasonal export demand change or the global recession.

Table 2-2 indicates year-to-year changes in quarterly coal output in 2009. Year-to-year drops were recorded only in the first quarter for New South Wales and in the fourth quarter for Queensland. The drops ranged from 1 million tons to 2 million tons. In other quarters, output leveled off or increased from a year earlier. Both states scored year-to-year growth in coal output in the third quarter. In Queensland, the growth was attributable to an output fall under the export demand slump in the third quarter of 2008 and a recovery in the same quarter of 2009. In New South Wales, however, production in the third quarter of 2009 simply increased from the same quarter of 2008. Anyway, annual coal output in Australia maintained an upward trend, indicating that the global recession had exerted no serious impact on Australia's coal industry (output).

Table 2-2 Year-to-year Changes in Australia's Coal Output in 2009

	Year-to-year Changes in Australia's Coal Output in 2009 (in millions of tons)				
	1st quarter	2nd quarter	3rd quarter	4th quarter	Total
NSW	-0.96	0.17	4.45	2.68	6.34
QLD	0.90	1.31	5.94	-1.98	6.17
Others	0.08	0.06	0.00	0.00	0.14
Total output	0.01	1.54	10.40	0.70	12.65

Source : Prepared from "Australian mineral statistics December quarter 2009" on the ABARE website

2-2 Impacts on Coal Exports (increased coal exports to China)

As indicated in Table 2-3, both Queensland and New South Wales steadily boosted their coal exports from 2008 to 2009. Australia's total coal exports expanded 14 million tons from 2008 to 2009. Steaming coal exports increased steadily while coking coal export growth slackened. Particularly, demand for steaming coal from Queensland posted a large increase, while the state's coking coal exports in 2009 decreased slightly on a decline in coking coal demand in Japan and Europe under the influence of the global recession. Meanwhile, New South Wales expanded both coking and steaming coal exports steadily in 2009. Australia's coal export increase in 2009 represented a rise in steaming coal exports.

Australia's monthly coal exports ranged from 16.5 million tons to 27.0 million tons between January 2008 and December 2009. Coking coal's share of Australia's total coal exports in the nine months (from January to September 2008) before the global recession is compared with that in nine months (from October 2008 to June 2009) after the recession's start. The share in the pre-recession period stood at 53.7% (average monthly exports at 21.6 million tons including 11.6 million tons in coking coal and 10.0 million tons in steaming coal) against 48.3% (average monthly exports at 21.5 million tons including 10.4 million tons in coking coal and 11.1 million tons in steaming coal). While total exports changed little after the start of the global recession, exports declined for coking coal and increased for steaming coal.

Table 2-3 Australia's Coal Exports by Category and State in 2008 and 2009

(in millions of tons)

	QLD exports			NSW exports			Total exports		
	Coking coal	Steaming coal	Total	Coking coal	Steaming coal	Total	Coking coal	Steaming coal	Total
2007	112.5	41.1	153.6	24.3	72.5	96.7	136.8	113.5	250.3
2008	114.0	44.7	158.7	23.0	79.5	102.5	137.0	124.2	261.2
2009	111.9	56.0	167.9	25.5	81.7	107.1	137.4	137.6	275.1
Year-to-year growth in 2009	-2.1	11.3	9.2	2.5	2.1	4.7	0.4	13.5	13.9

Sources : Prepared from data published by Queensland and New South Wales State Governments and information on TEX Report

A decline in coking coal exports and a rise in steaming coal exports after the global recession start can be confirmed in Table 2-4 that indicates year-to-year changes in quarterly coal exports in 2009. Coking coal exports posted year-to-year declines in the first and second quarters of 2009, scored an upturn in the third quarter and recorded an increase in the fourth quarter to offset the drop in the first two quarters. Meanwhile, steaming coal exports continued year-to-year growth throughout 2009.

Table 2-4 Comparison of Year-to-year Changes in Australia's Coal Exports by Coal Type in 2009

	Year-to-year Changes in Australia's Coal Exports in 2009 (in thousands of tons)				
	1st quarter	2nd quarter	3rd quarter	4th quarter	Total
Coking coal	-3,102	-3,130	1,295	5,367	429
Steaming coal	1,778	5,859	3,238	2,590	13,465
Total exports	-1,324	2,729	4,532	7,957	13,894

Sources : Prepared from data published by Queensland and New South Wales State Governments and information on TEX Report

Table 2-5 indicates year-to-year changes in Australia's coal exports broken down by destination in 2009. Exports to Japan and Europe declined sharply throughout the year. Those to Taiwan also decreased. In a manner to make up for the decline, exports to China expanded sharply. Those to India and South Korea also increased throughout the year. As a result, exports in 2009 rose 13.9 million tons from 2008 to 275.1 million tons.

Tables 2-6 (coking coal) and 2-7 (steaming coal) indicate quarterly coal exports broken down by coal category. Coking coal exports to China increased sharply. Those to India also increased on an annual basis. But coking coal exports to other destinations declined. Particularly, exports to Japan and Europe posted substantial declines. Those to South Korea, South and North America and Taiwan also showed not-so-small drops. Steaming coal exports to Japan logged a large decline, while those to China posted a large increase. Exports to South Korea, South and North America, and India also expanded.

Table 2-5 Comparison of Year-to-year Changes in Australia's Coal Exports in 2009 Broken down by Destination

Export destination	Year-to-year Changes in Australia's Coal Exports in 2009 (in thousands of tons)				
	1st quarter	2nd quarter	3rd quarter	4th quarter	Total
Asia	2,738	8,733	9,567	9,863	30,901
Japan	-4,282	-8,780	-3,202	-495	-16,759
South Korea	2,678	1,120	1,698	-3,482	2,014
Taiwan	-292	-594	303	-745	-1,329
China	5,142	15,939	11,786	12,365	45,231
India	-286	913	-632	2,796	2,792
Other Asian destinations	-223	135	-385	-575	-1,048
South and North America	-379	-281	427	887	654
Europe	-3,175	-4,944	-4,458	-2,419	-14,996
Others	-508	-779	-1,004	-375	-2,666
Total exports	-1,324	2,729	4,532	7,957	13,894

Sources : Prepared from data published by Queensland and New South Wales State Governments and information on TEX Report

Table 2-6 Comparison of Year-to-year Changes in Australia's Coking Coal Exports in 2009 Broken down by Destination

Export destination	Year-to-year Changes in Australia's Coking Coal Exports in 2009 (in thousands of tons)				
	1st quarter	2nd quarter	3rd quarter	4th quarter	Total
Asia	1,427	3,304	7,264	6,716	18,710
Japan	-1,525	-5,066	-1,925	-1,303	-9,820
South Korea	-270	-1,189	1,113	-2,414	-2,761
Taiwan	-624	-319	353	-650	-1,241
China	4,721	9,577	8,419	8,586	31,303
India	-368	786	-660	2,387	2,145
Other Asian destinations	-507	-484	-35	110	-916
South and North America	-1,396	-1,042	-579	389	-2,627
Europe	-2,550	-4,735	-4,444	-1,851	-13,579
Others	-583	-658	-947	112	-2,075
Total exports	-3,102	-3,130	1,295	5,367	429

Sources : Prepared from data published by Queensland and New South Wales State Governments and information on TEX Report

Table 2-7 Comparison of Year-to-year Changes in Australia's Steaming Coal Exports in 2009 Broken down by Destination

Export destination	Year-to-year Changes in Australia's Steaming Coal Exports in 2009 (in thousands of tons)				
	1st quarter	2nd quarter	3rd quarter	4th quarter	Total
Asia	1,312	5,429	2,304	3,147	12,191
Japan	-2,757	-3,714	-1,277	808	-6,939
South Korea	2,948	2,309	585	-1,068	4,774
Taiwan	333	-275	-50	-96	-88
China	421	6,362	3,367	3,779	13,928
India	82	127	28	409	647
Other Asian destinations	284	619	-350	-685	-131
South and North America	1,017	761	1,005	498	3,282
Europe	-625	-210	-14	-568	-1,417
Others	74	-121	-57	-487	-591
Total exports	1,778	5,859	3,238	2,590	13,465

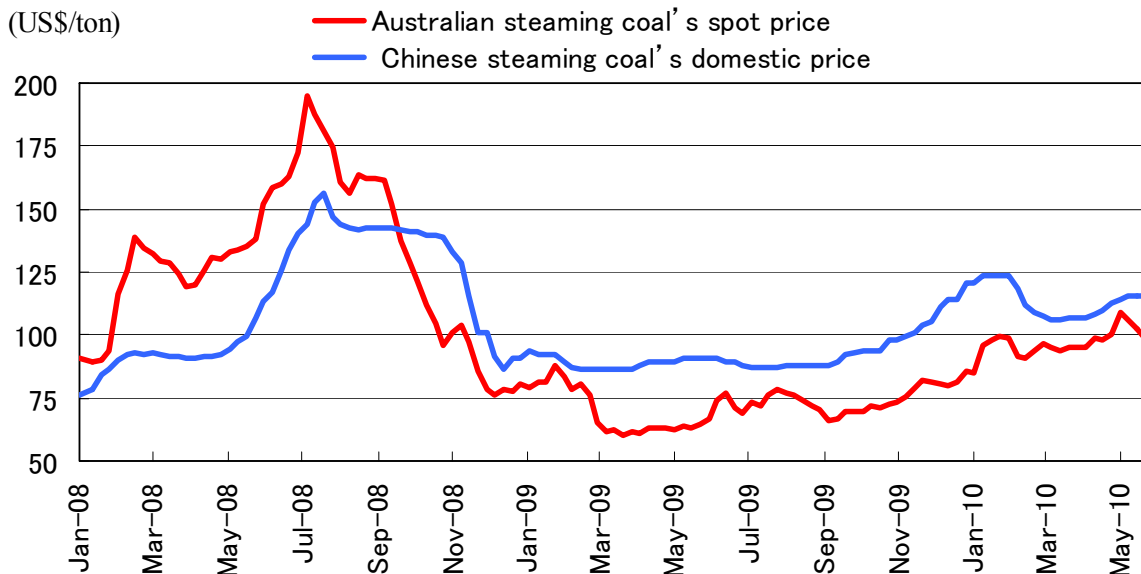
Sources : Prepared from data published by Queensland and New South Wales State Governments and information on TEX Report

Australia's coking coal exports to Japan and Europe declined as their steel production decreased along with their coking coal demand on stagnation under the global recession. Meanwhile, China scored a strong real increase of 8.7% in GDP in 2009 and expanded crude steel output 13% to 566 million tons⁵, serving as the driver of the world's economic growth. China's domestic coking coal production falls short of meeting its demand, prompting the country to

⁵ See Reuters (<http://jp.reuters.com/article/worldNews/idJPJAPAN-13448820100121>), etc.

depend on imports to make up for the shortfall. This is the reason for Australia’s coking coal exports increasing even under the global recession. As China’s electricity demand has continued expanding on the economic growth, domestic prices of coal for power generation have remained above international levels. (See Fig. 2-2. In China’s southern coastal region, imported coal prices including freight are lower than domestic coal prices.) Therefore, China has expanded steaming coal imports as well. In response, Australia has increased steaming coal exports as well.

Fig. 2-2 Australian Steaming Coal’s Spot Price and Chinese Steaming Coal’s Domestic Price



Note : Australian steaming coal’s spot price: NEWC Weekly Index (Data on the globalCOAL website)
 Chinese steaming coal’s domestic price: Datong steaming coal’s price at Port of Qinghuangdao (from “China Coal Report, Energy Publishing Inc.)
 Sources : Prepared from data on the globalCOAL website and “China Coal Report,” Energy Publishing Inc. (formerly Barlow Jonker Pty. Ltd.)

As indicated in Table 2-8, China’s coal imports in 2009 scored a dramatic increase of 3.1-fold from the previous year to 126.6 million tons, including 34.5 million tons in coking coal (up 5.0-fold), 38.6 million tons in steaming coal (up 3.7-fold), 34.4 million tons in anthracite (up 1.8-fold) and 19.2 million tons in other coal (up 4.5-fold). Imports from Australia jumped 12.6-fold to 44.6 million tons, accounting for 35.2% of China’s total coal imports. Particularly, coking coal imports from Australia swelled 16.8-fold to 22.7 million tons, capturing 65.9% of China’s total coking coal imports. Steaming coal imports from Australia expanded 8.3-fold to 15.8 million tons, accounting for 40.9% of China’s steaming coal imports.

South Korea has increased steaming coal imports from Australia even under the global recession as coal thermal power plants started operations one after another since 2005 to expand consumption of imported steaming coal as fuel. South Korea’s electricity generation sector increased its coal consumption by 12% from 65.8 million tons in 2008 to 73.7 million tons in 2009.

An apparent reason why steaming coal export demand has not slowed down even under a

global recession is that steaming coal as an electricity generation fuel features more stable supply and greater economic efficiency (lower prices and more stable prices) than other fossil fuels.

While Japan and European industrial countries reduced their coal demand and coal imports from Australia under the economic stagnation, China expanded coal demand. Supported by China's coal import expansion, Australia's coal industry was able to expand production and exports even under the global recession.

Table 2-8 China's Coal Imports by Country and Coal Type

(in thousands of tons)

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Steaming coal	Australia	1,174	627	4,257	3,266	2,032	2,449	4,937	2,174	1,894	15,777
	(Australia's share)	(75.1%)	(35.4%)	(55.7%)	(70.6%)	(53.7%)	(43.4%)	(46.9%)	(16.3%)	(18.4%)	(40.9%)
	Indonesia	213	843	1,938	778	1,238	2,350	4,687	10,763	7,538	13,125
	Russia	—	179	1,034	550	502	839	897	208	371	6,021
	Others	177	124	410	32	11	0	1	157	485	3,643
Total		1,564	1,773	7,639	4,626	3,783	5,638	10,522	13,302	10,288	38,566
Coking coal	Australia	116	43	85	1,693	3,248	3,436	1,960	2,285	1,352	22,722
	(Australia's share)	(34.2%)	(15.7%)	(33.1%)	(65.0%)	(48.1%)	(47.8%)	(42.0%)	(36.7%)	(19.7%)	(65.9%)
	Mongolia	—	—	—	263	1,539	2,301	2,154	3,119	3,634	3,980
	Canada	—	—	0	385	1,815	1,229	146	223	560	3,259
	Russia	—	—	—	59	—	58	33	60	214	1,914
	Indonesia	—	—	—	—	37	—	249	420	764	1,814
	New Zealand	223	233	164	205	119	171	113	60	186	243
	Others	0	0	7	0	0	0	7	53	147	560
Total		339	277	256	2,604	6,758	7,194	4,662	6,220	6,857	34,493
Steaming coal + Coking coal	Australia	1,290	670	4,342	4,958	5,280	5,885	6,897	4,459	3,246	38,499
	(Australia's share)	(67.8%)	(32.7%)	(55.0%)	(68.6%)	(50.1%)	(45.9%)	(45.4%)	(22.8%)	(18.9%)	(52.7%)
	Indonesia	213	843	1,938	778	1,275	2,350	4,936	11,183	8,302	14,939
	Russia	—	179	1,034	609	502	897	929	268	585	7,935
	Mongolia	—	—	—	263	1,539	2,301	2,154	3,119	3,634	5,803
	Canada	—	—	0	385	1,815	1,229	146	223	560	4,023
Others	400	357	582	237	130	171	121	270	818	1,859	
Total		1,903	2,050	7,895	7,230	10,542	12,833	15,184	19,522	17,145	73,059
Anthracite	Vietnam	205	357	2,242	2,492	6,116	9,926	20,079	24,612	16,844	24,078
	Australia	—	—	—	—	—	—	—	61	0	4,511
	(Australia's share)								(0.2%)	(0.0%)	(13.1%)
	North Korea	8	86	407	745	1,571	2,804	2,481	3,741	2,537	2,972
	Others	0	0	121	145	132	59	67	1	7	2,827
計		213	444	2,769	3,383	7,819	12,790	22,626	28,414	19,388	34,388
Other coal	Indonesia	—	—	—	0	40	50	230	2,877	3,313	15,521
	Australia	—	—	—	144	72	0	0	0	297	1,592
	(Australia's share)				(97.3%)	(30.7%)	(0.0%)	(0.0%)	(0.0%)	(6.9%)	(8.3%)
	Others	0	0	147	4	124	456	204	192	691	2,076
Total		0	0	147	148	236	506	434	3,069	4,301	19,189
Total coal imports	Australia	1,290	670	4,489	5,102	5,352	5,885	6,897	4,520	3,543	44,602
	(Australia's share)	(61.0%)	(26.9%)	(41.5%)	(47.4%)	(28.8%)	(22.5%)	(18.0%)	(8.9%)	(8.7%)	(35.2%)
	Indonesia	213	843	1,938	778	1,315	2,400	5,167	14,060	11,615	30,461
	Vietnam	205	357	2,242	2,492	6,177	10,194	20,080	24,612	16,906	24,078
	Mongolia	—	—	—	284	1,601	2,539	2,352	3,241	4,044	6,002
	North Korea	8	86	407	745	1,571	2,804	2,485	3,741	2,537	2,972
	Others	400	536	1,736	1,359	2,580	2,306	1,263	832	2,189	18,521
Total		2,116	2,493	10,811	10,760	18,597	26,128	38,244	51,005	40,834	126,636

Source : Prepared from TEX Report and other data based on China's customs statistics

3. Coal Supply Capacity Development

Australia accounted for 27% of global coal trade in 2008 (Fig. 1-3). Particularly, it has captured more than 50% of global coking coal trade since 2000 (Fig. 1-2). The role that Australia plays in the coal trade market cannot be assumed by any other coal-exporting country. Over recent years, exports accounted for around 84% of total coal output in Queensland and around 72% of total output in New South Wales. It is no exaggeration to say that the two states' coal supply capacity moves the global coal trade market.

3-1 Coal Export Infrastructure Capacity

3-1-1 Coal Export Infrastructure in Queensland

Queensland has four coal-exporting ports with six coal terminals in operation. These coal-exporting ports and coalmines are linked through five railway systems. Following are the four ports as indicated in Fig. 3-1:

- a. The Port of Abbot Point has the Abbot Point Coal Terminal (APCT) in operation and is linked to coalmines through the Newlands railway system.
- b. The Port of Hay Point has the Dalrymple Bay Coal Terminal (DBCT) and Hay Point Coal Terminal (HPCT) in operation and is linked to coalmines through the Goonyella railway system.
- c. The Port of Gladstone has the RG Tanna Coal Terminal (RGCT) and Barney Point Coal Terminal (BPCT) in operation and is linked to coalmines through the Blackwater and Moura railway systems.
- d. The Port of Brisbane has the Fisherman Islands Coal Terminal (FICT) in operation and is linked to coalmines through the Western railway system.

According to the 2009 Coal Rail Infrastructure Master Plan provided by QR Network (a Queensland Railway subsidiary), each railway system's coal handling capacity is compiled as indicated in Table 3-1. At present, Queensland's coal export infrastructure capacity includes 240.8 million tons per year for railway systems and 235.0 million tons per year for ports. Capacity is planned to expand to 473.9 million tons per year for railway systems and 399.0 million tons per year for ports by 2015.

At the Port of Gladstone in Table 3-1, the Wiggins Island Coal Terminal (WICT) is planned as the third coal terminal to be constructed in three stages. In the first stage, a facility with an annual shipping capacity of 25 million tons will be completed by 2013. The capacity will be expanded to 50 million tons in the second stage and to 70 million tons in the third stage in accordance with export demand growth. The 2009 Coal Rail Infrastructure Master Plan projects that the second stage will be completed by 2014 and the third stage by early 2016.

Fig. 3-1 Queensland Coal Export Infrastructure



Source : Queensland Government Department of Infrastructure and Planning (DIP) Website

Table 3-1 Queensland Coal Export Infrastructure Capacity Outlook

(in millions of tons)							
	2009	2010	2011	2012	2013	2014	2015
Newlands System							
Newlands System	19.0	19.0	19.0	50.0	50.0	80.0	80.0
Port of Abbot Point	25.0	25.0	50.0	50.0	50.0	80.0	80.0
APCT	25.0	25.0	50.0	50.0	50.0	80.0	80.0
Goonyella System							
Goonyella System	129.0	129.0	129.0	134.0	140.0	166.0	210.0
Port of Hay Point	129.0	129.0	129.0	134.0	134.0	166.0	186.0
DBCT	85.0	85.0	85.0	90.0	90.0	111.0	111.0
HPCT	44.0	44.0	44.0	44.0	44.0	55.0	75.0
Blackwater/Moura System							
Blackwater•Moura Systems	86.0	86.0	93.0	102.0	102.0	125.0	169.0
Blackwater System	69.0	69.0	76.0	85.0	85.0	85.0	100.0
Moura System	17.0	17.0	17.0	17.0	17.0	40.0	69.0
Port of Gladstone	75.0	75.0	82.0	82.0	100.0	125.0	125.0
RGTCT	68.0	68.0	75.0	75.0	75.0	75.0	75.0
BPCT	7.0	7.0	7.0	7.0	0.0	0.0	0.0
WICT	0.0	0.0	0.0	0.0	25.0	50.0	50.0
Western System							
Western System	6.8	6.8	7.9	10.0	-	-	14.9
Port of Brisbane	6.0	7.0	7.0	7.0	7.0	7.0	8.0
FICT	6.0	7.0	7.0	7.0	7.0	7.0	8.0
Export capacity							
Railway systems	240.8	240.8	248.9	296.0	292.0	371.0	473.9
Ports	235.0	236.0	268.0	273.0	291.0	378.0	399.0

Source : Prepared from “2009 Coal Rail Infrastructure Master Plan” by QR Network, etc.

3-1-2 Coal Export Infrastructure in New South Wales

New South Wales has two coal export infrastructure systems (coal chains) as indicated in Fig. 3-2. One system, called the Hunter Valley coal chain, transports coal from the Hunter, Newcastle, Gunnedah and northern Western coalfields through the Hunter Valley & Gunnedah Basin Rail Network to the Kooragang Coal Terminal (Kooragang CT) and Carrington Coal Terminal (Carrington CT) operated by Port Waratah Coal Services Limited (PWCS) at the Port of Newcastle. The other system transports coal from the Southern and remaining Western coalfields through the Western & Southern Rail Network to Port Kembla.

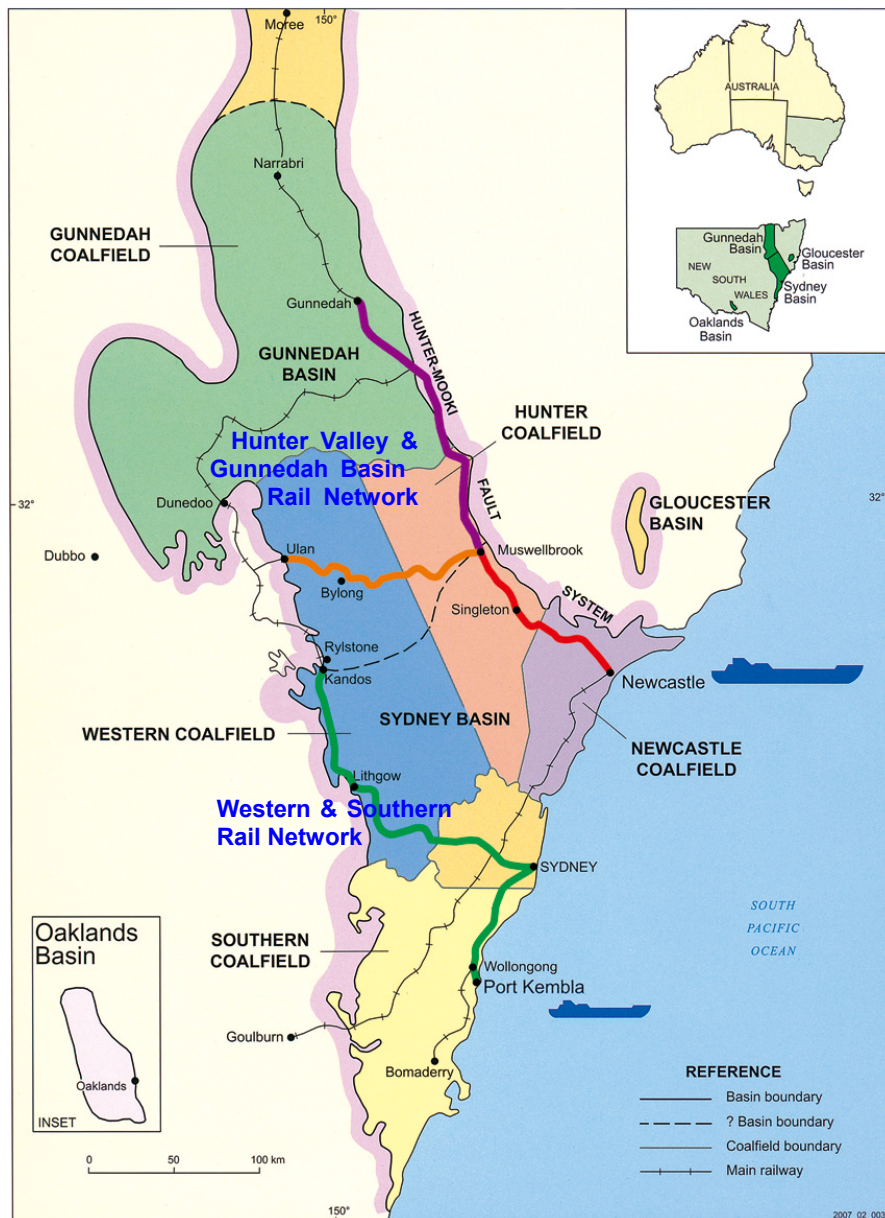
Table 3-2 shows information on the railway system’s capacity for coal transportation to the Port of Newcastle, the port’s coal-handling capacity and Port Kembla’s infrastructure capacity as indicated by “HVCCC and 10-Year Capacity Master Plan Overview from HVCCC⁶.” New South Wales ports’ annual coal export capacity is projected to expand from 131 million tons at present to 208 million tons by 2013. Port Kembla is projected to maintain its present capacity as no plan is

⁶ The Hunter Valley Coal Chain Logistics Team (HVCCLT) was a voluntary group established in 2003 for the two purposes of coordinating coal chains integrally and giving advice on effective investment. HVCCLT was renamed Hunter Valley Coal Chain Coordinator Limited (HVCCC) and became an incorporated body in August 2009.

given for its expansion.

NGIG for the Port of Newcastle in Table 3-2 is the port's third coal terminal to expand its coal export capacity. It is now under construction by Newcastle Coal Infrastructure Group (NDIG) which was founded in August 2004. Under a two-stage project, the terminal will have an annual coal shipping capacity of 30 million tons in the first stage and expand the capacity to 66 million tons in the second stage. Its final authorized capacity will be 66 million tons per year. The terminal has been in operation since late March 2010.

Fig. 3-2 New South Wales Coal Export Infrastructure



Source : “Growth and Development Potential of Coal in New South Wales” by New South Wales Government, November 2009

Table 3-2 New South Wales Coal Export Infrastructure Capacity Outlook

(in millions of tons)						
	2009	2010	2011	2012	2013	2014
Hunter Valley & Gunnedah Basin Rail Network						
Railway transportation capacity	138.0	145.0	165.0	185.0	195.0	195.0
Port of Newcastle						
Kooragang	88.0	88.0	88.0	99.0	99.0	99.0
Carrington	25.0	25.0	25.0	25.0	25.0	25.0
NCIG	0.0	0.0	30.0	30.0	66.0	66.0
Western & Southern Rail Network						
Port Kembla	18.0	18.0	18.0	18.0	18.0	18.0
Export capacity						
Ports	131.0	131.0	161.0	172.0	208.0	208.0

Source : Prepared from “HVCCC and 10 Year Capacity Master Plan Overview” by HVCCC, etc.

3-2 Coal Exports and Infrastructure Capacity

Table 3-3 compares Queensland’s coal export infrastructure capacity and actual exports in 2009. While the coal shipping capacity of the Port of Abbot Point was raised to 25 million tons per year, the coal transportation capacity of the Newlands railway system was limited to 19 million tons per year. The overall coal chain’s capacity was thus limited to 19 million tons per year, exceeding 15.2 million tons in actual exports in 2009. At the Port of Hay Point, the combined coal shipping capacity totaled 129 million tons per year, including 85 million tons for DBCT and 44 million tons for HPCT. The Goonyella railway system’s transportation capacity was also estimated at 129 million tons per year. But actual exports in 2009 were limited to 89 million tons. At the Port of Gladstone, the combined coal shipping capacity came to 75 million tons per year, including 68 million tons for RGTCT and 7 million tons for BPCT. The Blackwater/Moura railway system’s coal transportation capacity was put at 86 million tons. The overall coal chain’s capacity was thus given at 75 million tons per year, far more than 5.58 million tons in actual exports in 2009. The Port of Brisbane had a coal shipping capacity of 6 million tons per year, against 6.8 million tons in

Table 3-3 Queensland Coal Export Infrastructure Capacity and Actual Exports in 2009

(in million tons per year)

	Newlands System Port of Abbot Point	Goonyella System Port of Hay Point	Blackwater/Moura Systems Port of Gladstone	Western System Port of Brisbane	Total
A. Infrastructure capacity	19.0	129.0	75.0	6.0	229.0
B. Actual exports	15.2	89.0	55.8	7.8	167.8
A-B	3.8	40.0	19.2	-1.8	61.2

Notes : “A. Infrastructure capacity” represents the lower of the railway capacity or the port capacity for each system as indicated in Table 3-1.

“B. Actual exports” represents actual exports at each port as published by the Queensland State Government. Exports from those other than the above ports totaled 100,000 tons. Therefore, Queensland’s actual exports in 2009 totaled 167.9 million tons.

Sources : Prepared from data on the website of the Queensland Department of Employment, Economic Development and Innovation, Geological Survey of Queensland, Queensland Mines and Energy

coal transportation capacity for the Western railway system. The overall coal chain’s capacity was capped at 6 million tons. Actual exports in 2009 totaled 7.8 million tons, surpassing the authorized capacity.

In New South Wales, the combined coal shipping capacity at the Port of Newcastle totaled 113 million tons per year as indicated in Table 3-4, including 88 million tons for the Kooragang CT and 25 million tons for the Carrington CT. The Hunter Valley & Gunnedah Basin Rail Network had a coal transportation capacity of 138 million tons per year. The overall coal chain’s capacity came to 113 million tons per year. But actual exports in 2009 were limited to 92.9 million tons. Port Kembla’s coal shipping capacity, based on the transportation capacity of the Western & Southern Rail Network, stood at 18 million tons per year, surpassing 14.2 million tons in actual exports in 2009.

Table 3-4 New South Wales Coal Export Infrastructure Capacity and Actual Exports in 2009

(in million tons per year)

	Hunter Valley & Gunnedah Basin Rail Network Port of Newcastle	Western & Southern Rail Network Port Kembla	Total
A. Infrastructure capacity	113.0	18.0	131.0
B. Actual exports	92.9	14.2	107.1
A-B	20.1	3.8	23.9

Notes : “A. Infrastructure capacity” represents the lower of the Hunter Valley & Gunnedah Basin Rail Network capacity or the port capacity, and the Port Kembla capacity as indicated in Table 3-2. “B. Actual exports” represent actual exports at each port as published by the New South Wales State Government.

Source : Prepared from TEX Report data, etc.

A simple comparison of coal export infrastructure capacity data and actual exports indicates that the hardware infrastructure capacity is sufficient. Actually, however, ship demurrage has become chronic at the Port of Hay Point in Queensland and the Port of Newcastle in New South Wales. Although infrastructure must be developed to meet export demand in order to solve demurrage, the infrastructure capacity exceeded actual exports at the end of 2008. Following are the reasons demurrage emerges despite the sufficient infrastructure capacity:

- Infrastructure cannot be operated efficiently
 - Particularly, Queensland reportedly lacks skilled coal transportation train operators (including locomotive operators and electrical engineers)
 - Trains cannot be arranged time-wise for coal transportation (car arrangement problems and rolling stock shortages).
 - In some cases, coalmine operators fail to smoothly load coal shipments in a manner to

meet the train arrangements.

— Port facility expansion work restricts the operation of loading equipment.

- Coal export demand fluctuates, causing concentration of shipments.
- Natural disasters and other inevitable events may (1) force railway systems to delay coal transportation to ports or (2) force coal loading equipment operations at ports to be delayed.

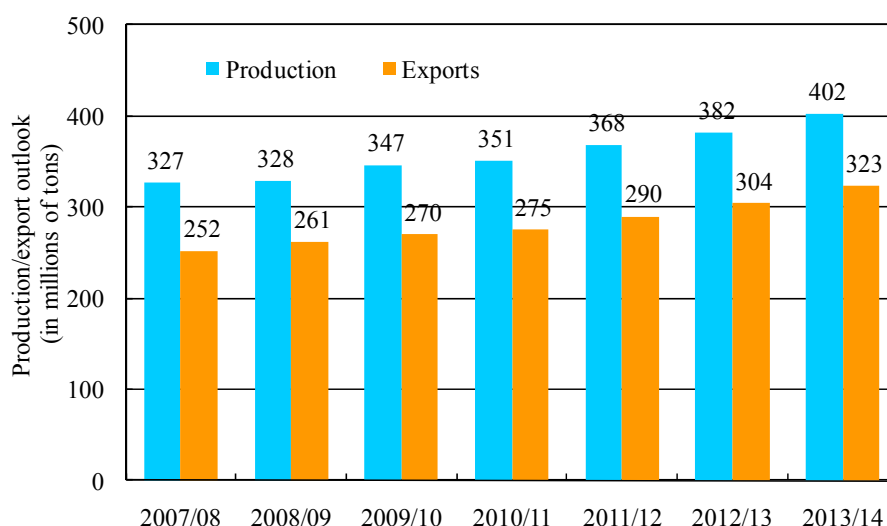
3-3 Coal Supply Capacity Outlook

Fig. 3-3 shows a medium-term outlook for Australia’s coal production and exports as made available by ABARE. The outlook forecasts coal output in FY 2013/14 to increase by 74 million tons from 328 million tons in FY 2008/09 to 402 million tons. Exports are projected to expand by 62 million tons from 261 million tons to 323 million tons.

The Energy Information Administration (EIA) at the U.S. Department of Energy forecasts Australian coal exports to increase as shown in Fig. 3-4. Australia, the world’s largest coal exporter accounting for nearly 30% of global coal trade in 2008, is projected to expand its global coal trade share rather than reducing the share. Particularly, Australia’s share of global coking coal trade is predicted to remain above 50% and rise close to 60%. Australia is not expected to cede the position of the world’s largest coal exporter to any other country in the future.

ABARE’s website publishes information on coalmine development projects (development of new coalmines and expansion of production at existing coalmines) in Queensland and New South Wales. According to information⁷ published in November 2009, the two states have 60 coalmine development projects to increase coal production capacity as indicated in Table 3-5. By 2013 to 2014,

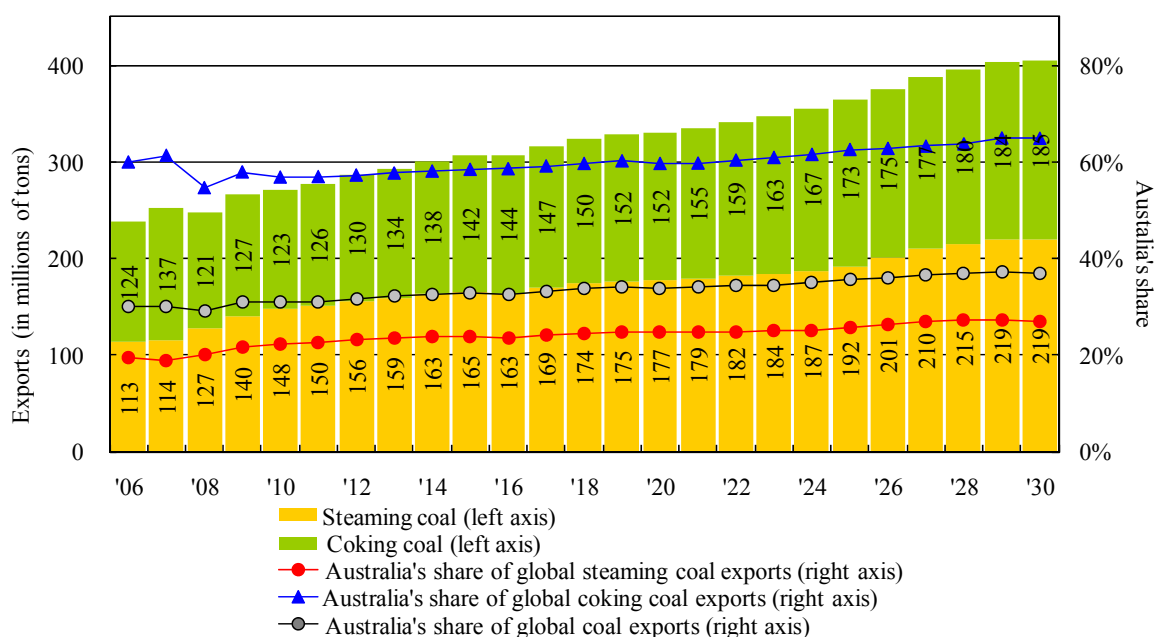
Fig. 3-3 ABARE’s Medium-term Outlook for Australia’s Coal Production and Exports (excluding brown coal)



Source : Prepared from data made available by ABARE

⁷ Information on ABARE website: “Minerals and energy, Major development projects –October 2009 listing” (http://www.abareconomics.com/publications_html/energy/energy_09/energy_09.html)

Fig. 3-4 EIA’s Australian Steaming and Coking Coal Export Outlook (EIA reference case)



Source : Prepared from “International Energy Outlook 2009” by EIA

the two states are expected to add nearly 300 million tons (230 million tons in Queensland and 67 million tons in New South Wales) to their coal production capacity. As shown in Table 2-1, coal output in 2009 totaled 190 million tons in Queensland and 143 million tons in New South Wales. With the termination of production at some coalmines taken into account, coal production capacity in 2013 to 2014 is expected to reach 400 million tons in Queensland and 200 million tons in New South Wales. The two states’ combined capacity may thus rise to 600 million tons. Exports account for 84% of coal output in Queensland and 72% in New South Wales. If these export shares remain unchanged, coal export capacity may reach 340 million tons for Queensland and 140 million tons for New South Wales in 2013 to 2014. The two states’ export capacity may total 480 million tons.

Table 3-5 Australia’s Coal Supply Capacity

	Planned additional production capacity	Production capacity planned to be added by 2013 to 2014	Actual production in 2009	2013-2014	
				Production capacity	Export capacity
QLD	280 million tons or more (25 development and 14 expansion projects)	About 230 million tons	190 million tons	About 400 tons	About 340 tons
NSW	95 million tons or more (11 development and 10 expansion projects)	About 67 million tons	143 million tons	About 200 tons	About 140 tons
Total	375 million tons or more (36 development and 24 expansion projects)	About 297 million tons	333 million tons	About 600 tons	About 480 tons

Note : “2009 actual output” is from Table 2-1. “Production capacity” reflects the termination of production at some coalmines.
Source : Prepared from information on the ABARE website

ABARE’s medium-term outlook, which represents the latest outlook for Australian coal exports, forecasts exports in FY 2013/14 at 323 million tons (Fig. 3-3). The forecast may be easily realized if ABARE-listed coalmine development projects make smooth headway. But investment will have to be continued to allow the construction of new coalmines and the expansion of existing coalmines to make progress as planned. To this end, project operators will have to secure stable customers (coal users) over a long time. These projects are based on the precondition that coal prices suffer no rapid decline.

Table 3-6 compares Australia’s coal export infrastructure capacity for the near future and ABARE’s medium-term coal export outlook. The projected coal export infrastructure capacity far exceeds the forecasted exports, indicating that Australia is planning to develop sufficient coal export infrastructure in line with coal demand growth.

Table 3-6 Australia’s Coal Export Infrastructure Capacity and Export Outlook

(in million tons per year)

			Actual	Forecast						
			2009	2010	2011	2012	2013	2014	2015	
Coal export infrastructure capacity	QLD	Newlands System Abbot Point	19	19	19	50	50	80	80	
		Goonyella System Hay Point	129	129	129	134	134	166	186	
		Blackwater/Moura Systems Gladstone	75	75	82	82	100	125	125	
		Western System Brisbane	6	7	7	7	7	7	8	
		Total	229	230	237	273	291	378	399	
	NSW	Hunter Valley & Gunnedah Basin Rail Network Newcastle	113	113	143	154	190	190	-	
		Western & Southern Rail Network Port Kembla	18	18	18	18	18	18	-	
		Total	131	131	161	172	208	208	-	
	Total			360	361	398	445	499	586	-
				Actual	Forecast					
2009				2009/10	2010/11	2011/12	2012/13	2013/14	-	
Coal export results and forecasts			275.1	270	275	290	304	323	-	

Notes : “Coal export infrastructure capacity” represents the lower of the railway transportation capacity or the port shipment capacity for each system as shown in Tables 3-1 and 3-2.

“Actual exports” covers actual exports published by the Queensland and New South Wales State Governments (Table 2-3).

“Forecast exports” is from ABARE’s medium-term outlook as shown in Fig. 3-3.

Sources : Prepared from Tables 3-1, 3-2 and 2-3 and Fig. 3-3

Conclusion

The following points are important for Australia's maintenance or expansion of coal supply capacity:

- Coal transportation demand is projected as infrastructure operators predict future coal shipments based on their take or pay contracts with coal suppliers. Based on the projection, the operators decide on coal export infrastructure development projects (including specific timetables and sizes). If coal transportation (export) demand projections fail to be made accurately, a mismatch may emerge between actual export demand and infrastructure capacity. Accurate export demand projections and timely coal export infrastructure development (including the expansion of rolling stock) based on such projections are indispensable.
- Infrastructure operators must seek to take full advantage of infrastructure capacity through efficient operations. Railway system operators must secure and continuously train relevant skilled personnel (including locomotive operators and electrical engineers). Infrastructure operators must make positive efforts to improve operations to fully utilize hardware infrastructure capacity.
- Coal demand fluctuates. Coal users can cooperate in resolving the concentration of shipments. Coal suppliers and users should deepen mutual understanding and considerations. Infrastructure operators must predict natural disasters and other inevitable problems and be prepared to respond quickly to such problems.
- Ship demurrage is a major problem that prevents coal users from procuring coal in a timely manner. But it does not work to reduce demand for Australia coal exports. If excessive demurrage becomes chronic, however, coal users may be prompted to shift to other coal-exporting countries or ports. In such case, demand for Australian coal exports may decline. Australian coal export infrastructure operators must accurately predict coal export demand, develop infrastructure with capacity meeting the predictions, and have human resources for taking full advantage of infrastructure capacity and management know-how for efficient infrastructure operations.

The Australian coal industry is very eager to expand coal exports, expecting to increase exports to China and India. It understands that Japan's coal demand (imports) will level off or decrease slightly in the future. As a result, Japan's presence as Australia's coal export destination may decline relatively. In order to maintain stable coal supply from Australia, Japan must make even greater efforts to maintain good bilateral relations. Japan should not only acquire stakes in coalmines directly but also invest and participate widely in coal export infrastructure and coal-related industries in Australia.

At present, Australia is discussing the legislation of the Carbon Pollution Reduction Scheme and the introduction of the Resources Super Profits Tax (RSPT). They may affect Australia's coal

supply capacity depending on future policy directions. We will have to closely watch how the Australian coal industry will respond to new federal government policies. In Australia on June 24, 2010, Kevin Rudd from the Labor Party resigned as prime minister and Deputy Prime Minister Julia Gillard from the same party took up the premiership. After the prime minister replacement, the government on July 2, 2010, withdrew the Resources Super Profits Tax scheme that had come under fire among mining and other companies and indicated a plan to introduce the Minerals Resources Rent Tax (MRRT) to be levied only on iron ore and coal.

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