中國 에너지 統計

금년도 韓·中 양국의 貿易代表部 개설을 계기로 멀지 않은 장래에 外交關係도
수립되면서 제반교류 투자환경이 개선 될 것으로 보이는 中國의 에너지 統計資料
(WEC 國家別에너지 통계집,1989)를 입수하여 全文을 게재한 것이다.

GENERAL FEATURES OF THE ENERGY ECONOMY

The area of China covers 9600000 km², with a total population of 1096 million inhabitants at the end of 1988. China is a country with the largest population in the world

China has relatively abundant energy resources. The Chinese government has paid much attention to the exploitation and utilization of energy resources ail along. In 1987, the total production of primary energy in China was 913 million tons of coal equivalent, and the total domestic consumption of energy was 859 million tons of coal equivalent, seventeen times and sixteen times as much as that in 1953 respectively. the average annual growth rate during the 34 years was 10.42% and 9.29% respectively. In the same period, the average annual growth rate of gross social output (it is the summation of output of industry, agriculture, construction, transport and commerce) in China was 8.6%, and of national income was 6.8%, that is to say, energy development was faster than the economy. In 1987, China's gross social output was 2308 billion Yuan (US$ 619 billion), and the national income was 923 billion Yuan (US$ 250 billion), corresponding to US$ 231 and 862 per capita respectively.

Characteristics of China's energy production and consumption in recent years are as follows:

1. Coal is the major source in the energy structure by sources. Coal account for more than 75% of the total energy consumption.

2. Industrial sectors are the major consumers of energy in the gross energy consumption structure. The total energy consumption of all industrial sectors including energy industries accounts for 60-65% of the total energy consumption.

3. In the cities the major energy source is also coal, which is burned directly for daily life. Coal accounts for more the 80% of the total urban energy consumption.

4. In the rural areas, the major energy source is biomass energy. The amount of biomass energy consumed including stems from crops, firewood and weeds is more than 250 million tons of coal equivalent per year which accounts for about 70% of the total rural energy consumption.

5. The energy consumption per physical unit of output is relatively high.

6. The energy consumption per capita is relatively low. In 1987, it was only 795 kilograms of coal equivalent.

Now, china is one of the energy export countries in the world,but the amount of energy exported is quite limited which accounts for about 5% of the total energy production. In 1987, crude oil exported was 27.23 million tons, the oil products exported was 5.72 million tons and coal export was 13.51 million tons. The value of energy exported accounts for about 15% of total export in recent years.

The position of electric energy in China becomes more and more important in the energy structure of supply and demand. During the 38 years from 1949--1987 the average annual growth rate of electric generation in the whole country was 13.3% which exceeded that of total production of primary energy (10.1%). In 1987, the total electric generation was 497TWh, which ranked the fourth in the world. In recent years. the sources of electricity production in China are approximatly: the power from coal-burned 70%, the power from oil burned 10% and the hydropower 20%.

The construction of modernization in China demands a huge amount of energy. Strategic target of energy development in China is that under the premises of ensuring to achieve the strategic target of economic development with consuming as less energy as possible, to obtain as more economic benefit and social benefit as possible. Since the Chinese government determined the energy policy of "pay attentions both to the development and conservation and give priority to energy conservation in recent years" in 1980, the scientific management or energy usage has been strengthened, the new technology for energy conservation has been spread, with the result that the effects of energy conservation has been remarkable. During the five years from 1984 to 1987, the energy consumption per 100 million Yuan of national incomes had been decreased from 104 thousand tons of coal equivalent to 99 thousand tons of coal equivalent. The average annual drop rate was 1.6%.
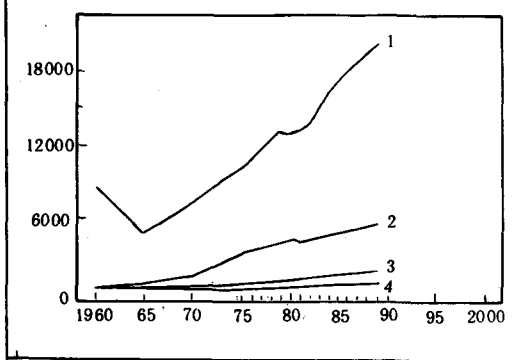
3.1 PRIMARY ENERGY SUPPLY BY SOUREC (PJ)

18000
12000
6000
0
1960 65 70 75 80 85 90 95 2000
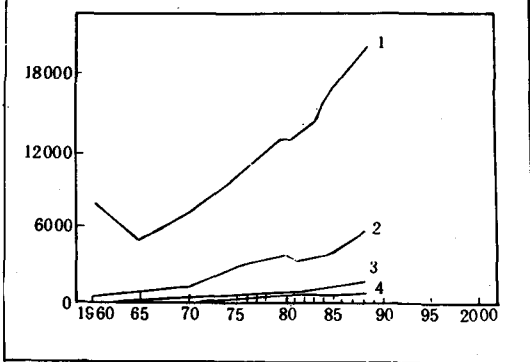
1. Coal 3. Hydropower
2. Crude Oil 4. Natural Gas

3.2 PRIMARY ENERGY ECONOMIC ACTIVITY AND ELECTRICITY (1960=100)

1000
800
600
400
200
0
1960 65 70 75 80 85 90 95 2000
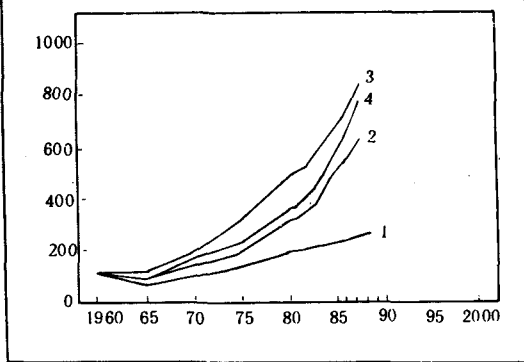
1. Primary Energy Supply 3. Output Valuc of Industry
2. Gross Social Output 4. Electricity

3.3 INDIGENOUS ENERGY PRODUCTION (PJ)

18000
12000
6000
0
1960 65 70 75 80 85 90 95 2000

1. Coal 3. Hydropower
2. Crude Oil 4. Natural Gas

3.4 CONVENTIONAL ENERGY RESOURCES (EJ)

	Hard Coal	Lignite
Resources	35564	6276

crude oil and natural gas

of which:
Proved
Reserves

na

12774 2646
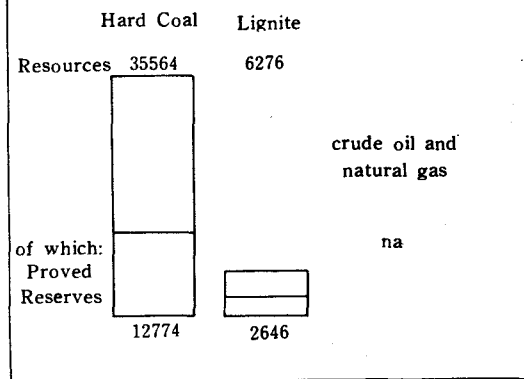
Source: WEC,Survey of Energy Resources, 1986

3.5 ELECTRICITY SUPPLY BY SOURCE (TWh)

300
200
100
0
1960 65 70 75 80 85 90 95 2000
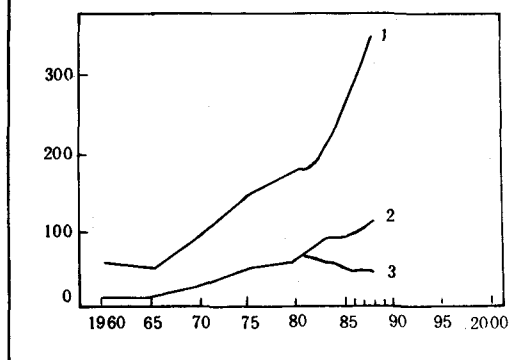
1 Coal 2 Hydropower 3 Oil

3.6 ELECTRICITY CONSUMPTION BY SECTOR (PERCENT)

Transport *
Agricult
Industri

	1970	75	80	84	85	86	87
Transport	1	1	1	1	2	2	2
	6	6	9	10	10	11	11
Agricult	10	13	12	11	12	8	8
Industri	83	80	78	78	76	79	79
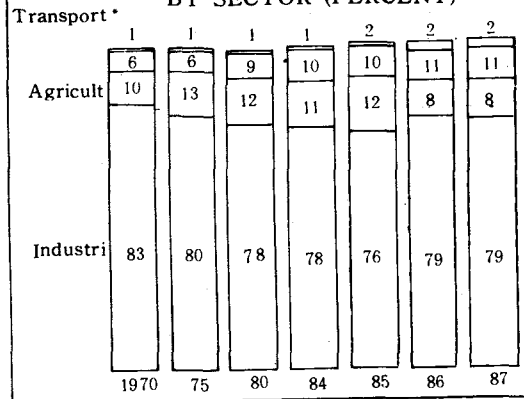
* Residential and Public Service

4.1 GENERAL ENERGY DATA		1970	1980	1981	1982	1983	1984	1985	1986	1987	1988[1]
Population	10^6	830	987	1001	1015	1025	1035	1050	1065	1081	1096
GSO[2]	10^9 US$ (1980)	247	523	547	599	662	752	1017	1168	1414	1750
GSO	10^9 Yuan (1980)	403	853	892	977	1078	1226	1659	1907	2308	2856
GSO Capita	US$ (1980)	298	830	546	590	644	727	968	1097	1308	1597
GSO Capita	Yuan (1980)	486	864	891	963	1052	1135	1580	1791	2135	2606
Primary Energy Supply											
Total	PJ	8582	17661	17418	18355	19350	20775	22567	23928	25181	
Total	Mtoe	204	421	415	437	461	495	537	570	600	
Per Capita	GJ	10	18	17	18	19	20	22	23	23	
Per GSO	MJ/US$ (1980)	35	34	32	31	29	28	22	21	18	
Per GSO	MJ/Yuan (1980)	21	21	20	19	18	17	14	13	11	
Electricity Supply											
Total	TWh	116	301	309	328	351	377	411	450	497	543
Per Capita	KWh	140	305	309	323	343	364	391	423	460	495
Per GSO	Wh/US$ (1980)	470	576	565	548	532	501	404	385	351	310
Per GSO	Wh/Yuan (1980)	288	353	346	336	326	308	248	236	215	190

4.2 PRIMARY ENERGY SUPPLY (PJ)	1970	1980	1981	1982	1983	1984	1985	1986	1987	1988
Indigenous Production										
Coal	7409	12960	13005	13931	14952	16516	18247	18694	19414	20302
Crude Oil	1280	4445	4242	4285	4448	4790	5239	5474	5616	5735
Natural Gas	109	560	500	470	480	479	501	542	535	541
Hydropower	282	710	778	881	1002	1027	1078	1110	1177	1286
Total Production	9080	18675	18525	19567	20882	22814	25065	25820	26742	27864
(Mtoe)	216	445	441	466	497	543	597	615	637	663
Exports (—)										
Coke	8	8	6	11	9	10	11	13	17	
Coal	17	132	137	135	137	146	163	143	208	
Crude Oil	8	558	576	637	636	934	1256	1192	1139	
Oil Products	8	176	192	220	215	244	261	335	333	
Total Exports	71	874	911	1003	997	1334	1691	1683	1697	
(Mtoe)	2	21	22	24	24	32	40	40	40	
Total primary										
Energy Supply	8582	17661	17418	18148	19235	20724	22567	23928	25181	
(Mtoe)	204	421	415	432	458	493	537	570	00	

4.3 TRANSFORMATION SECTOR	1970	1980	1981	1982	1983	1984	1985	1986	1987	1988
					na					

4.4 FINAL ENERGY DEMAND	1970	1980	1981	1982	1983	1984	1985	1986	1987	1988
					na					

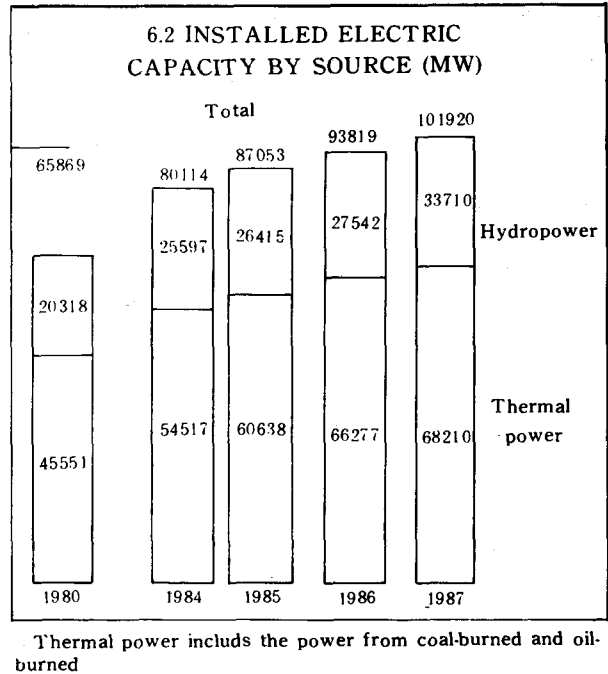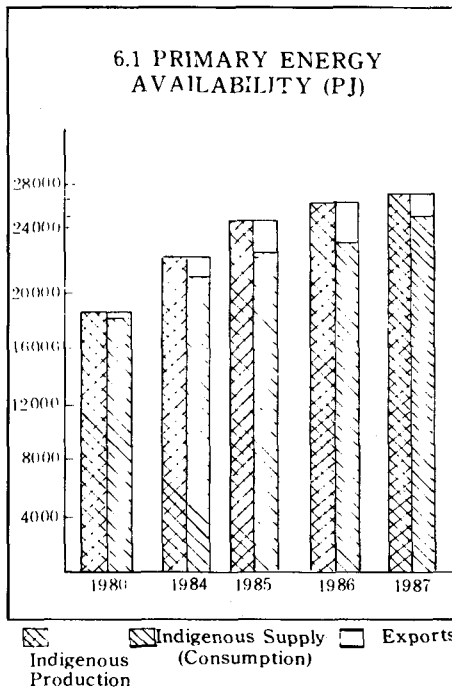1). The data in 1988 is preliminary statistics.
2). GSO=Gross Social Output.

5.1 FINAL ENERGY DEMAND BY SOURCE AND SECTOR (PJ)	1970	1980	1981	1982	1983	1984	1985	1986	1987	1988
Solid Fuels										
Products										
Refined Petroleum					na					
Gas										
Electricity										
Industrial	303	780	795	843	907	974	1037	1194	1312	
Transport	2	10	11	11	18	15	23	24	28	
Agriculture	38	119	125	135	138	140	150	116	129	
Service and other Residential,										
Public	22	86	92	97	110	125	163	169	196	
Total Electricity	365	995	1023	1086	1068	1254	1373	1503	1665	
(Mtoe)	9	24	24	26	28	30	33	36	40	
(PJ Primary Energy)	949	2587	2660	2824	3037	3260	3570	3908	4329	
Demand					na					
Total Final Energy										

5.2 ELECTRICITY SUPPLY BY SOURCE (TWh)	1970	1980	1981	1982	1983	1984	1985	1986	1987	1988
Solid Fuels	95	179	182	193	208	235	266	300	340	367
Oil		64	62	60	57	55	53	56	56	55
Hydropower	21	58	65	75	86	87	92	94	100	106
Total	116	301	309	328	351	377	411	450	497	528

5.3 SECTOR OIL SUBSTITUTION INDICATORS (OAR,OUR)	1970	1980	1981	1982	1983	1984	1985	1986	1987	1988
Oil Application Ratio (OAR) 2)	..									
Industrial		0.34	0.32	0.32	0.30	0.28	0.28	0.30	0.29	
Transport		0.10	0.10	0.11	0.12	0.12	0.12	0.14	0.14	
Agriculture, Commercial,										
Residential and Public Service		0.11	0.11	0.10	0.10	0.11	0.10	0.09	0.10	
Electricity Generation		0.23	0.23	0.22	0.21	0.20	0.18	0.14	0.13	
Oil Use Ratio (OUR) 3)										
Industrial		0.13	0.11	0.11	0.10	0.09	0.08	0.08	0.08	
Transport		0.40	0.44	0.45	0.47	0.45	0.45	0.50	0.51	
Agriculture, Commercial,										
Residential and Public service		0.10	0.09	0.09	0.08	0.07	0.06	0.09	0.10	
Electricity Generation		0.26	0.26	0.20	0.22	0.19	0.18	0.14	0.12	

1) The data before 1980 included the power from oil-burned.

2) $OAR = \dfrac{\text{Oil Consumption in Sector}}{\text{Total Oil Consumption in country}}$

3) $OUR = \dfrac{\text{Oil Consumption in Sector}}{\text{Total Energy Consumption in country}}$

6.1 PRIMARY ENERGY AVAILABILITY (PJ)

28000
24000
20000
16000
12000
8000
4000

1980 1984 1985 1986 1987

Indigenous Production Indigenous Supply (Consumption) Exports

6.2 INSTALLED ELECTRIC CAPACITY BY SOURCE (MW)

Total

	1980	1984	1985	1986	1987
Total	65869	80114	87053	93819	101920
Hydropower	20318	25597	26415	27542	33710
Thermal power	45551	54517	60638	66277	68210

Thermal power includs the power from coal-burned and oil-burned

6.3 EXPLANATIONS AND DEFINITIONS

SYMBOLS AND ABBREVIATIONS EMPLOYED:

e = estimated data

na = not available data

— = magnitude zero

r = revised data in respect of previous issue

In rounding data, each figure has been rounded off to the nearest final digit. The sum of the parts may not therefore equal the total.

CONVERSION FACTORS

When hydro, nuclear or geothermal electricity is accounted for as primary energy in PJ or Mtoe, a convention of 1 TWh of electricity = 2.6 TWh of primary energy has been used (table 4.2, diagram 3.1 and 3.3) and the conversion losses are included in table 4.3. Thus 1 TWh electricity = 2.6 TWh = 9.36 PJ of primary energy.

In table 5.1 final electricity demand is given in PJ (1 TWh = 3.6 PJ). Total is also given as primary energy equivalent PJ (1 TWh = 9.36 PJ).

In table 5.2 electricity supply is given in TWh.

S.I. MULTIPLIERS AND EQUIVALENTS

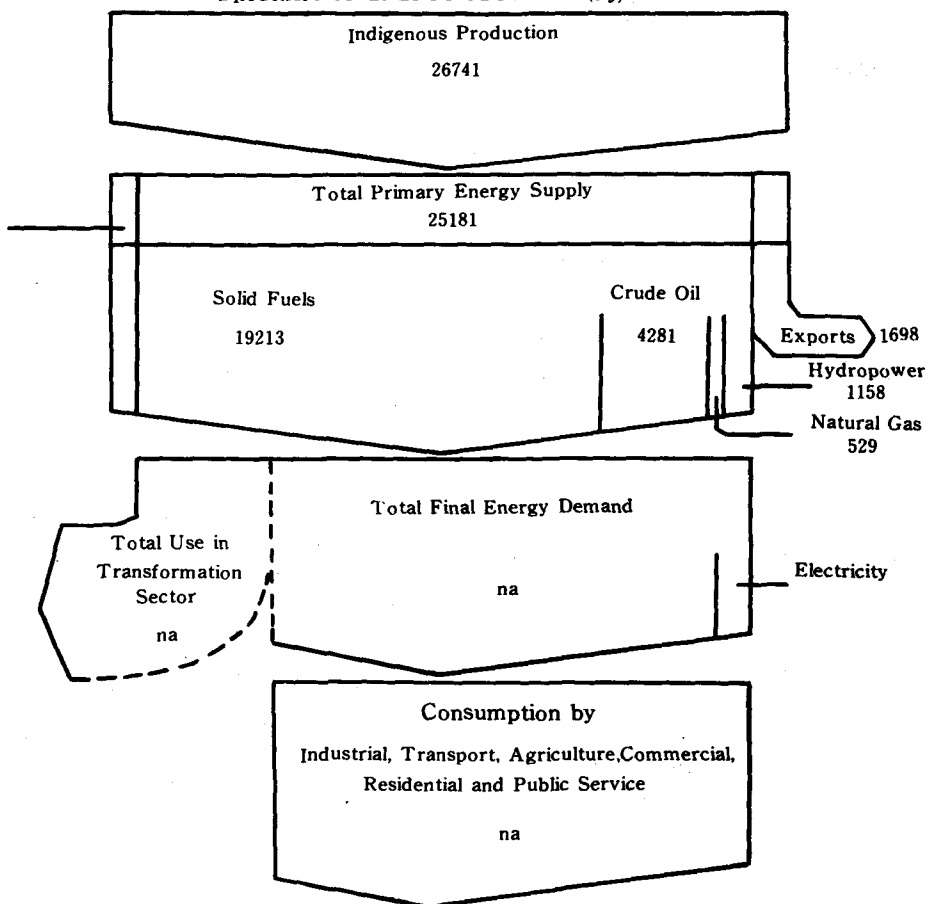The use of double prefixes should be avoided, e.g., GW not kMW.

(K) = kilo	$= 10^3$	J	$= 1$ Joule	$= 0.239$ cal	$= 1$ Ws	
(M) = mega	$= 10^6$	1 kWh final demand	$= 3.6$ MJ or 860 kcal			
(G) = giga	$= 10^9$	1 Ton	$= 1000$ kg			
(T) = tera	$= 10^{12}$	1 kg	$= 2.2046$ 1b.			
(P) = peta	$= 10^{15}$	1 Btu	$= 0.252$ kcal	$= 1.055$ kJ		
(E) = exa	$= 10^{18}$	1 Therm	$= 10^5$ Btu	$= 25200$ kcal	$= 105506$ kJ	
		1 Toc	$= 42$ GJ			
		1 Tce	$= 29.3$ GJ			

CURRENCY CONVERSION

Local currency is converted to 1980 US$ by deflating local currency values to 1980 values and using the 1980 US Dollar exchange rate (1US = 1.6319 Yuan).

POWER PLANTS (>600MW) 31. 12. 1984		Net Power MW	Year of Completion	Watercourse/Fuel
Power Plant	**Owner**			
HYDROELECTRIC POWER lPLANTS				
Xinanjiang	East China Electric Power Administration	662.5	1957-60	Xinan River
Danjiangkou	Central China Electric Power Administration	900.0	1958-73	Hanshui River
Gezhouba	Central China Electric Power Administration	840.0	1973-84	Yangtze River
Wujiangdu	Southwest Electric Power Administration	630.0	1970-82	Wujiang River
Liujiaxia	Northwest Electric Power Administration	1160.0	1959-74	Yellow River
THERMAL POWER PLANTS				
Gaojing	North China Electric Power Administration	600.0	1959-74	C
Dagang	North China Electric Power Administration	630.0	1974-79	O
Douhe	North China Electric Power Administration	1150.0	1973-84	C
Matou	North China Electric Power Administration	850.0	1958-83	C
Qinghe	Northeast Electric Power Administration	1080.0	1966-77	C
Liaoning	Northeast Electric Power Administration	650.0	1957-66	C
Wangting	East China Electric Power Administration	817.0	1956-74	C, O
Baogang	Baoshan Iron and Steel Complex, Shanghai	700.0	1978-83	C
Jianbi	East China Electric Power Administration	1025.0	1963-83	C
Huainan	East China Electric Power Administration	601.0	1955-77	C
Huaibei	East China Electric Power Administration	750.0	1968-81	C
Xindian	Shandong Provincial Electric Power Bureau	600.0	1972-77	C
Shiliquan	Shandong Provincial Electric Power Bureau	625.0	1978-83	C
Qingshan	Central China Electric Power Administration	662.0	1954-77	C
Jingmen	Central China Electric Power Administration	625.0	1976-84	C
Jinzhushan	Central China Electric Power Administration	600.0	1968-84	C
Qinling	Northwest Electric Power Administration	630.0	1969-84	C
C = Coal O = Oil				

DIAGRAM OF ENERGY FLOW 1987 (PJ)

Indigenous Production

26741

Total Primary Energy Supply

25181

Solid Fuels

19213

Crude Oil

4281

Exports 1698

Hydropower
1158

Natural Gas
529

Total Final Energy Demand

Total Use in
Transformation
Sector

na

na

Electricity

Consumption by

Industrial, Transport, Agriculture,Commercial,
Residential and Public Service

na

Ministry of Energy (MOE), Beijing, China ·
State Planning Commission (SPC), Beijing, China