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1995 Asia Investment Survey

Coal, Private Power, and Technology

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1995 Asia Investment Survey

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EXECUTIVE SUMMARY

- *There is a mismatch between the largest markets for power plants and SO_x control technologies and the countries with the better investment climates in Asia. Countries with the best investment climates tend to have smaller investment opportunities for power plants and SO_x control technologies.*
- *The two best investment climates for coal mines (Australia and Indonesia) account for more than 80 percent of the private sector investments in coal mine developments in Asia.*
- *Australia, Indonesia, and Thailand have the best overall investment climates for power plants and/or coal mines, while Pakistan, China, and Vietnam are ranked as the three least favorable investment climates in Asia.*
- *The largest markets for private investors in power plants in Asia are China, India, and Indonesia, while Hong Kong, Japan, and Australia have the smallest markets.*
- *China, India, and Indonesia have the largest potential markets for SO_x control equipment, while Vietnam, Hong Kong, and Australia have the least potential.*
- *Companies do not use a consistent method for project profitability, nor do companies have similar target profitability levels (internal rate of return—IRR). However, most companies indicate target IRRs above 15 percent for most Asian economies.*
- *The target IRR set by investors for China is the highest for any Asian economy, followed by Vietnam, Pakistan, and India. The lowest target IRRs are for Japan, Australia, and Taiwan.*

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- *A ranking of countries using Euromoney country credit risk tables is similar, in the case of most economies, to the ranking based on the weighted average IRRs obtained from the survey.*
- *The three most important investment criteria are government policies, legislation regulating foreign investment, and government stability. Japanese and U.S. companies have similar investment criteria, except that the time required to reach agreements and issues related to corruption are more important criteria from the viewpoint of U.S. companies, while tax rates are more important to Japanese companies.*
- *The fuel of choice is coal: 60 percent of the respondents prefer coal, whereas 31 and 9 percent, respectively, prefer natural gas and oil. Investors prefer coal most in China (91 percent), Australia (79 percent), and India (76 percent).*
- *Natural gas is the fuel of choice in Malaysia (74 percent) and Thailand (54 percent).*

SCOPE OF SURVEY

This investment survey attempts to provide an investor's perspective on a number of investment related issues for power plants, coal mines, and SO_x control equipment in Asia. The survey results are used to rank economies according to a number of different measures, including investment climates, market sizes for private power plants and SO_x control equipment, required internal rates of returns (IRR) on investments, preferred fuels for power plants, investment criteria, and comparisons with *Euromoney's* country risk rankings.

The study is limited in terms of the number and types of companies surveyed and the different backgrounds of the respondents. Coal companies, investors in private power plants, and engineering and power plant equipment suppliers can have quite different investment criteria. There are more companies involved in coal-related activities in the survey, and this may have introduced a bias toward coal.

Differences are highlighted where they are clearly apparent from the responses. However, in most cases, the similarities between responses made by different types of companies outweigh the differences. Significant differences between the responses of U.S. companies and those of Japanese companies are discussed in the paper.

The major trends identified indicate company perspectives in mid-1995. The main value of the survey is in reflecting the broader industry perspective on Asian markets, but it has more limited

value in identifying important niche markets. Finally, company responses more heavily reflect existing investment conditions, and in some cases may not reveal longer term opportunities. For example, the negative assessments of Vietnam in the survey do not reflect improving investment conditions that are likely to shift the fuel mix, and to increase private sector investment activity in power plants, gas developments, and perhaps coal mine developments.

COMPANIES SURVEYED

The companies surveyed included primarily power companies, equipment suppliers to the power industry, and coal companies. Out of a total of 121 companies contacted, 56 (46 percent) returned the survey (Appendix 1). If subsidiaries and duplicates are removed, 98 companies were contacted and 50 (51 percent) returned the survey. The six replies from subsidiaries were substantially different from their respective parent companies, in their types of business activity and survey responses, and for these reasons were included in the survey as separate companies.

Figure 1 shows the distribution of respondents by type of business activity. Coal companies represented 30 percent of the responses, followed by power companies (27 percent), engineering and power plant equipment sales companies (23 percent, hereafter referred to as engineering companies), and 20 percent representing companies with more than one business activity.

Figure 1. The Mix of Company Types in the 56 Company Survey

The individuals that returned the survey were mostly from upper management, and often heads of international business departments. Figure 2 shows that U.S. and Japanese firms dominate the survey results, accounting for 45 and 34 percent of the responses, respectively.

Figure 2. Distribution by Country of Companies Included in the Survey

Many companies filled out only a portion of the survey, and the number of companies included in each part of the survey varies considerably. For example 52 companies provided assessments of the investment climate of countries, but only 34 companies provided quantitative information on the more sensitive issue of their target IRRs for investments in projects.

While the authors have attempted to ensure that this report accurately reflects industry views, interpretations of incomplete and contradictory data may have introduced author biases.

INVESTMENT CLIMATES

Respondents were asked to rate the investment climates in those economies where their respective companies have interests in equity participation in coal mines or power plants. Therefore, most companies did not give a rating for every Asian economy. For example, 46 companies gave a rating for China but only 29 companies rated Vietnam.

Overall Investment Climate Ranking

Figure 3, ranks the investment climates of the 13 Asian economies that are significant users of coal in their power sectors. The five economies with good to very good investment climate rankings are Australia (best), Indonesia, Thailand, Malaysia, and Taiwan. The lowest investment climate rankings go to Vietnam, China, and Pakistan, with fair ratings. No economies were rated as having poor investment climates on average, although a number of companies gave poor ratings for the lower ranked economies.

Figure 3. Ranking of Investment Climates in Asian Economies

The ranking for Vietnam in Figure 3 is lower than the country's ranking in a number of recent surveys, and may reflect the more narrow power and coal sector focus of this survey. Possible reasons for Vietnam's low rating in this survey are: lack of experience of investors in this newly emerging market, the small size of its state owned power sector (under 4,000 MW of installed capacity), and the difficulties companies have encountered in trying to obtain an equity interest in coal deposits (anthracite).

China is the largest market in the world for both power plants and coal mine developments, yet after more than a decade and a half of open door policies, China is ranked barely ahead of last-placed Vietnam. Clearly the "honeymoon period" is over from the prospective of investors in coal mines and power plants, owing to a combination of the following factors:

- 1) unresolved differences over the allowable rate of return on power plants;
- 2) government efforts to control high inflation are likely to result in a reluctance to allow adequate and timely electricity tariff increases that are necessary for investors to achieve agreed rates of return;

- 3) protracted negotiations over terms for coal mine and power plant developments;
- 4) uncertainty about China's political and economic future after the death of China's leader, Deng Xiaoping;
- 5) China's growing boldness over contentious international issues (particularly between the United States and China) is making investors more wary of investments in China in the near term; and
- 6) conflicts between provincial (local) and central government interests and authority increase uncertainty to investors.

Coal Company Investment Climate Rankings

The overall ranking of investment climates masks important differences in rankings among the three types of companies included in the survey. Table 1 shows the investment climate ratings and rankings of coal, power and engineering companies. Coal companies rate only two countries—Australia and Indonesia—as better than good investment climates. This is not surprising, because these two economies account for over 80 percent of the private sector investment in coal mines in Asia. Thailand and Malaysia are ranked in third and fourth places, and are rated only slightly below good, even though investment opportunities in coal are limited in both countries.

Table 1. Ranking of Investment Climates

Economy	Investment Climate Rating*				Rank (1=Best)			
	Power	Coal	Engr.	Total	Power	Coal	Engr.	Total
Australia	3.61	3.93	3.00	3.56	1	1	7	1
Indonesia	3.55	3.47	3.27	3.41	2	2	6	2
Thailand	3.47	2.89	3.42	3.26	3	3	2	3
Malaysia	3.47	2.89	3.30	3.20	4	4	5	4
Taiwan	2.94	2.71	3.36	3.03	7	5	3	5
South Korea	2.88	2.57	3.36	2.96	8	7	4	6
Philippines	3.00	2.30	2.91	2.86	6	10	8	7
Japan	2.31	2.33	3.44	2.69	13	9	1	8
India	3.00	2.58	2.38	2.59	5	6	13	9
Hong Kong	2.58	2.38	2.70	2.56	10	8	9	10
Pakistan	2.78	2.00	2.55	2.42	9	11	12	11
China	2.57	1.86	2.57	2.28	11	12	10	12
Vietnam	2.50	1.60	2.56	2.24	12	13	11	13
Sample Size	24	23	17	52	24	23	17	52

* 1=poor, 2=fair, 3=good, 4=very good, and 5=excellent.

The least attractive investment climates for coal mines are Pakistan, China, and Vietnam. Although China ranks number one in Asia with respect to coal reserves, potential foreign investors face serious difficulties in obtaining access to the best deposits on acceptable terms. Vietnam contains possibly the world's largest anthracite reserves close to ports, including large reserves within 25 kilometers of Ha Long Bay in northern Vietnam. A number of problems are preventing large scale foreign investments in this sector, including problems in gaining access to the best Vietnamese reserves, difficulties in dealing with state corporations, inadequate rail and port infrastructure, and limited international markets for anthracite. Pakistan has large low quality coal resources in the Sindh Thar desert and elsewhere, but the commercial viability of these resources has yet to be demonstrated.

Power Company Investment Climate Rankings

As shown in Table 1, power companies rank Australia, Indonesia, Thailand, and Malaysia at the top of their investment climate rankings, midway between good and very good. Among the four countries, Indonesia has the highest level of foreign private sector investments in power plants. Thailand is also receiving substantial foreign investor interest in private power, but there appears to be less activity at present in Australia and Malaysia.

Power companies give the lowest investment climate ratings to Japan, Vietnam, and China. The low rating (fair) for Japan reflects the difficulties faced by potential entrants to Asia's largest, but mature electricity market. Japan has Asia's highest electricity prices, and in the longer term the government is expected to introduce changes in order to increase competition in the power sector.

Engineering and Equipment Company Investment Climate Rankings

Engineering companies rate economies higher than the other companies do, because most of their business is in engineering services and technology sales, and they have more limited exposure to equity investor risks. Engineering companies rate the following seven economies as good or better investment climates: Japan (which jumps to first place), followed by Thailand, Taiwan, South Korea, Malaysia, Indonesia, and Australia. India, Pakistan, Vietnam, and China—all ranked midway between fair and good—are the lowest ranked investment climates.

Comparison of Japanese and U.S. Investment Climate Rankings

Figure 4 compares the investment climate ratings made by Japanese companies with those made by U.S. companies. The diagonal line traces the points at which economies would receive identical ratings from both Japanese and U.S. companies. Economies above the line are rated higher by U.S. companies, and those below the line are rated higher by Japanese companies. Caution is necessary in interpreting small differences in ratings, such as for Indonesia, Taiwan, and

Australia. In Figure 4, the three most significant differences are for Pakistan and India, which are rated higher by U.S. companies, and China, which is rated higher by Japanese companies. The difference for China may be attributable to historical similarities between the Japanese and Chinese cultures and to the geographic proximity of the two countries. The higher rating by U.S. companies of India and Pakistan appears to reflect overtures by these countries to attract foreign investments in power and also reflects greater clarity in the terms and conditions in these countries than in China. The ratings of India and Pakistan could change substantially up or down over the next two years, depending on whether a number of large private power projects move smoothly forward to commercial development.

As expected, Japanese companies give a higher investment climate ranking for Japan than U.S. companies do. More surprising is that Japanese companies vary much more widely in their assessments of Japan's investment climate.

Fair = 2.0; Good = 3.0; Very Good = 4.0

Figure 4. Rating of Investment Climates by Japanese and U.S. Companies

MARKET SIZE FOR PRIVATE INVESTORS IN POWER PLANTS

Figure 5 shows the estimated sizes of the markets for power plants available to private investors over the 1995-2005 period. China and India lead the list with the largest markets, each having a potential for adding a capacity of over 10 GW of private power. Indonesia is the largest in the middle market size range (5-10 GW), followed by Thailand, Pakistan, Philippines, Taiwan, and South Korea. The smallest markets (less than 5 GW each) are Hong Kong, Japan, Australia, Vietnam, and Malaysia.

Figure 5. Ranking of Market Sizes for Private Investors in Power Plants

Actual investments in power plants will be a function of both the market size and investment climate of each economy. Figure 6 compares economy rankings by market sizes for private power, and by investment climates. Figure 6 is divided into four quadrants to separate larger and smaller markets for power plants, and the more and the less favorable investment climates. Quadrant I (upper left) includes China and India, which have the largest markets for power plants, but less favorable investment climates. Pakistan just misses being included in Quadrant I. Government action to improve the investment environment in Quadrant I countries could have the largest impact on investment levels of the four quadrants, because these two countries are projected to account for over half of the growth in generating capacity over the next two decades.

Quadrant II includes Indonesia and Thailand. These economies have the best combination of both large markets and favorable investment environments. Indonesia has the highest overall combination of market size and investment climate in Asia, followed by Thailand. Potential

investors in countries in Quadrant II should expect vigorous competition for projects. Quadrant III includes Australia, Malaysia, and Taiwan, and has a more favorable investment climate but smaller markets size. South Korea is a contender for Quadrant III.

Figure 6. Ranking of Asian Economies Based on Investment Climates and Market Sizes

Quadrant IV includes the remaining six economies with both less favorable investment climates and smaller markets for power plants. Japan, South Korea, and the Philippines are in Quadrant IV, but have the potential to move to any of the other three quadrants, depending on changes in government policies. One of Asia's most overlooked investment opportunities for the longer term may be Japan. It has Asia's largest power sector and Asia's highest electricity prices; yet private investors are giving limited attention to this market. Japan will need to make its domestic market much more competitive in order to compete with its increasingly market-oriented neighbors in the twenty-first century. Therefore, investors should watch the Japanese market as a potential major market for private power investments in the medium to long term.

Both Japanese and U.S. companies give similar rankings of market sizes for private power with the following exceptions. U.S. companies expect a larger market for private power in Pakistan and Hong Kong, while Japanese companies rank Indonesian and Japanese markets larger than U.S. companies do.

MARKET SIZE FOR SO_x CONTROL TECHNOLOGIES

Figure 7 shows the relative market sizes for SO_x control technologies. Medium and larger markets for SO_x control technologies (≥ 4 GW) are China (largest), followed by India, Japan, and South Korea, with Taiwan and Indonesia marginally below the medium market size ranking.² The two smallest markets (1 - 3 GW) are Vietnam and Hong Kong. Australia is an anomaly with a relatively large coal-fired power sector but a small market for SO_x control technologies owing to a combination of its use of low sulfur coal, flexibility in siting and operating plants, and less stringent environmental codes.

Figure 7. Ranking of Market Sizes for SO_x Control Technologies in Power Plants

Coal, power, and engineering companies gave similar rankings to most economies, with China listed as the largest SO_x market by all three company types. As shown in Table 2, power companies indicated smaller SO_x markets for most economies than did engineering and coal companies.

² Our assessment indicates a minimum of 25 GW of potential SO_x control technologies in both China and India over the next decade, with domestically manufactured SO_x control technologies dominating the market.

Table 2. Market Size of SO_x Control Technologies on Power Plants

	Market Size Rating*			
	Power	Coal	Engr.	Average
China	3.44	3.86	3.80	3.67
India	3.24	3.50	3.43	3.35
Japan	2.78	3.40	3.60	3.27
South Korea	2.83	3.00	3.08	3.04
Indonesia	2.88	3.14	3.07	2.94
Taiwan	2.69	3.00	3.10	2.96
Thailand	2.36	2.60	3.00	2.63
Philippines	2.53	2.60	2.55	2.48
Pakistan	2.60	2.60	2.17	2.41
Australia	2.08	2.00	2.69	2.25
Malaysia	2.33	2.60	2.45	2.29
Hong Kong	2.00	2.25	2.23	2.04
Vietnam	2.00	2.20	2.00	2.00
Sample Size	19	9	16	35

* 1=very small (<1GW), 2=small (1 - 3GW), 3=medium (4 - 10GW), 4=large (>10GW)

Note: Because a number of companies listed more than one business activity (i.e. coal and power), the sample sizes for power, coal, and engineering add up to more than the total sample size of 35. The average cannot be calculated from the numbers for individual business activities.

PREFERRED FUEL MIX FOR POWER PLANTS

Companies with equity interests in power plants were asked to indicate the preferred fuel for power plants in each Asian economy.³ Figure 8 shows that coal is the preferred fuel in 60 percent of the responses, followed by natural gas with 31 percent (22 percent pipeline and 9 percent LNG) and oil (9 percent). For comparative purposes, our projections of the mix of fossil fuels (i.e., excluding the substantial nuclear and hydro capacity) for new capacity additions during the 1994-2000 period are 76 percent coal, 21 percent gas, and 3 percent oil.

³ As previously noted, the survey included a disproportionately high number of companies involved in coal facilities, therefore is not necessarily an objective sample of fuel preferences in the power industry as a whole. In addition, the estimates do not account for the differences in market and plant sizes.

Figure 8. Preferred Fuel for Asian Power Plants

Note: Percentages are based on the number of times companies in the survey indicated each fuel.

Figure 9 shows the percentages of responses for coal-fueled plants in each Asian economy. China leads Asia, with 91 percent of the companies indicating coal as the fuel of choice in Chinese plants, followed by Australia (79 percent) and India (76 percent). Natural gas was the preferred fuel in Malaysia (74 percent) and Thailand (54 percent). The two most important markets for pipeline natural gas were Malaysia (57 percent) and Thailand (50 percent), with Japan the most important LNG market (41 percent).

Figure 9. Percentage of Investors Who Prefer Coal for Power Plants in Each Asian Economy

China, Australia, and India have large coal reserves and limited natural gas reserves near major electricity markets. Therefore, companies have a strong preference for coal-fired power plants. On the other hand, both Malaysia and Thailand have limited coal reserves but access to substantial amounts of natural gas within pipeline distance. Therefore, companies have a greater interest in plants fueled by pipeline natural gas. Japan's island location, strict environmental codes, and higher electricity prices enhance the competitive position of LNG there.

Coal was preferred by 66 percent of the U.S. companies, compared with 54 percent of the Japanese companies. LNG was preferred by 16 percent of the Japanese companies, compared with 5 percent of U.S. companies—probably a reflection of the fact that Japan is Asia's largest LNG market.

INVESTMENT CRITERIA

Companies were asked to indicate the relative importance of ten criteria in selecting countries for investment. Figure 10 shows the ranking of investment criteria. High importance was given to government policies (most important), followed by legislation regulating foreign investment and by government stability. Less important criteria (medium importance) were time required to reach agreements, tax rates, and past experience of investors. One respondent added that secure fuel supplies, electricity pricing structure, and creditworthiness were also important.

Figure 10. Importance of Various Criteria in Selecting Countries for Investment

Japanese and U.S. companies were more generally similar in their ranking of investment criteria. The most significant differences are that U.S. companies place higher importance on the time

required to reach agreements and on corruption, while Japanese companies place greater importance on tax rates. The greater patience of Japanese firms in negotiations may reflect a cultural difference between Asians and Americans that can be important for success in the Asian business environment. Although both U.S. and Japanese companies place medium-to-high importance on corruption issues, this criterion was ranked slightly higher by U.S. companies. Japanese companies indicated that tax rates have greater importance, which is possibly a reflection of the relatively high tax rates in Japan compared with those in most other Asian economies.

PROFIT CRITERIA

Almost all large projects are evaluated using some form of internal rate of return (IRR) method. However, there are four alternative ways of calculating IRRs, and the IRR from one method is not directly comparable with the IRR from another method without knowing the financial structure of a project. The four basic IRR methods are IRR on total project funds in current terms (inflation included), IRR on total project funds in constant terms, and IRR on equity in constant and in current terms.

Figure 11 shows the percentage of the 34 respondents using each of the four IRR methods to evaluate projects. The results are surprising, in that there is no dominant method of calculation among the four options: 29 percent use IRR on equity in current terms (inflation included), 29 percent use IRR on equity in constant terms, 24 percent use IRR on total funds in a project in current terms, and 18 percent use IRR on total funds in constant terms.

Figure 11. Percentage of Company Responses by IRR Methodology (Total 34 Companies)

An attempt was made to convert the IRRs in each of the four options to a common IRR basis, assuming a hypothetical standard project with typical loan/equity ratios, a moderate international inflation rate, and a typical loan period. It was found that investors did not have similar IRRs after conversion to the same base. There are a number of possible reasons why IRRs on one basis did not convert to a similar IRR on another basis, including deviation from the typical project assumptions (equity 25 percent, inflation 5 percent, and interest rate 11 percent), or that companies may actually have different IRRs.

More consistent comparisons result from ranking economies based on the relative IRRs required. As shown in Table 3, the highest IRRs are for China where investors require between 16.6 and 22.5 percent, depending on the method of calculation. At the other end of the scale, investors require the lowest IRRs for Japan, ranging from 13.3 to 17.6 percent, depending on the method of calculation. Owing to the relatively small samples in each category, and the three types of investors included in the survey, the exact IRRs can be misleading. The rankings of relative IRRs appear to be a better measure of relative risk than the specific IRRs. The survey revealed that most investors modify their target profit levels (IRR) to adjust for perceived risks in the various economies.

Table 3. Target IRR on Investments

Economy	IRR on Investment (Percent)				Average Ranking (1=Lowest)
	Equity Current	Equity Constant	Total funds Current	Total funds Constant	
Japan	17.57	13.50	16.00	13.33	1
Australia	18.22	15.57	15.71	14.40	2
Taiwan	19.00	17.75	16.67	14.67	3
Malaysia	19.71	18.50	17.25	15.00	4
South Korea	19.71	17.00	16.67	15.67	5
Philippines	19.89	19.60	17.40	15.00	6
Hong Kong	21.00	17.00	18.33	15.00	7
Thailand	20.13	19.00	17.40	15.33	8
Indonesia	20.70	19.75	18.29	16.25	9
India	21.90	21.17	17.25	15.00	10
Pakistan	21.56	20.50	18.50	15.00	11
Vietnam	22.13	20.00	18.75	15.00	12
China	22.50	20.00	19.17	16.60	13
Sample Size	10	10	8	6	34

IRR AND EUROMONEY RISK RANKINGS

Figure 12 compares the ranking of economies according to the required IRRs from the survey with the ranking of economies according to the most recent *Euromoney* country risk rankings (*Euromoney*, March 1995). The *Euromoney* rankings are measures of country risk based on nine economic and political indicators.⁴ In contrast, the present survey ranks countries according to the relative IRRs, another measure of perceived risks. The *Euromoney* rankings are a better measure of overall country creditworthiness, while the survey results probably provide a better indication of perceived risks to private investors in the power sector, coal mines, and SO₂ control technology. Even though the measurement methods are different, the results correlate reasonably well. The highest risk economies by both measures are China, Vietnam, and Pakistan, while Japan, Australia, and Taiwan have the three lowest risk environments. The main differences are that private investors have a more negative assessment of China and Hong Kong than lending institutions do, whereas lenders rank the Philippines less favorably than private companies do.

Figure 12. Comparison of Investor Target IRR Rankings with Euromoney Country Risk Ratings

⁴ The *Euromoney* country risk table is based on economic performance (25 percent), political risk (25 percent), debt indicators (10 percent), debt that is in default or has been rescheduled (10 percent), credit ratings (10 percent), access to bank finance (5 percent), access to short term finance (5 percent), access to international bond and syndicated loan markets (5 percent), and access to and discount on forfeiting (5 percent).

IRRS VERSUS INVESTMENT CLIMATE RANKINGS

There should be a correlation between the target IRRs of companies and the investment climate of various economies. Figure 13 shows our IRR ranking of economies against our ranking of economies according to investment climates. There is a broad correlation between measures, with the exception of four economies. Japan and Hong Kong have lower target IRRs than might be expected from their investment climate rankings. Thailand and Indonesia have higher target IRRs than might be expected from their high investment climate rankings. Investment climates reflect both clearly measurable risks and other factors, such as government policies, corruption, and the complexity of the investment environment.

Figure 13. Comparison of Investor Target IRR Ranking with Investment Climate Rankings

A plausible explanation of the differences is as follows. Both Japan and Hong Kong have had stable investment environments for long periods and therefore have been able to attract investments at lower IRRs. The lower than expected investment climate rankings are probably due, in the case of Japan, to difficulties in entering the domestic market and, in the case of Hong

Kong, to both the small market and the looming uncertainties when the colony is transferred to Chinese control in 1997.

The better investment climate ranking of Thailand and Indonesia may result from past stability for foreign investment, and high levels of private investment. But Thailand's generally stable investment environment is clouded by uncertainties about potential delays in developing private power projects, and limited opportunities in coal mining. Indonesia has a higher than expected required IRR, which may reflect uncertainties about the political succession after President Suharto (who has headed the government for three decades), the potential for delays with private power projects, and uncertainties surrounding the bidding process.

CONCLUSIONS

This first annual survey of companies involved in coal mine and power plant investments in Asia provides a mid-1995 view of how these industries rank the investment climates in Asian economies. The industry trends are believed to be useful to government policy people and companies with Asia-wide investment interests. However, such industry-wide surveys are not expected to define rapidly developing opportunities that have yet to be widely recognized by industry, such as those in Vietnam, or possible longer term investment opportunities, such as those in Japan.

The two countries with the best combination of a favorable investment climate and a large electricity market are Indonesia and Thailand. These two countries are currently attracting high levels of competition for projects, and investors should anticipate falling profit margins in the longer term.

Among the least favored investment climates is China, which in the long term is expected to be Asia's largest market for power plant and SO_x control technologies. The present unsatisfactory investment conditions in China should not deter companies from positioning themselves in this key Asian market. The strategy for most companies should be to limit their exposure to large investment risks in the short term, but to remain strategically positioned to respond effectively to investment opportunities as China improves its policies and investment terms in the late 1990s.

Industry rates India's investment climate significantly better than China's, but caution is warranted until there is more evidence of commercial success in smoothly developing private power projects.

Appendix 1

1995 ASIA INVESTMENT SURVEY RESPONSES

Company	Headquarters
ABB Power Gen.	Switzerland
AES Corp.	USA
AES Transpower	USA
Ahlstrom Development Corp.	USA
ARCO Coal	USA
Babcock & Wilcox	Canada
Babcock-Hitachi K. K.	Japan
Bechtel Enterprises, Inc.	USA
BHP Power Asia Inc.	Australia
Center for Coal Utilization Japan	Japan
China Light & Power	Hong Kong
Chiyoda Corp.	Japan
Consol Inc.	USA
CRA Limited	Australia
Custom Coals	USA
Cyprus Amax Coal Company	USA
Duke Energy Asia	USA
EBARA Corporation	Japan
Electric Power Development Center (1)	Japan
Electric Power Development Center (2)	Japan
Exxon Coal and Minerals Co.	USA
Foster Wheeler	USA
GE Power Systems	USA
HEI Power	USA
Holmes & Associates	USA
Hopewell Holdings Ltd.	Hong Kong
HRL Technology	Australia
Idemitsu Kosan	Japan
Ishikawajima-Harima Heavy Ind.	Japan
John Brown Eng.	UK
Kansai Elect. Power Co.	Japan
Kawasaki Heavy Industries	Japan
Kilborn Engineering	Canada
L & C Steinmüller	Germany
Mapco Coal Inc.	USA
Mission Energy Co.	USA
Mitsubishi Corp.	Japan

Company	Headquarters
Mitsubishi Heavy Industries Ltd	Japan
Mitsubishi Materials Corp.	Japan
Mitsui & Co.	Japan
Mitsui Eng. & Shipbuilding Co.	Japan
Mitsui Matsushima Co. Ltd.	Japan
Mitsui Mining Company	Japan
Mobil Independent Power Inc.	USA
NRG Energy	USA
P.T. Adaro Indonesia	Indonesia
Pittsburg & Midway Coal	USA
Pure Air	USA
Ralph Parsons	USA
SGI International	USA
Southern Electric International	USA
Stone & Webster	USA
Sumitomo Coal Mining Co.	Japan
Taiheiyo Kouhatsu Inc.	Japan
Total Energy Services Ltd.	France
Zeigler Coal Holding Company	USA