

Expenditure on Infrastructure in East Asia Region, 2006-2010

Tito Yepes

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1. Overview

Developing economies in East Asia will need to spend an estimated total of \$165 billions per annum between 2006-2010² in certain infrastructure sectors, namely electricity, telecommunications, major paved inter-urban roads, rail routes, water and sanitation (compared to an estimated \$147 billion p.a. in 2000-2005).³ This amounts to nearly 6.2% of the GDP for the region, comprising 4.0% for investment and 2.2% for maintenance. Further, China alone is expected to account for 80% of infrastructure expenditures in the region. Among the sectors, electricity in China has the largest share (44%) of total annual expenditure in infrastructure in the region.

These predictions follow the methodology used in Fay and Yepes (2003). Infrastructure stock trends are obtained from a panel data estimation of the eight⁴ East Asian countries for which adequate data were available using lagged dependent variables and controlling for economic growth and economic geographic variables. Projected stocks levels were then valued at “best practice costs” (See Annex A). Investment expenditures are calculated as the increment in stock values over time, while the annual maintenance expenditures are estimated as a fixed percentage⁵ of the stock value. Projections for 12 other countries⁶ were obtained by assuming the same sector expenditure as a % of GDP as for those countries in the same income group within the sample of 8 countries. Estimates for Vietnam assume sector percentages equivalent to

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² Annex B provides numbers for periods 1996-2000 and 2001-2005.

³ That is, the data exclude: urban roads, unpaved roads, secondary tertiary paved roads, mass transit, ports, airports, gas grids, bridges, and waterways. The analysis therefore excludes substantial infrastructure expenditures.

⁴ Countries included in the model are China, Indonesia, Lao PDR, Malaysia, Mongolia, Papua New Guinea, the Philippines, and Thailand, which collectively represent 98% of the total GDP of the 21 developing countries in the East Asia and Pacific region.

⁵ For electricity, roads and railways we use 2%, Water and Sanitation 3%, and Telecommunications 8%.

⁶ Cambodia, Fiji, Kiribati, Marshall Islands, Micronesia, Myanmar, Palau, Samoa, Solomon Islands, Timor Leste, Tonga, and Vanuatu.

those in China. Collectively these 13 countries for which direct data were not available represent only 2% of the GDP of developing countries in the East Asia and Pacific region, so using the indirect estimation method described above does not introduce any possibility of serious bias in the overall results.

Note that the estimates do not capture any absolute measure of "need" such as those developed in the Millennium Development Goals, nor do they estimate what will *actually* be spent. Projections are only what expenditure would be at "best practice" prices, and consistent with projected economic growth rates. The prices used are a mixture of global, regional, and country-specific prices as detailed in Annex A.

Physical stock levels presented in Table 1 show that power generation capacity in China is expected to be 85% higher in 2010 compared to 2000. In China telephone mainlines will increase to three times the existing penetration rate in 2000 and as much as 30 times for mobile phone subscribers. Notice that the penetration rate for mobile phones was already up to 170 lines per 1000 people in 2003 compared to 18 in 2000. Increase in stock for roads and rail route lengths will also be significant with the stock of paved roads predicted to grow by 51% and rail route lengths by 18%. Finally, percentages of households with access to potable water and sanitation will go up from 75% and 40% in 2000 to 82% and 47% in 2010, respectively.

Table 1. Infrastructure Stock in East Asia, 2000-2010

Sector	China			Rest of East Asia		
	2000	2005	2010	2000	2005	2010
Electricity Generation Capacity (GW)	293.7	409.8	545.8	66.5	88.6	115.6
Telephone Mainlines (Lines per 1000 hab)	113	211	353	49	78	123
Telephone Mobile (Lines per 1000 hab)	18	275	561	48	214	400
Paved Roads (Kms per 1000 hab)	229	320	347	724	818	905
Rail Route Length (Kms per 1000 hab)	43	47	51	35	37	39
Access to Improved Water (% Households)	75.0	78.5	82.2	67.9	70.9	74.3
Access to Improved Sanitation (% Households)	40.0	43.4	46.8	66.7	70.6	73.8

Estimates for the 7 countries East Asia other than China, that have been studied in the model predict an increase in power generation capacity only slightly lower than the rate in China. Electricity generation capacity for the region will grow by 73% compared to 2000. With respect to other sectors, telecommunications is estimated to register a penetration rate 2.5 times in telephone mainlines and 8 times in telephone mobile connections with respect to 2000. Stock of paved roads and rail route lengths will increase by almost 25% and 11% respectively while access to improved water and sanitation is predicted to improve by about 9% and 10% respectively.

Projected expenditure needs between 2006-2010 for the East Asia region are approximately US\$ 165 billion annually between 2006 and 2010, Table 2. This amount will be equivalent to 6.2% of the region's GDP. In China alone investment needs are about US\$ 132 billion, which amounts to 6.9% of its GDP. For middle-income countries in the region investment needs will be 3.6% of GDP, and 6.3% in the low income countries (including Vietnam).

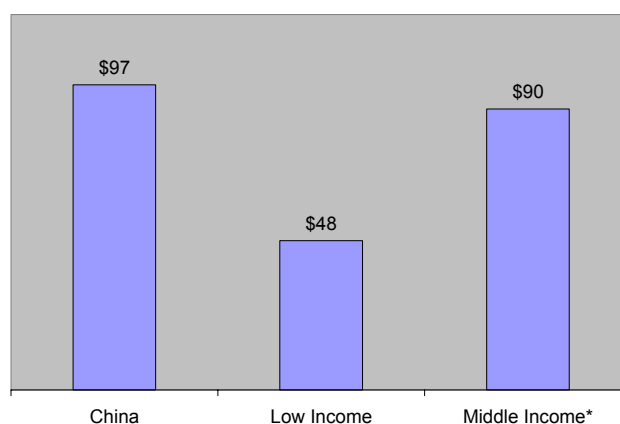
Table 2. Expected Annual Expenditure Needs in US\$ MN, 2005-2010

<i>Countries</i>	US\$ MN			% of GDP		
	Investment	Maintenance	Total	Investment	Maintenance	Total
China	87,637	44,387	132,025	4.6%	2.3%	6.9%
Low Income	10,293	6,550	16,843	3.8%	2.4%	6.3%
Middle Income*	9,118	7,062	16,180	2.0%	1.6%	3.6%
Total	107,048	57,999	165,048	4.0%	2.2%	6.2%

* without China

Expenditures per person p.a. are expected to be \$97 in China and a slightly lower figure for other middle-income countries. Expenditures per capita in low-income countries are projected to be \$48 per year(see Graph 1).

Graph 1. Annual Expenditure per Capita 2005-2010



2. Methodology by Sector

2.1 Electricity

Estimates for electricity include power generation capacity and associated networks for transmission and distribution. Model 1 in Table 4 is used to project kilowatts of generation capacity per capita based on a quinquennial dataset covering 1960-2000. Physical stock is then valued at \$1000 per kilowatt of plant generation capacity plus \$900 for the associated transmission and distribution networks (based on IEA (2003) which estimates that investment in generation in developing countries will account for about half of the total investments in the sector.)

Generation capacity is a supply indicator and our estimations work with the assumption that governments provide it based on planned demand to avoid recurrent outages. Capacity will increase 5.4% per year in an average of countries included in the model. Maintenance is calculated as 2% of the value of all sector endowments, implying an average stock life of 35 years.

Table 4. Fixed Effects Panel Data, Double Log

	1 Electricity Generation Capacity (GW)	2 Telephone Mainlines (Lines per 1000 hab)	3 Rail Route Length (Kms)	4 Paved Roads (Kms)
Lagged Depended Variab	0.503 (4.93)***		0.284 (2.64)**	0.009 -0.06
GDP per Capita	0.44 (2.75)***	1.511 (9.02)***	0.202 (1.81)*	1.293 (2.07)**
Population Density	0.572 -0.6	0.947 (1.94)*	-1.195 (1.71)*	2.954 -0.87
Urbanization Rate	1.33 (3.55)***	0.907 (2.01)*	-0.122 -0.55	2.097 -1.07
Year	-0.028 -1.06		0.005 -0.29	-0.109 -1.12
Constant	56.111 -1.02	-3.254 (2.21)**	-16.732 -0.45	214.765 -1.07
Observations	62	58	49	52
R-squared	0.96	0.96	0.97	0.85

Absolute value of t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Fixed affects are at the country level.

For China, projections were checked against ongoing government projects to enhance capacity that are expected to be complete by 2005. While the latest plan of the National Development and Reform Commission of China projects generation capacity to be 430 GW, the model used here predicts that the country would have a capacity of 410GW. Our estimates show that China will need to invest \$72bn/year compared to US\$ 65 billion projected by IEA (2003).

2.2. Telecommunications

Estimates of infrastructure investment needed in East Asia are also strongly driven by demand from the telecom sector. This is expected to be the result of a rapidly expanding mobile market, which is already the biggest in the world. In China penetration rate for mobile phones is already up to 170 lines per 1000 people in 2003 compared to 18 in 2000. For the region as a whole, there were approximately 230 million mobile phone users in 2003, and market analysts estimate the market to be growing at 4 million per month. Further, unmet demand for landlines remains quite high in East Asia. The waiting period for telephone connections is more than 10 years in the Philippines, and about 2.6 years in Indonesia in 1993. Together these two factors, i.e. growth in cellular phone usage and existing unmet demand, will contribute to a significant demand for investment.

Unit costs for telecommunications are particularly difficult to project given the high rate of technological progress in the sector. The cost projections in Annex A are taken from Pyramid (20004) and World Bank sector specialists, but are subject to a considerable margin of error.

Mainlines per capita were obtained using model 2 in table 5 below. Mobile lines projections have two parts. First models in table 5 using annual data allow projection of both mainlines and the joint main plus mobile lines indicator per 1000 habitants. Second, mobile future penetration is obtained as the difference in annual projections between total lines and mainlines alone.

Maintenance costs are estimated as 8% of the stock value. Ure (2004) in his chapter for Telecomm within this flagship discussed the heavy weight of sunk costs for

the telecom industry. Consistently, maintenance has to be considered since transition among different equipments or technologies takes time and expenditures.

Table 5. Annual Fixed Effects Panel Data, Double Log

	Telephone Mainlines (per 1000 hab)	Telephone Main + Mobile Lines (per 1000 hab)
GDP per Capita	2.10 (19.04)***	2.10 (14.32)***
Population Density	2.20 (6.51)***	3.20 (6.98)***
Urbanization Rate	-0.40 (1.20)	-0.30 (0.60)
Constant	8.50 (21.65)***	11.00 (20.55)***
Observations	237.00	237.00
R-squared	0.90	0.90

Absolute value of t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

2.3. Roads and Rails

Estimations for the stock of roads (and the investment required to both maintain and add to the stock) refer to the paved networks, taking into consideration expressways, first and second-class roads. These results do not include urban and county networks, and unpaved roads. Paved roads were divided into land area to capture country size differentials (the same has been done for all other sectors by dividing the stock by population). Roads as well as rails used quinquennial data. Models for the two sectors are presented in columns 3 and 4 in Table 4.

Unit cost for roads is the average of paving type interventions available for the region in the ROCKS database. The Chinese under construction National Trunk Highway System, to be completed in 2007, was accounted for at implicit unit cost of \$150 billions for 35.000kms. The figures assume the level of highways in China to continue growing at the same rate after 2007.

Other transportation sub sectors were not included due to lack of historical information. Data on waterways including any ocean or inter-island shipping routes, ports or airport are barely available for this period and not likely to depend on the determinants that we use to project infrastructure stocks.

According to projections, annual investment in paved roads is expected to be 0.88% of GDP or US\$ 34 million for the East Asian region for the period 2006-2010. China alone will account for nearly 78% of this amount with an estimated investment demand of US\$ 27 million. Stock of rail routes in the region is expected to reach 90 kms per 1000 people in 2010. This will need almost US\$ 2.8 billion in investment or 0.10% of GDP for the region.

2.4. Water and Sanitation

Lack of historical and consistent information across countries is one the main hurdles in water and sanitation analysis, due to considerable heterogeneity in supply mechanisms across countries. Even the definition of what is acceptable access to water or sanitation is fraught with differences. This report uses definitions currently used in the World Development Indicators. The definitions are:

- Access to an improved water source refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source, such as a household connection, public standpipe, borehole, protected well or spring, and rainwater collection. Unimproved sources include vendors, tanker trucks, and unprotected wells and springs. Reasonable access is defined as the availability of at least 20 liters a person a day from a source within one kilometer of the dwelling.
- Access to improved sanitation facilities refers to the percentage of the population with at least adequate excreta disposal facilities (private or shared, but not public) that can effectively prevent human, animal, and insect contact with excreta. Improved facilities range from simple but protected pit latrines to flush toilets with a sewerage connection. To be effective, facilities must be correctly constructed and properly maintained.

Comparable data for access water and sanitation are only available for 1990 and 2000. We estimate a random coefficients panel data model for those two years using 139 middle and low-income countries across the world. Models are presented in the table 6.

Table 6. Random Effects Panel Data, Double Log

	Access to Improved Water	Access to Improved Sanitation
GDP per Capita	0.094 (3.86) ^{***}	0.161 (3.96) ^{***}
Population Density	0.071 (4.40) ^{***}	0.075 (2.61) ^{**}
Urbanization Rate	0.172 (3.70) ^{***}	0.320 (4.39) ^{***}
Population Growth	-0.061 (3.63) ^{***}	-0.049 (2.03) ^{**}
Constant	2.834 (12.69) ^{***}	1.646 (5.21) ^{***}
Countries	120	116
R-squared	0.451	0.355

Absolute value of z statistics in parentheses

** significant at 5%; *** significant at 1%

Multiplying projected access rates by projected number of households yields estimates for stock of connections available for each period in time. The estimated stock has then been valued at best practice unit cost to yield sector stocks values that provides the basis to calculate the variation (investment need) and depreciation (maintenance need). An estimated 3% of the physical stock value is used for maintenance with an implied 23-year lifetime for both water and sanitation.

3. Conclusions

Estimated expenditure needs of US\$165 billion for the East Asia and Pacific region can be further divided into US\$ 107 billion for net new investments with the remaining US\$ 58 billion for maintenance of existing infrastructure. Among the sectors electricity, telecommunications and roads will demand the largest portions of the investment pie at 3.4%, 0.9%, and 1.3% of GDP respectively. Finally rail routes will need an estimated 0.1% of GDP while water and sanitation will demand 0.3% each (See Table 7).

Table 7. Investments and Maintenance in East Asia

<i>All Countries</i>	US\$ MN			% of GDP		
	Investment	Maintenance	Total	Investment	Maintenance	Total
Electricity	63,446	25,744	89,190	2.4%	1.0%	3.4%
Telecom	13,800	10,371	24,171	0.5%	0.4%	0.9%
Roads	23,175	10,926	34,102	0.9%	0.4%	1.3%
Rails	1,170	1,598	2,768	0.0%	0.1%	0.1%
Water	2,571	5,228	7,799	0.1%	0.2%	0.3%
Sanitation	2,887	4,131	7,017	0.1%	0.2%	0.3%
Total	107,048	57,999	165,048	4.0%	2.2%	6.2%

3.1. Investment in China

Projections for China show that the country would need to spend US\$ 132 billion annually in infrastructure between 2006-2010. This equates to 6.9% of the country's GDP for those years (See Table 8).

Table 8 Investments and Maintenance in China

<i>China</i>	US\$ MN			% of GDP		
	Investment	Maintenance	Total	Investment	Maintenance	Total
Electricity	51,668	20,739	72,407	2.7%	1.1%	3.8%
Telecom	11,735	8,232	19,967	0.6%	0.4%	1.0%
Roads	19,345	7,424	26,769	1.0%	0.4%	1.4%
Rails	963	1,258	2,221	0.1%	0.1%	0.1%
Water	2,097	4,090	6,187	0.1%	0.2%	0.3%
Sanitation	1,830	2,644	4,474	0.1%	0.1%	0.2%
Total	87,637	44,387	132,025	4.6%	2.3%	6.9%

In China, electricity, telecommunications, and roads, will need expenditure levels of approximately 3.8%, 1.0%, and 1.4% of GDP respectively. Needs from the water and sanitation sectors are an estimated 0.3% and 0.2% of GDP respectively.

3.2. Other EAP countries

Table 9 Investments and Maintenance in Rest of East Asia

<i>All without China</i>	US\$ MN			% of GDP		
	Investment	Maintenance	Total	Investment	Maintenance	Total
Electricity	11,778	5,005	16,783	1.6%	0.7%	2.3%
Telecom	2,065	2,139	4,204	0.3%	0.3%	0.6%
Roads	3,830	3,503	7,333	0.5%	0.5%	1.0%
Rails	207	341	547	0.0%	0.0%	0.1%
Water	474	1,138	1,612	0.1%	0.2%	0.2%
Sanitation	1,057	1,486	2,544	0.1%	0.2%	0.3%
<i>Total</i>	19,411	13,612	33,023	2.6%	1.8%	4.5%

Estimates for countries in rest of East Asia i.e. excluding China, show those economies will need US\$ 33 billion, which will be about 4.5% of their GDP (See table 9), of which US\$ 19 billion or about 2.6% of GDP will be for investments. Electricity will lead the sectors with an expected demand of 2.3% of GDP, telecomm 0.6%, roads and rails 1.0% and 0.1% respectively while water and sanitation will demand an additional 0.2% and 0.3% of GDP respectively.

Table 10 Investments and Maintenance in the Rest of East Asia, Middle Income Countries

<i>Middle Income without China</i>	US\$ MN			% of GDP		
	Investment	Maintenance	Total	Investment	Maintenance	Total
Electricity	6,408	2,897	9,305	1.4%	0.6%	2.1%
Telecom	1,167	1,412	2,579	0.3%	0.3%	0.6%
Roads	828	1,453	2,282	0.2%	0.3%	0.5%
Rails	138	155	294	0.0%	0.0%	0.1%
Water	160	413	573	0.0%	0.1%	0.1%
Sanitation	417	731	1,148	0.1%	0.2%	0.3%
<i>Total</i>	9,118	7,062	16,180	2.0%	1.6%	3.6%

This report also tabulates investment needs for the East Asia and Pacific region based on income level of countries. Countries have been grouped under two categories –

middle-income⁷, (see estimates provided in Table 10 excluding China) and low-income countries⁸ (see estimates in Table 11).

Note, the low-income group is estimated to have a higher investment need at 6.3% of GDP compared to 3.6% for the middle-income group (excluding China). Maintenance needs will also be correspondingly higher. A big contributor to this difference is the need for higher investment in roads for the low-income group. These countries will need 1.7% of GDP invested in roads while the middle-income nations will need only 0.5%.

Table 11 Investments and Maintenance in the Rest of East Asia, Low Income Countries

<i>Low Income</i>	US\$ MN			% of GDP		
	Investment	Maintenance	Total	Investment	Maintenance	Total
Electricity	5,370	2,107	7,478	1.8%	0.7%	2.6%
Telecom	898	728	1,626	0.6%	0.4%	1.0%
Roads	3,002	2,049	5,051	1.0%	0.7%	1.7%
Rails	68	185	254	0.0%	0.1%	0.1%
Water	314	725	1,039	0.1%	0.2%	0.4%
Sanitation	640	755	1,395	0.2%	0.3%	0.5%
Total	10,293	6,550	16,843	3.8%	2.4%	6.3%

⁷ China, Fiji, Kiribati, Malaysia, Marshall Islands, Micronesia, Palau, the Philippines, Samoa, Thailand, Tonga and Vanuatu.

⁸ Cambodia, Indonesia, Lao PDR, Mongolia, Myanmar, Solomon Islands, Timor Leste and Vietnam.

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Annex A
Best Practice Unit Cost

Sector	Unit	2000	2005	2010	Maintenance, % of stock value
		US\$			
Electricity	per kilowatt of generating capacity, including associated network cost.	1,900	1,900	1,900	2%
Roads	per kilometer of two lane paved road	417,995	417,995	417,995	2%
Railway	per kilometer of rail, including associated rolling stock	900,000	900,000	900,000	2%
Sanitation	per connected household	700	700	700	3%
Water	per connected household	400	400	400	3%
Mainlines, China	per line	451	210	96	8%
Mobile, China	per subscriber	210	80	96	8%
Mainlines, Rest	per line	451	280	127	8%
Mobile, Rest	per subscriber	280	185	127	8%

SOURCES

Mobile Based on Pyramid (2003) and Pyramid(2004)

Mainlines Based on CAPEX database from International Telecommunications Union and Pyramid (2004)

Water and Sanitation Fay and Yepes (2003). The aggregate unit costs are being used in the WDR. \$140/cap sanitation and \$80/cap water supply. These were constructed differentiating urban-peri urban-rural and low tech/service level (eg. standpipes, latrines, etc).

Power Based on Fay(2001), include generation, transmission, and distribution. Usually generation being 50% of the total as presented in IEA (2003).

Roads Based on 69 projects of Road Costs Knowledge System -ROCKS- for EAP region. The World Bank

Rails Fay and Yepes (2003).

Please note where the data are country-specific

Annex B
Expected Annual Expenditure Needs

<i>All Countries</i>	Investment			Maintenance		
	1996-2000	2001-2005	2006-2010	1996-2000	2001-2005	2006-2010
Electricity	41,833	53,898	63,446	14,055	19,423	25,744
Telecom	15,458	13,473	13,800	6,841	8,156	10,371
Roads	16,033	26,533	23,175	6,309	8,916	10,926
Rails	1,206	1,270	1,170	1,368	1,484	1,598
Water	4,816	2,466	2,571	4,485	4,848	5,228
Sanitation	7,024	2,857	2,887	3,277	3,701	4,131
Total	86,370	100,496	107,048	36,334	46,529	57,999

<i>China</i>	Investment			Maintenance		
	1996-2000	2001-2005	2006-2010	1996-2000	2001-2005	2006-2010
Electricity	34,035	44,132	51,668	11,159	15,573	20,739
Telecom	13,377	10,174	11,735	5,770	6,322	8,232
Roads	13,764	22,105	19,345	3,555	5,765	7,424
Rails	803	980	963	1,063	1,161	1,258
Water	3,333	2,013	2,097	3,474	3,776	4,090
Sanitation	4,831	1,771	1,830	2,104	2,370	2,644
Total	70,143	81,175	87,637	27,126	34,966	44,387

<i>All without China</i>	Investment			Maintenance		
	1996-2000	2001-2005	2006-2010	1996-2000	2001-2005	2006-2010
Electricity	7,798	9,765	11,778	2,896	3,850	5,005
Telecom	2,081	3,299	2,065	1,070	1,835	2,139
Roads	2,269	4,427	3,830	2,754	3,150	3,503
Rails	402	290	207	305	323	341
Water	1,483	454	474	1,012	1,073	1,138
Sanitation	2,193	1,086	1,057	1,172	1,331	1,486
Total	16,227	19,321	19,411	9,208	11,562	13,612

<i>Middle Income without China</i>	Investment			Maintenance		
	1996-2000	2001-2005	2006-2010	1996-2000	2001-2005	2006-2010
Electricity	4,897	5,648	6,408	1,692	2,257	2,897
Telecom	1,161	2,218	1,167	632	1,187	1,412
Roads	1,849	1,573	828	1,266	1,386	1,453
Rails	371	262	138	121	142	155
Water	554	169	160	364	389	413
Sanitation	1,097	510	417	592	669	731
Total	9,930	10,380	9,118	4,668	6,030	7,062

<i>Low Income</i>	Investment			Maintenance		
	1996-2000	2001-2005	2006-2010	1996-2000	2001-2005	2006-2010
Electricity	2,901	4,118	5,370	1,204	1,594	2,107
Telecom	920	1,081	898	438	648	728
Roads	420	2,854	3,002	1,487	1,765	2,049
Rails	32	27	68	184	180	185
Water	929	285	314	648	684	725
Sanitation	1,096	577	640	580	662	755
Total	6,298	8,942	10,293	4,541	5,532	6,550

Annex C
Basic Data

Country	Year	Electricity Generation Capacity	Telephone Mainlines	Paved Road Length	Rail Route Length
		<i>GW</i>	<i>Lines</i>	<i>Kms</i>	<i>Kms</i>
China	1960				33900
Indonesia	1960	391	75197	13583	6640
Korea	1960	439		724	2977
Laos	1960	7	736	121	
Malaysia	1960	336	47212	8932	2100
Mongolia	1960	61			
PNG	1960	16			0
Philippines	1960	765		6350	1020
Singapore	1960	152	37035		0
Thailand	1960	191	36949	2736	3554
China	1965				36400
Indonesia	1965	810	115072	20877	6640
Korea	1965	947	219681	1558	2980
Laos	1965	13	1000	121	
Malaysia	1965	502	78867	12393	2126
Mongolia	1965	185			
PNG	1965	25	4081		0
Philippines	1965	1085	78920	9716	1031
Singapore	1965	344	58308	866	0
Thailand	1965	559	52090	5211	3598
China	1970				41000
Indonesia	1970	907	129291	21073	6640
Korea	1970	2764	478845	3622	3192
Laos	1970	21	1100	784	
Malaysia	1970	866	103104	14803	2160
Mongolia	1970	219			
PNG	1970	64	10415	212	0
Philippines	1970	2176	171799	13502	1052
Singapore	1970	644	106447	1364	0
Thailand	1970	1336	92937	9971	3765
China	1975	35000	1692000	92000	46000
Indonesia	1975	1259	198884	33051	6637
Korea	1975	5135	1151925	10014	3144
Laos	1975	55	5400	622	
Malaysia	1975	1227	178354	16578	2079
Mongolia	1975	266			
PNG	1975	255	17329	517	0
Philippines	1975	3231	283649	18538	1060
Singapore	1975	1150	236936	1722	0
Thailand	1975	2754	233678	17716	3765
China	1980	67000	2141000	158000	49940
Indonesia	1980	4876	337389	56519	6637
Korea	1980	7923	2545730	15588	3135

**Annex C
Basic Data**

Country	Year	Electricity Generation Capacity	Telephone Mainlines	Paved Road Length	Rail Route Length
		<i>GW</i>	<i>Lines</i>	<i>Kms</i>	<i>Kms</i>
Laos	1980	172	5500		
Malaysia	1980	3046	371601	19008	2084
Mongolia	1980	430			1697
PNG	1980	313	23762	820	0
Philippines	1980	4478	404695	21280	1059
Singapore	1980	2010	502474	2048	0
Thailand	1980	3849	359729	23613	3735
China	1985	82200	3120000		52119
Indonesia	1985	7850	570626	83570	6701
Korea	1985	14741	6142323	26027	3121
Laos	1985	225	5961		
Malaysia	1985	4028	899468	24647	2084
Mongolia	1985	758	49000	9000	1748
PNG	1985	491	29614	900	0
Philippines	1985	6204	509771	21320	897
Singapore	1985	2691	778802	2507	0
Thailand	1985	7395	623981	31244	3735
China	1990	137891	6850300	207000	53378
Indonesia	1990	12733	1011467	136451	6370
Korea	1990	19997	12515605	42448	3091
Laos	1990	225	6910	3353	
Malaysia	1990	4967	1555807	62984	2222
Mongolia	1990	901	66357	9000	1920
PNG	1990	490	34029	595	0
Philippines	1990	6818	610400	321	377
Singapore	1990	3380	1048168	2758	0
Thailand	1990	8317	1292584	44730	3861
China	1995	204100	40700000		54616
Indonesia	1995	15958	2943586	175599	
Korea	1995	27750	18111612	57710	3101
Laos	1995	256	17142	2556	
Malaysia	1995	9000	3167736	58134	
Mongolia	1995	901	78402	1625	1920
PNG	1995	490	47460	652	0
Philippines	1995	9239	1291645	20489	
Singapore	1995	4553	1430234	2871	0
Thailand	1995	13035	3217689	58078	
China	2000	293667	144000000	314204	59079
Indonesia	2000	20592	5897048	159313	6458
Korea	2000	49988	21013738	64162	3125
Laos	2000	425	42910		
Malaysia	2000	12932	4644110	49321	1670
Mongolia	2000	901	116890	1724	1810
PNG	2000	554	65664	686	0
Philippines	2000	12341	2673642	37449	897
Singapore	2000	6730	1885547	2986	38
Thailand	2000	18741	5252972	62985	4071