Report

The Japanese Coal Market

Japan Office for the State of Alaska

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I. Introduction

The State of Alaska Japan office conducted a coal market survey on Japanese market during fiscal 2001. The main purpose of the survey was to investigate the potential for exporting coal from Alaska to the Japanese market.

For the reference of Alaskan coal suppliers, copies of purchase contracts for steam coal signed by Japanese electric power companies in past several years are attached to this report.

II. Overview of the Japanese Coal Market

According to a report titled, "Energy in Japan, February 2000", released by MITI, the coal demand in Japan amounted to 130 million metric tons in FY1998. Coal makes up 16.4% of the primary energy supply of Japan. **The demand for steam coal constitutes 50.1% of the total coal demand** and of that coking coal, 47.2%. The iron and steel industry utilizes 91.9% of the coking coal and the electric power industry uses **70% of the steam coal. The steam coal currently used by the electric industry is mainly bituminous coal.**

The imported coal amounted to 127 million tons in FY1998 making up more than 97% of the domestic coal demand. Japan is the largest coal importing country in the world. In 1997 this constituted a 26% share of world coal imports, purchased mainly from Australia, Indonesia, and the China.

The Japanese demand for coal, in particular steam coal, is expected to increase. It is estimated that the coal supply will increase to 134 million tons in FY2010. The worldwide coal demand will also increase greatly, particularly in the developing countries.

This report will focus on the steam coal market, as this is the type of Alaskan coal available for export.

III. Supply and Demand for Electric Power Over the Next Decade as Projected by Major Japanese Electric Power Companies

As mentioned above, end users for steam coal in Japan are mostly electric power companies. There are ten electric power companies in Japan that have been granted permits to operate and provide electricity under the Electric Utilities Industry Law.

They are: Hokkaido Electric Power Co., Inc., Tohoku Electric Power Co., Inc., Tokyo Electric Power Company, Chubu Electric Power Co., Inc., Hokuriku Power Electric Power Co., Inc., The Kansai Electric Power Co., Inc., Chugoku Electric Power Co., Inc., Shikoku Electric Power Co., Inc., Kyushu Electric Power Co., Inc., and Okinawa Electric Power Co., Inc.

These ten electric power companies, and some major electricity wholesalers, submit their 10-year long-term plans for new power plant constructions, together with their projections for power supply and demand, to the Ministry of Economics, Trade and Industry (formerly MITI) each year. METI gathers all data from each company and issues a report called, "Electricity Supply and Demand Plan by Electric Power Companies". The report for 2001 was just issued March 2001. The following tables show their projections for supply and demand and their plans for the construction of new coal-fired power plants.

Table – 1
Prospects for Electric Power Demand (Electric Industry in General)

	1999 (Actual)	2000 (Actual & Estimate)	2001	2005	2010
Total Demand (100 mil. KWh)	8,169	8,354	8,359	8,937	9,644
Max Peak Load (10,000 kw)	16,567	16,982	17,311	18,488	19,897
Annual Load Factor(%)	59.4	59.5	58.4	58.5	58.6

Note: FY2000 is based on actual figures for April to December and estimates for January-March

Table– 2
Power Generation Capacity (Electric Industry in General)

Unit: 10,000 kW

	1999 Actual	(%)	2000	(%)	2005	(%)	2010	(%)
Hydro Power Plants	4,433	(19.8)	4,478	(19.5)	4,568	(18.6)	4,810	(17.7)
Conventional	2,002	(8.9)	2,008	(8.8)	2,053	(8.4)	2,069	(7.6)
Pumped	2,431	(10.8)	2,471	(10.8)	2,516	(10.2)	2,741	(10.1)
Thermal Power Plants	13,486	(60.2)	13,943	(60.9)	15,068	(61.4)	16,274	(59.8)
Coal	2,488	(11.1)	2,922	(12.8)	3,975	(16.2)	4,413	(16.2)
LNG	5,677	(25.3)	5,722	(25.0)	5,888	(24.0)	6,696	(24.6)
Oil	4,860	(21.7)	4,839	(21.1)	4,731	(19.3)	4,694	(17.2)
LPG	53	(0.2)	53	(0.2)	53	(0.2)	50	(0.2)
Other Gas	306	(1.4)	306	(1.3)	332	(1.4)	332	(1.2)
Bituminous Composed	51	(0.2)	51	(0.2)	35	(0.1)	35	(0.1)
Geothermal	52	(0.2)	52	(0.2)	54	(0.2)	54	(0.2)
Nuclear Power Plants	4,492	(20.0)	4,492	(19.6)	4,958	(20.2)	6,185	(22.7)
Undecided	0	(0.0)	0	(0.0)	-39	(-0.2)	-39	(-0.1)
GRAND TOTAL	22,410	(100.0)	22,913	(100.0)	24,555	(100.0)	27,229	(100.0)

Table – 3
Power Supply (Electric Industry in General)

Unit: 100 Million kWh

	1999 Actual (%)	2000 (%)	2005 (%)	2010 (%)
Hydro Power Plants	893 (9.7)	905 (9.6)	969 (9.6)	993 (9.1)
Conventional	769 (8.4)	776 (8.2)	795 (7.9)	802 (7.4)
Pumped	123 (1.3)	129 (1.4)	175 (1.7)	191 (1.7)
Thermal Power Plants	5,097 (55.5)	5,280 (56.1)	5,546 (54.9)	5,522 (50.7)
Coal	1,529 (16.7)	1,681 (17.9)	2,069 (20.5)	2,015 (18.5)
LNG	2,405 (26.2)	2,491 (26.5)	2,388 (23.6)	2,502 (23.0)
Oil	985 (10.7)	935 (9.9)	874 (8.7)	792 (7.3)
LPG	22 (0.2)	28 (0.3)	54 (0.5)	50 (0.5)
Other Gas	115 (1.3)	108 (1.1)	121 (1.2)	122 (1.1)
Bituminous Composed	6 (0.1)	3 (0.0)	3 (0.0)	3 (0.0)
Geothermal	34 (0.4)	34 (0.4)	37 (0.4)	37 (0.3)
Nuclear Power Plants	3,165 (34.5)	3,197 (34.0)	3,547 (35.1)	4,334 (39.8)
IPP	21 (0.2)	23 (0.2)	43 (0.4)	43 (0.4)
Undecided	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
GRAND TOTAL	9,176 (100.0)	9,405 (100.0)	10,105 (100.0)	10,893 (100.0)

Table – 4

Planned Coal-Fired Power Plants in the Electric Power Industry

Unit: 1,000 kw

Electric Power Company	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Hokkaido EPC			Tomato-Atsuma #4 (700) (June)									700
Tohoku EPC										Noshiro #3 (600) (March)		600
Tokyo EPC					Hirono #5 (600) (July) Hitachi-Naka #1 (1,000) (Dec. 2004)							1,600
Chubu EPC			Hekinan #4 (1,000)(Nov 2001)	Hekinan #5 (1,000) (Nov 2002)								2,000
Hokuriki EPC		Tsuruga #2 (700) (Sept 2000)										700
Kansai EPC					Maizuru #1 (900) (Aug)						Maizuru #2 (900) (Aug)	1,800
Chugoku EPC		Ohsaki #1-1 (250) (Dec 2000)					Ohsaki #1-2 (250) (Dec 2005)	Misumi #2 (400) (July)				900
Shikoku EPC	Tachiba-nawan #1 (700) (June)											700
Electric Power Company	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2009**	**2010**		**Total**

									8			
Kyushu EPC	Miike Karyoku (156) (April)	Karita Shin #1 (360) (July)		Reihoku #2 (700) (July)		Matsu-ura #2 (1,000) (July)						2,216
Okinawa EPC			Kin #1 (220) (Feb.)	Kin #2 (220) (May)								440
EPDC	Tachiba - nawan #1 (1,050) (July)	Tachiba - nawan #2 (1,050) (Dec 2000)	Shin-Isogo #1 (600) (April)							Shin-Isogo #2 (600) (July)		3,300
Total of 10 EPC and One Whole-Saler	1,906	2,360	2,520	1,920	2,500	1,000	250	400		1,200	900	14,956

Table – 5
Coal Fired Power Plants in Operation in Electric Power Industry

Electric Power Company	Power Station	Turbine (1,000 kw)	Start-up	Total (1,000 kw)
Hokkaido EPC	Sunakawa #3	125	6 – 1977	1,635
	Sunakawa #4	125	5 – 1982	
	Naie #1	175	5 – 1968	
	Naie #2	175	2 – 1970	
	Tomato Azuma #1	350	10 – 1980	
	Tomato Azuma #2	600	9 – 1985	
	Tomato Azuma #3	85	3 – 1998	
Tohoku EPC	Sendai #1	175	10 – 1959	3,725
	Sendai #2	175	11 – 1960	
	Sendai #3	175	6 – 1962	
	Noshiro #1	600	6 – 1963	
	Noshiro #2	600	6 – 1993	
			12 – 1994	
	Haramachi #1	1,000		
	Haramachi #2	1,000	7 – 1997	
			7 – 1998	
Chubu EPC	Hekinan #1	700	10 – 1991	2,100
	Hekinan #2	700	6 – 1992	
	Hekinan #3	700	4 – 1993	
Hokuriku EPC	Tsuruga #1	500	10 – 1991	1,700
	Nanao Ota #1	500	3 – 1995	
	Nanao Ota #2	700	7 – 1998	
Chugoku EPC	Mizushima #1	125	11 – 1961	2,456
	Mizushima #2	156	8 – 1963	
	Shin Onoda #1	500	4 – 1968	
	Shin Onoda #2	500	1 – 1987	
	Shimonoseki #1	175	3 – 1967	
	Misumi #1	1,000	7 – 1998	
Shikoku EPC	Saijo #1	156	11 – 1965	406
	Saijo #2	250	6 – 1970	
Kyushu EPC	Minato #1	156	9 – 1960	1,712
	Omura #2	156	8 – 1989	

	Matsuura #1 Reihoku #1	700 700	7 – 1989 12 – 1995	
Okinawa EPC	Gushikawa #1 Gushikawa #2	156 156	3 – 1994 3 – 1995	312
EPDC	Isogo #1 Isogo #2 Takasago #1 Takasago #2 Takehara #1 Takehara #2 Takehara #3 Matsushima #1 Matsushima #2 Matsuura #1 Matsuura #2 Ishikawa #1 Ishikawa #2	265 265 250 250 250 350 700 500 500 1,000 1,000 156 156	5– 1967 9– 1969 7 – 1968 1 – 1969 7 – 1967 7 – 1995 3 – 1983 1 – 1981 6 – 1981 7 – 1990 7 – 1997 11 – 1986 3 – 1987	5,642
Sakata	Sakata #1 Sakata #2	350 350	10 – 1977 7 – 1992	700
Soma	Shinchi #1 Shinchi #2	1,000 1,000	7 – 1994 7 – 1995	2,000
Joban	Nakoso #7 Nakoso #8 Nakoso #9	250 600 600	10 – 1970 9 – 1983 12 – 1983	1,450
Toyama	Toyama Shinko #1 Toyama Shinko #2	250 250	9 – 1971 6 – 1972	500
Sumitomo	Niihama East #1 Nihama East #2 Niihama West #1 Niihama West #2	22.5 22.0 75 75	2 – 1969 12 – 1966 8 – 1959 9 – 1962	194.5
TOTAL:				24,532.5

Source: Coal Market Survey, 2000-2001, issued by Energy Keizai Center, Inc. April 2001

IV. Contracts for Coal Signed by Japanese Electric Power Companies

The "Coal Market Survey 2000-2001" issued by Energy Keizai Center, Inc. reported the following trends in tendered prices for imported coal by the electric power industry in recent years.

FY1997 The Chubu Electric Power Co., purchased imported coal by tender to the amount of 1,400,000 tons. As the oversupply became evident in New Castle N.S.W., Australia, successful tender prices continued to decline to FOBUS$25.00/25.50 in the second half of FY1997 from FOBUS$27.00/28.00 (6,700 kcal/kg basis) earlier in spring of the same year. This price level was actually lower than the FY1997 benchmark price of US$37.65 by US$12.65. The main factor for this market crash was apparently the stockpile of surplus coal. However, as the tender business is usually confined to coal already in use or under contract, most suppliers tend to participate in order to qualify for the next tender.

FY1998 The electric power industry purchased by tender some 4,000,000 tons of imported coal for shipment in FY1998. While the dates when the tenders were made and contract conditions differed, the FOB prices accepted were all within US$20.00/21.00 range.

FY1999 The total quantity purchased by tender reached 6,600,000 tons. The standard FOB prices were generally US$21.50/23.00 (ADR6, 700 kcal/kg) for the first half of FY1999. This price level was considered the lowest limit for subsequent spot transactions for general industries. The first tender, held by Shikoku Electric Power Co. in the second half of FY1999 served as a prelude to the long-term contract for Tachibana-wan Thermal Power Plant, generating the base market for subsequent tenders by other electric power companies. The lowest bid price accepted by users was US$19.50/20.00. The shippers' contract prices were US$22.00/23.00 for the first half of FY1999 and US$20.50/22.00 for the second half, resulting in a reduction of US$1.50.

FY2000 Steam coal prices are improving from a low of US$20.00 as of the beginning of 2000. In December 2000 the FOB price for South African steam coal rose to US$34.00 on a spot basis, and Australian steam coal marked FOBUS$28.00.

In Japan, although long-term purchase contracts will continue to be the main type of contract, the 10-year contract will be discontinued. Electric power companies started importing coal in 1980. At that time, securing stable coal supply was given higher priority than monetary concerns so that 10-year contracts were the norm. Three- to five-year contracts are now more common. Tendered sales and/or spot sales have also been increasing sharply in recent

years and comprise about 30% of total contracts. This situation will continue in the coming years.

In general, Japanese electric power companies will start looking for sources to supply their new coal-fired power plants three years prior to starting operations and will finalize their selection process the following year. Purchase agreements will be signed one year prior to the start of operation. Suppliers, for their part, will approach to electric power companies on the basis of their 10-year long-term plans for new power plant constructions to market their coal.

As mentioned earlier, copies of coal purchase contracts of the ten electric power companies from the "Coal Market Survey 2000-2001" are attached to this report.

V. Comments from the Electric Power Industry in Japan

❖ A - Major Japanese Electric Power Companies

Tokyo Electric Power Company, The Kansai Electric Power Co., Inc., Chubu Electric Power Co., Inc., The Chuguku Electric Power Co., Inc., Electric Power Development Co., Ltd.

The Japan Office of the State of Alaska met with the above major electric power companies. Most of them were uncertain about future supply and demand for coal for their companies. The main reasons were: 1) legal reform in the electric power industry, 2) commitment to the COP3-Co2 Emissions Guideline, 3) the economic recession, and 4) METI's revised outlook for long-term energy supply and demand.

1) Legal Reform. Since the Electric Utilities Industry Law was revised in March 2000, users consuming large amounts of electricity now have the freedom to choose their own electric suppliers. This has been creating intense competition among the ten electric power companies.

2) The COP3 Co2 Emissions Guideline. Japan agreed to reduce greenhouse gas emissions by 6%, taking it back to 1990's levels during the first period of commitment between 2008 and 2010. This puts a pressure on electric power companies to refrain from using too much coal even if the price is much lower than for other fossil energy resources.

3) Economic Recession. Japanese electric power companies have cut back their previous year's estimate for increased demand for 2001-2010 from 1.8% to

1.5% because of the extended economic recession.

4) The Japanese government, Ministry of Economics, Trade and Industry (METI) releases a 10-year outlook for Japan's energy supply and demand, occasionally, an outline of how energy supply sources are to be balanced in order to secure sufficient energy. The revised outlook will be released this summer. Few governments in the world produce publications of this kind. Japan is unusual in this respect as it depends on outside countries for most of its energy sources.

Japanese electric power companies will refer to METI's 10-year outlook and will try to follow its guidelines. Electric power companies in the country will study METI's revised outlook and bring their own 10-year plans into line accordingly.

In regard to sub bituminous coal, above electric companies pointed out that as sub bituminous coal is prone to spontaneous combustion, open space around coal-fired power plants is required but most of the coal-fired power plants in Japan are located near residential areas. That was one of reasons for them to not use sub bituminous coal until now.

❖ - Major trading firms

Tomen Corporation, Mitsubishi Corporation, Marubeni Corporation

As you will observe from the purchase contracts of electric power companies, Japanese power companies do not import coal directly. In most cases, they will purchase through Japanese importers, even for spot sales.

The above trading companies have noted the intensifying competition for importing and marketing coal to Japanese end users with the sharp price decline in recent years caused mainly by oversupply. The price of bituminous coal in 1999 hit the bottom with FOB$20, CIF Japan$25-26 and $35-36 delivery price. Under such market conditions, electric power companies have changed their contracts from long-term to shorter term, or even, one-year contracts. Furthermore, electric power companies have been holding tendered spot purchases for each half-year or year within these shorter terms. As a result, there are more opportunities for new suppliers to sell to Japanese end users.

The above trading companies suggested that if Alaskan sub bituminous coal price is lower than **FOB$20.00 and CIF Japan price $23.00 it would be competitive in the Japanese market**.

VI. Estimated Demand for Sub Bituminous Coal

As was mentioned earlier, demand for steam coal by Japanese electric power companies was about 55,000,000 tons in 1999. It is well known that Japan has stuck to steam coal because the boilers in the coal-fired power plants of its power electric companies were designed for only for steam coal. However, in recent years Tokyo Electric Power Company (TEPCO) and Electric Power Development Co., Ltd. (EPDC) have started burning sub bituminous coal mixed with bituminous coal. A few other electric power companies seem to be poised to follow suite.

TEPCO seems especially interested in burning sub bituminous coal since they predict the supply of sub bituminous coal will continue for the mid- and long-term. TEPCO plans to build a new coal-fired power plant in 2004, which will also be able to burn sub bituminous coal. As you will see from the attached translated report issued by MITI in 1999 titled The Working Group on Coal Technology Strategy in 21st Century, predictions are that the demand for low rank coal will increase in Japan in the 21st century.

The rough estimates of imports of sub bituminous coal by both **TEPCO and EPDC are expected to total 100,000 to 150,000 tons annually**. The coal is imported from Indonesia. Both companies anticipate that the quantity will increase slightly in the near future.

VII. Conclusion

We have learned that Japan imports the largest quantity of coal, mostly bituminous coal, in the world. Recent coal market prices have been reasonable, especially inexpensively priced high quality Australian coal. In this sense the Japanese market has been called a "buyer's market" with Japanese end users able to select their suppliers. Although the low prices have recovered slightly in 2000 the buyer's market is expected to continue for some years.

On the other hand, even though a sharp increase is not expected, the demand for low-grade coal will increase in Japan. It was quite encouraging for us to learn that Japan's leader in the electric power industry, TEPCO, has expressed interest and has already been using low grade coal at their coal-fired power plants.

Even though the price competition could be intense for Alaskan coal under the current buyer's market in Japan, it would be worthwhile targeting Japan a potential coal market for the near future. The State Japan office will continue gathering an updated coal market information of Japan and report to any interested Alaskan companies.

VIII. Attachments

Energy Keizai Center, Inc. Statistics from Coal Market Survey – 2000-2001.

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IX. References

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