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Regional Electricity Supply and Consumption in Developing Countries, 1980-1986
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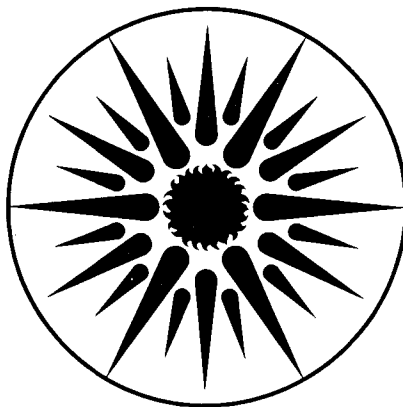
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Regional Electricity Supply and Consumption in Developing Countries, 1980-1986

Database Report

S. Meyers and C. Campbell

March 1989



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**Regional Electricity Supply and Consumption
in Developing Countries, 1980-1986**

Database Report

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March 1989

DRAFT

ABSTRACT

We describe the main statistics from a database on electricity supply and consumption by region for the developing countries for the period 1980-1986. The regions covered are Northeast Asia, Southeast Asia, South Asia, Middle East & North Africa, Sub-Saharan Africa, and Latin America & Caribbean. The variables in the database are population; installed generating capacity, disaggregated by plant type into thermal, hydro, and nuclear; electricity generation, disaggregated by source into coal, oil, gas, hydro, and nuclear; and electricity consumption, disaggregated by sector into industry, residential, commercial, transportation, and agriculture. The database is presented at the end of the report.

1. Introduction

The printouts and diskette attached to this report contain data by region on electricity supply and consumption for the developing countries for the period 1980-1986. The Figures and Tables in this report describe the main statistics. We assembled the data from a variety of sources, as described below.

The regions covered are Northeast Asia, Southeast Asia, South Asia, Middle East & North Africa, Sub-Saharan Africa, and Latin America & Caribbean (abbreviated "Latin America"). The countries included in these regions are listed below.

Northeast Asia: China, Hong Kong, Mongolia, N. Korea, S. Korea, Taiwan

Southeast Asia (includes most of Pacific): Burma, Brunei, Indonesia, Kampuchea, Laos, Malaysia, Philippines, Singapore, Thailand, Vietnam, Fiji, New Caledonia, Papua New Guinea

South Asia: Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka

Middle East & North Africa: Bahrain, Cyprus, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, UAE, N. & S. Yemen, Algeria, Egypt, Libya, Morocco, Tunisia

Sub-Saharan Africa: Africa minus North Africa (see above); includes South Africa¹

Latin America & Caribbean: All countries.

The reader should note that Northeast Asia is dominated by China (68% of total electricity generation in 1986), South Asia is dominated by India (82% of total generation in 1986), and Sub-Saharan Africa is dominated by South Africa (72% of total generation in 1986).

The variables in the database are:

1. Population (mid-year).
2. Installed generating capacity (year-end), disaggregated by plant type into Thermal, Hydro, and Nuclear.
3. Electricity generation (annual), disaggregated by source into Coal, Oil, Gas, Hydro, and Nuclear.
4. Electricity consumption (annual), disaggregated by sector into Industry, Residential, Commercial, Transportation, and Agriculture.

Section 2 following this introduction presents figures and tables on installed capacity. Section 3 covers electricity generation, focusing on generation by fuel source. Section 4 covers electricity consumption, focusing on consumption by sector.

The sources used to assemble this database are described in the following section, as are the approximations and estimates that were necessitated by lack of complete data.

¹ South Africa is sometimes not included among the developing countries, although its per capita GDP of \$1,850 (1986) places it within the range of upper middle-income developing countries.

1.1 Data Sources and Notes

Population

From United Nations *Demographic Yearbook*.

Installed Capacity

For 13 large countries, we used data that we assembled mainly from country sources. These countries are: China, India, Indonesia, Malaysia, Pakistan, the Philippines, South Korea, Taiwan, Thailand, Argentina, Brazil, Mexico, and Venezuela.

Source for other countries is the United Nations *Energy Statistics Yearbook* (ESY); 1983-86 from 1986 ESY, 1981-82 from 1984 ESY, and 1980 from 1982 ESY.

Electricity Generation

For the 13 countries listed above, we used data that we assembled mainly from country sources. The other main sources are the Nov. 1988 draft of the International Energy Agency (IEA) report, *World Energy Statistics and Balances 1971/1987*, and the UN *Energy Statistics Yearbooks*, as described below. The IEA gives electricity generation by fuel type; the UN does not. Thus, we used the IEA data for thermal generation where possible. For a few smaller countries for which the IEA did not publish data, we used the UN statistics and made assumptions regarding fuel used (as noted).

North East Asia: Hydro from UN; Thermal from IEA; Mongolia from UN, we assumed thermal generation was from coal.

South Asia: Hydro from UN; Thermal from IEA; Afghanistan and Bhutan from UN, assumed thermal generation was from oil.

South East Asia: Hydro from UN; Thermal from IEA; Kampuchea, Laos, Vietnam, Fiji, New Caledonia, Papua New Guinea from UN, assumed thermal generation was from oil.

Middle East & North Africa: Hydro from UN; Thermal from IEA.

Sub-Saharan Africa: Hydro and Thermal from IEA; for countries not listed individually in IEA, assumed thermal generation is all oil. (Note: IEA gives much higher generation for South Africa than does the UN.)

Latin America & Caribbean: Hydro from UN; Thermal from UN; except coal in Chile and Colombia, and gas in Bolivia, Colombia, Peru, and Trinidad; these came from IEA. Remainder of thermal generation was assumed to be oil.

Electricity generation includes captive industrial power plants for the 13 countries listed above (except China) and for the Latin America & Caribbean region, but probably not for most of the others, for which the thermal generation data come from the IEA report. The IEA report does not explain whether industrial self-generation is included. Such generation is included in the UN data, though it is subject to some uncertainty.

Electricity Consumption

More estimation was required for electricity consumption than for generation. For the 13 countries listed above, we used data that we assembled mainly from country sources. The main source for other countries is the Nov. 1988 draft of the International Energy Agency (IEA) report, *World*

Energy Statistics and Balances 1971/1987. For countries for which the IEA report does not have complete data, we made assumptions regarding the split between residential and commercial consumption. (This was especially the case for Sub-Saharan Africa.) For countries not given in the IEA report, we assumed consumption to be 85% of generation and split consumption 50% to industry and 25% each to residential and commercial.

Industrial consumption includes captive industrial power plants for the 13 countries listed above (except China), but probably not for most of the others. This depends on how countries reported data to the IEA.

Because of the uncertainty and inconsistency regarding inclusion of industrial self-generation in generation and consumption statistics, it is inappropriate to conclude that Generation minus Consumption equals Losses.

2. Installed Capacity of Power Plants

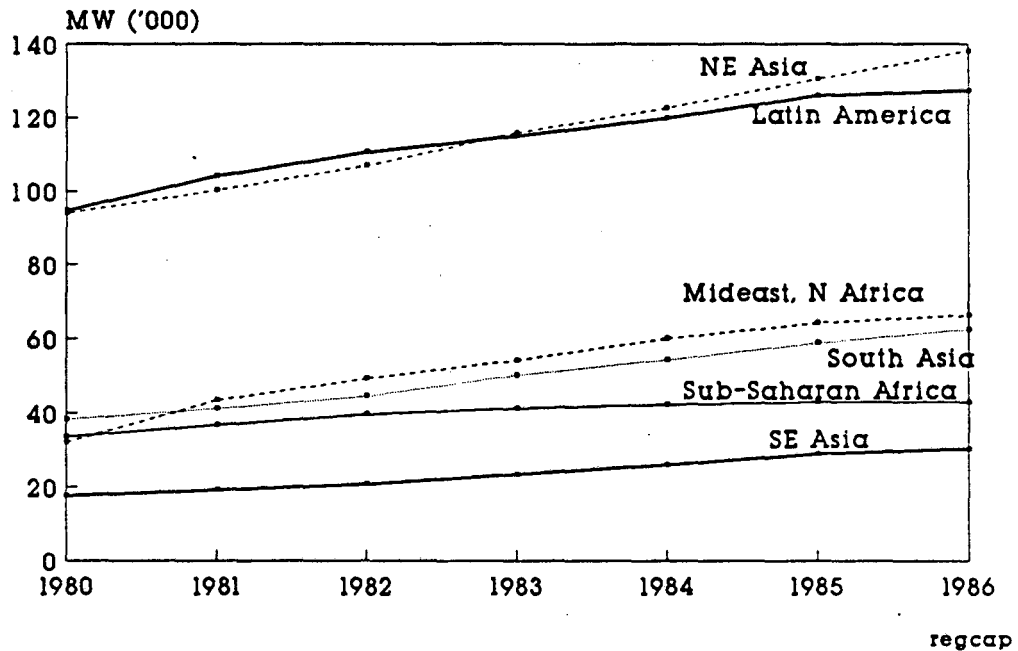
The Figures and Tables in this section describe changes in installed capacity of power plants in the 1980-86 period for the six developing country regions. The statistics nominally include captive power plants of industries. The capacity that is actually available for use is less than the installed capacity shown.

Total installed capacity for the six regions grew from 310 to 467 GW in the 1980-86 period. The thermal share of total capacity remained at 64%, while the hydro share fell from 35% to 33% and the nuclear share rose from 1% to 3%.

At year-end 1986, Northeast Asia had the most installed capacity (138 GW), followed by Latin America (127 GW). The Mideast/N.Africa had 66 GW, South Asia had 62 GW, Sub-Saharan Africa had 43 GW, and Southeast Asia had 30 GW. The thermal share of total capacity in 1986 ranged from 44% in Latin America to 90% in Mideast/N.Africa.

Growth in installed capacity averaged 7.1% p.a. for the six regions. It ranged from 4.2% in Sub-Saharan Africa to 12.9% in Mideast/N.Africa.

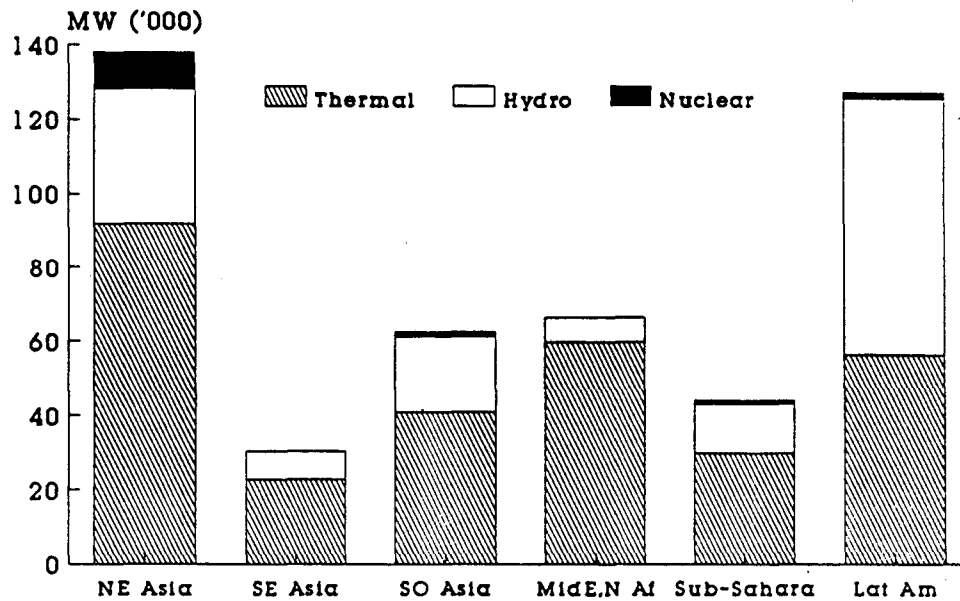
LDC INSTALLED CAPACITY By Regions



Installed Capacity of Power Plants

	GW 1986	AAGR 1980-86
Northeast Asia	138	6.6%
(China)	(87)	(4.8%)
Southeast Asia	30	9.6%
South Asia	62	8.5%
(India)	(53)	(8.7%)
Mideast/N.Africa	66	12.9%
Sub-Saharan Africa	43	4.2%
(S. Africa)	(25)	(4.9%)
Latin America	127	5.0%
TOTAL	467	7.1%

INSTALLED CAPACITY By Region, 1986

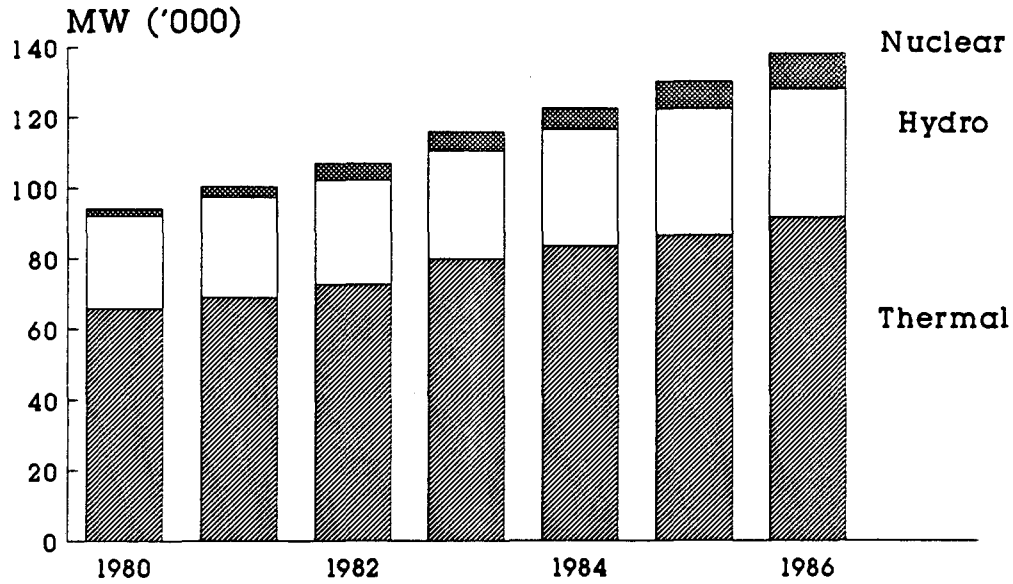


capac86

Installed Capacity of Power Plants by Plant Type, 1986 (% of total)

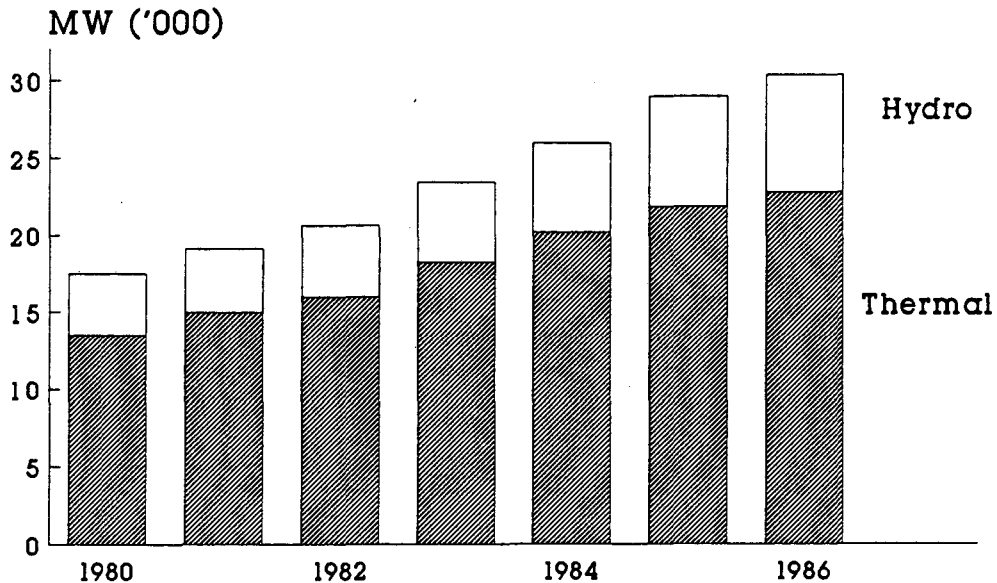
	Thermal	Hydro	Nuclear
Northeast Asia	67	26	7
Southeast Asia	75	25	0
South Asia	66	32	2
Mideast/N.Africa	90	10	0
Sub-Saharan Africa	68	30	2
Latin America	44	54	1
TOTAL	64	33	3

INSTALLED CAPACITY N.E. Asia



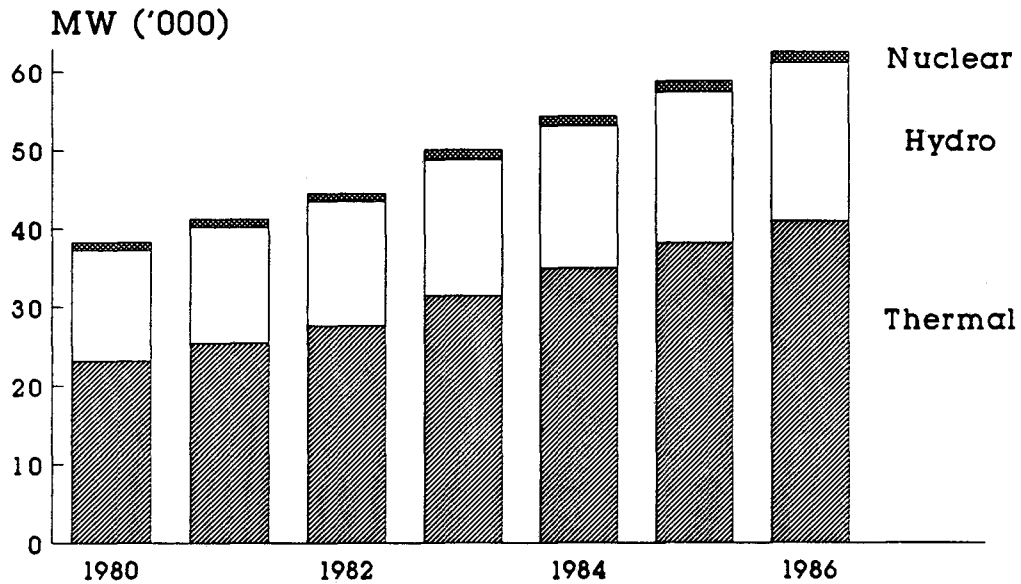
neasiacp

INSTALLED CAPACITY S.E. Asia



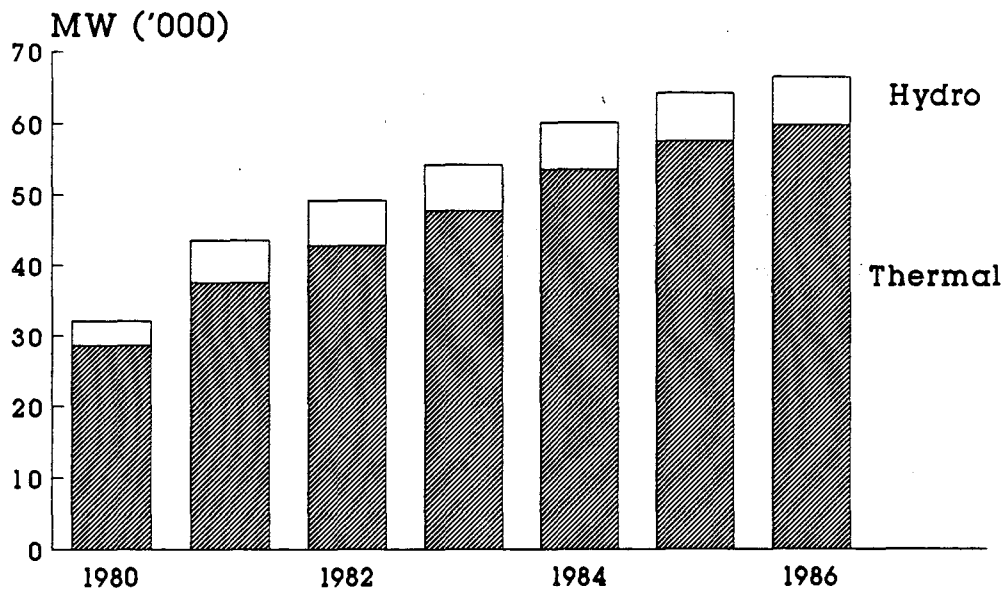
seasiacp

INSTALLED CAPACITY South Asia



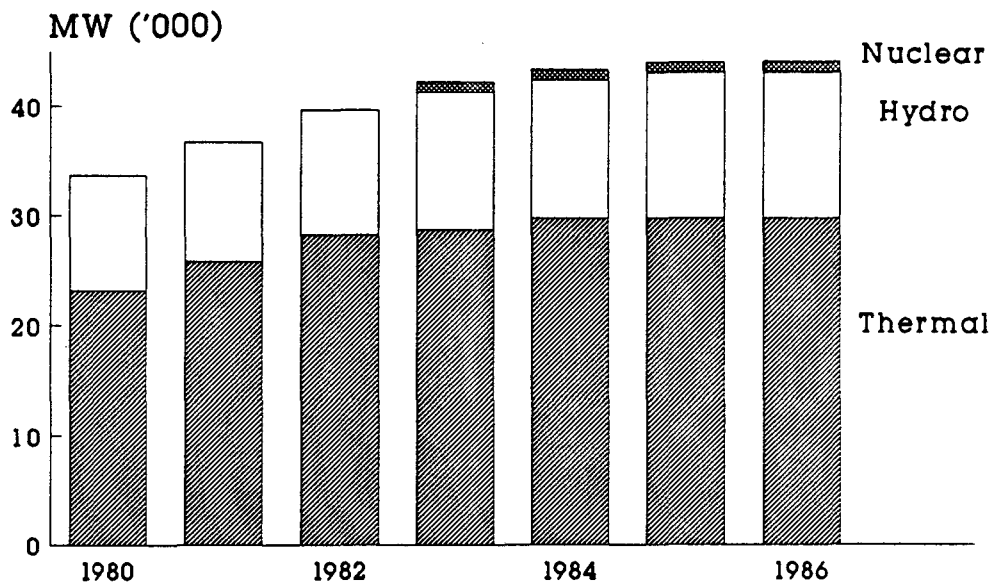
soasiacp

INSTALLED CAPACITY Mideast, N. Africa



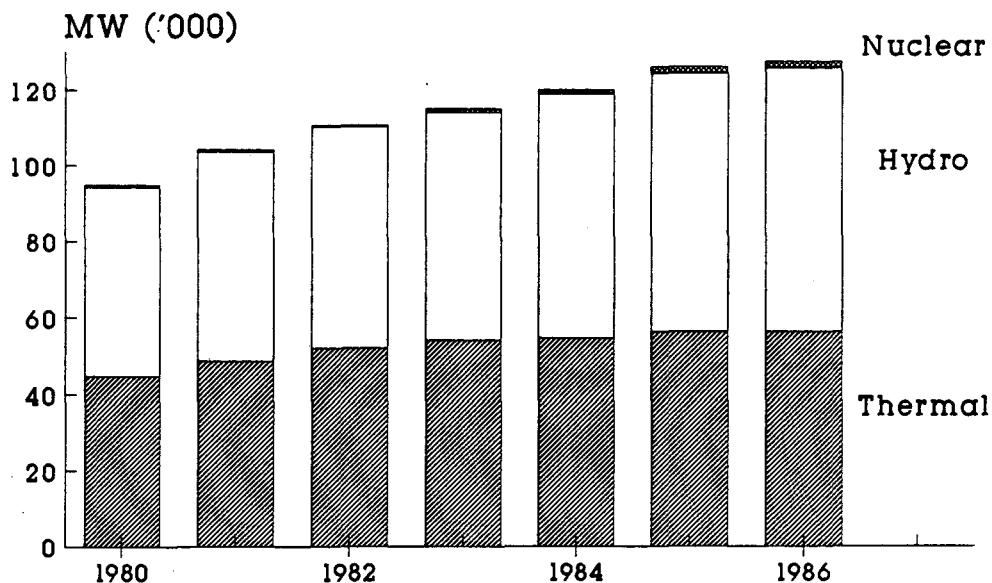
midnacp

INSTALLED CAPACITY Sub-Saharan Africa



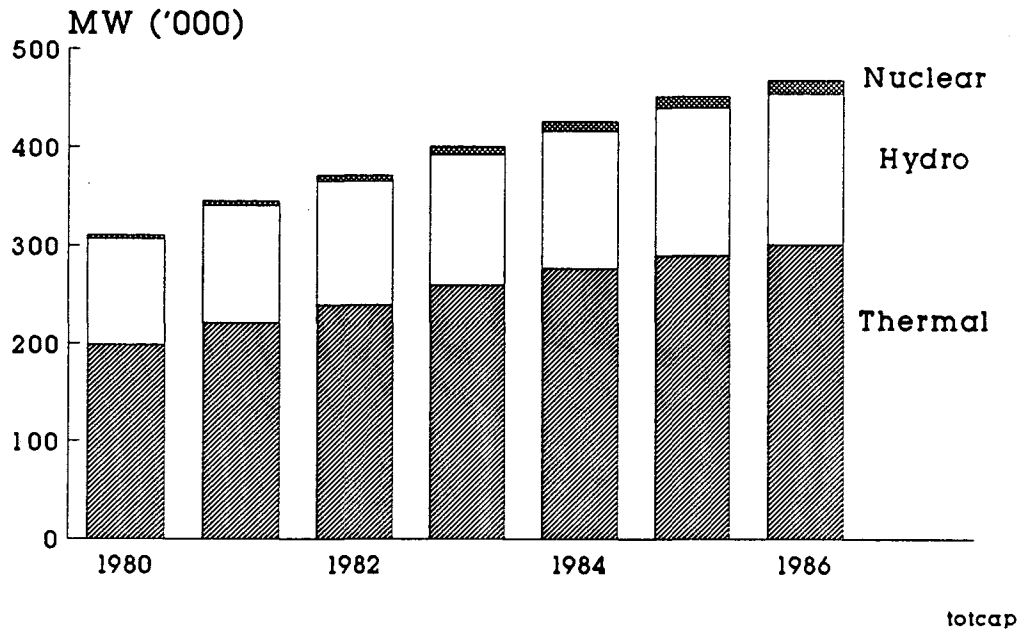
saharacp

INSTALLED CAPACITY Latin America



latamcp

INSTALLED CAPACITY All LDC Regions



3. Electricity Generation

The Figures and Tables in this section describe changes in electricity generation in the 1980-86 period for the six developing country regions. The statistics include captive power plants of industries for some but not all of the countries (see notes).

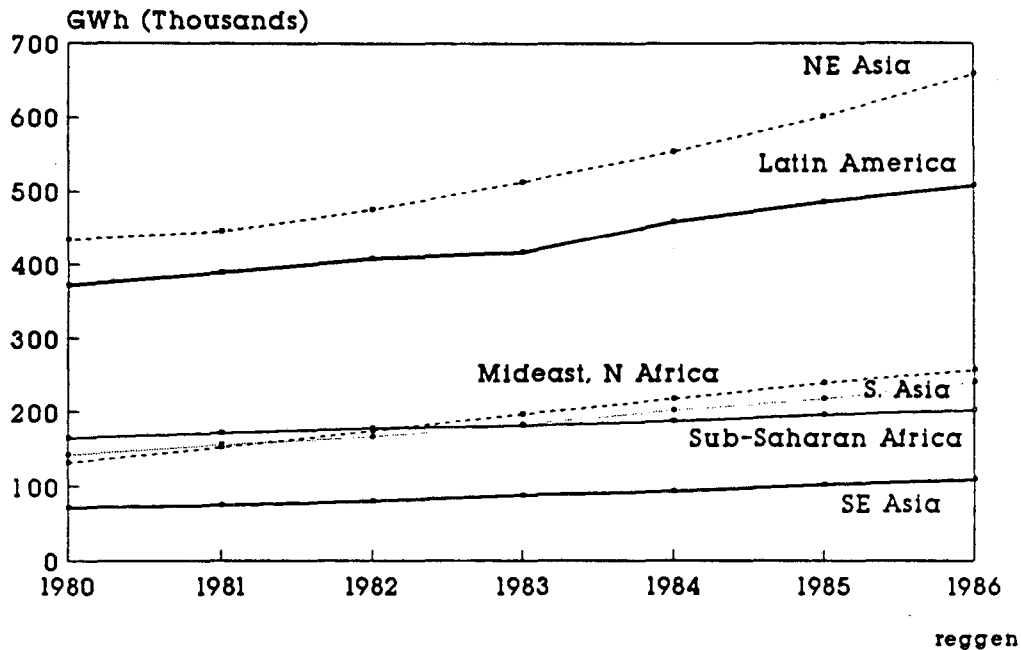
Total electricity generation for the six regions grew from 1315 to 1978 TWh in the 1980-86 period. The coal share of total generation increased from 28% to 35%, the oil share fell from 30% to 22%, the gas share rose from 6% to 8%, the hydro share fell from 34% to 31%, and the nuclear share rose from 1% to 4%.

At year-end 1986, Northeast Asia had the most electricity generation (657 TWh), followed by Latin America (508 TWh). The Mideast/N.Africa had 256 TWh, South Asia had 240 TWh, Sub-Saharan Africa had 208 TWh, and Southeast Asia had 109 TWh. The coal share of generation in 1986 ranged from 3-4% in Latin America and Mideast/N.Africa to 69% in Sub-Saharan Africa. The oil share of generation ranged from 5-6% in South Asia and Sub-Saharan Africa to 57% in Mideast/N.Africa.

Growth in electricity generation averaged 7.0% p.a. for the six regions. It ranged from 4.0% in Sub-Saharan Africa to 11.8% in Mideast/N.Africa.

Average electricity generation *per capita* for the six regions increased from 400 kWh in 1980 to 530 kWh in 1986. Regional averages in 1986 ranged from around 250 kWh in South Asia and Southeast Asia to around 1200 kWh in Mideast/N.Africa and Latin America.

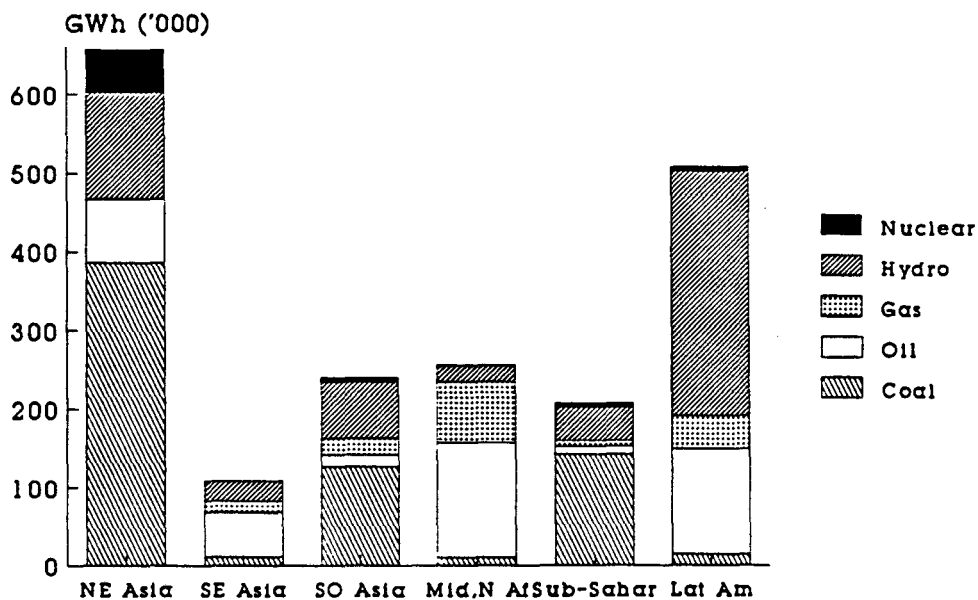
LDC ELECTRICITY GENERATION By Regions



Electricity Generation in Developing Countries

	TWh 1986	AAGR 1980-86
Northeast Asia	657	7.1%
(China)	(450)	(6.9%)
Southeast Asia	109	7.3%
South Asia	240	9.1%
(India)	(197)	(9.2%)
Mideast/N.Africa	256	11.8%
Sub-Saharan Africa	202	3.5%
(S. Africa)	(146)	(6.7%)
Latin America	508	5.3%
TOTAL	1972	7.0%

ELECTRICITY GENERATION By Region, 1986

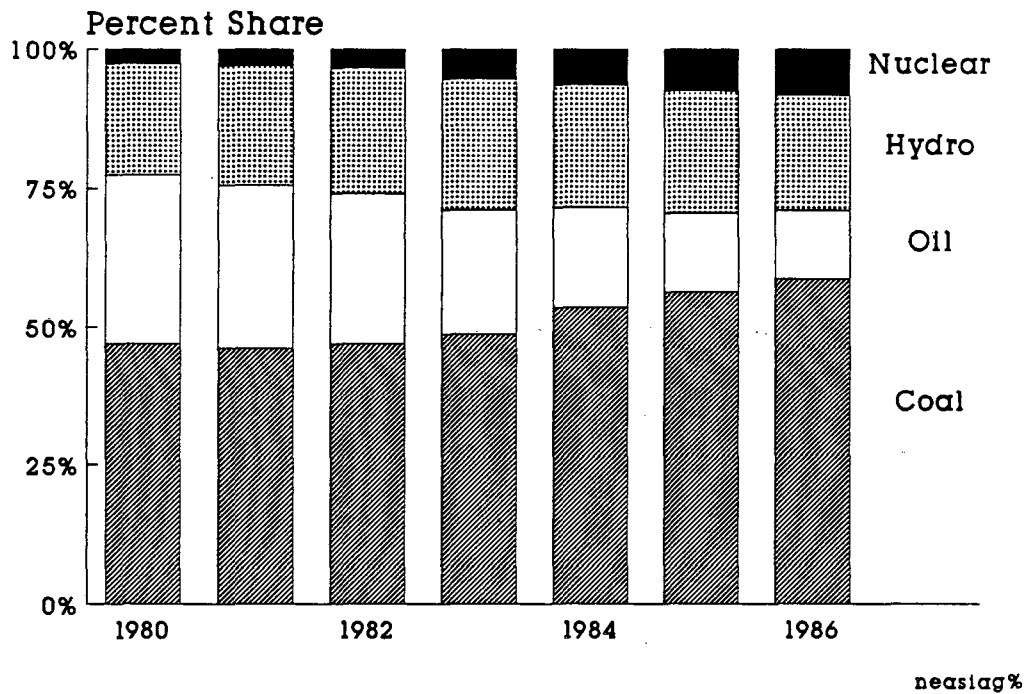
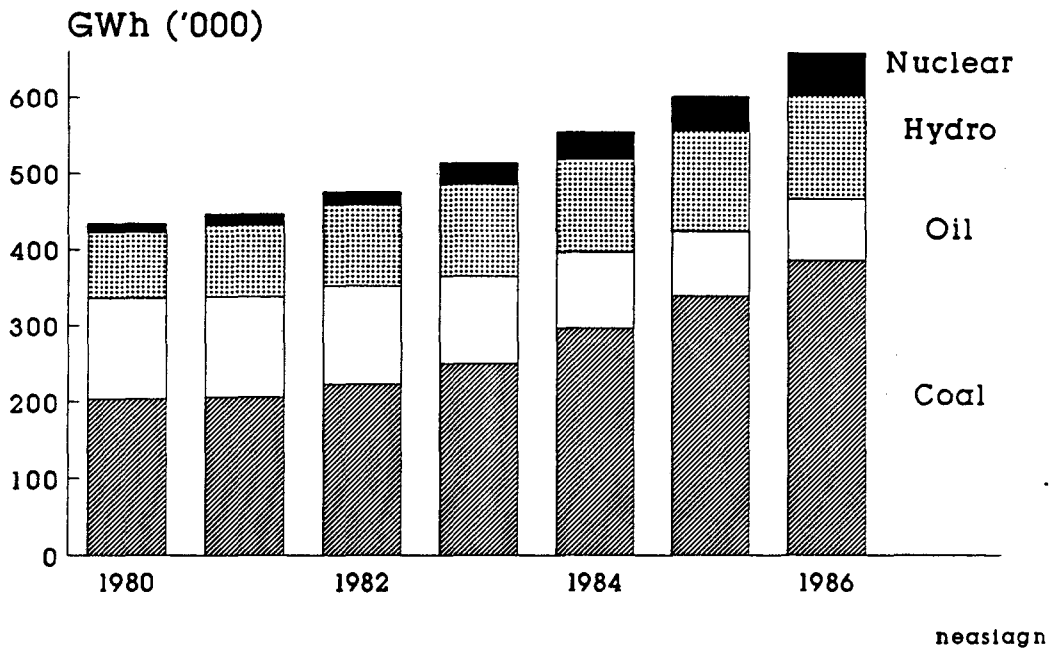


gener86

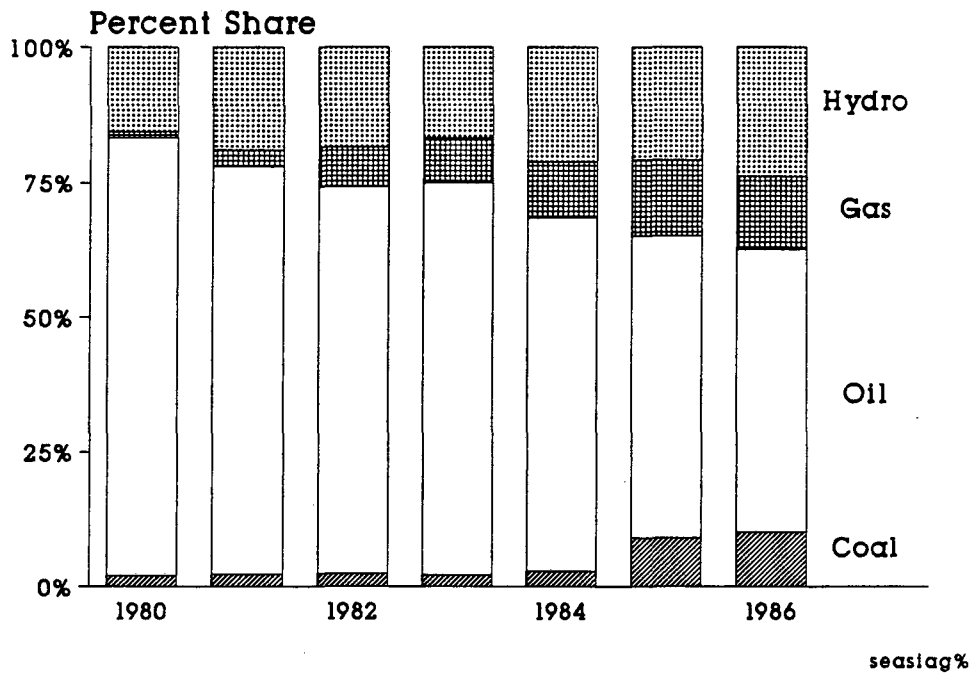
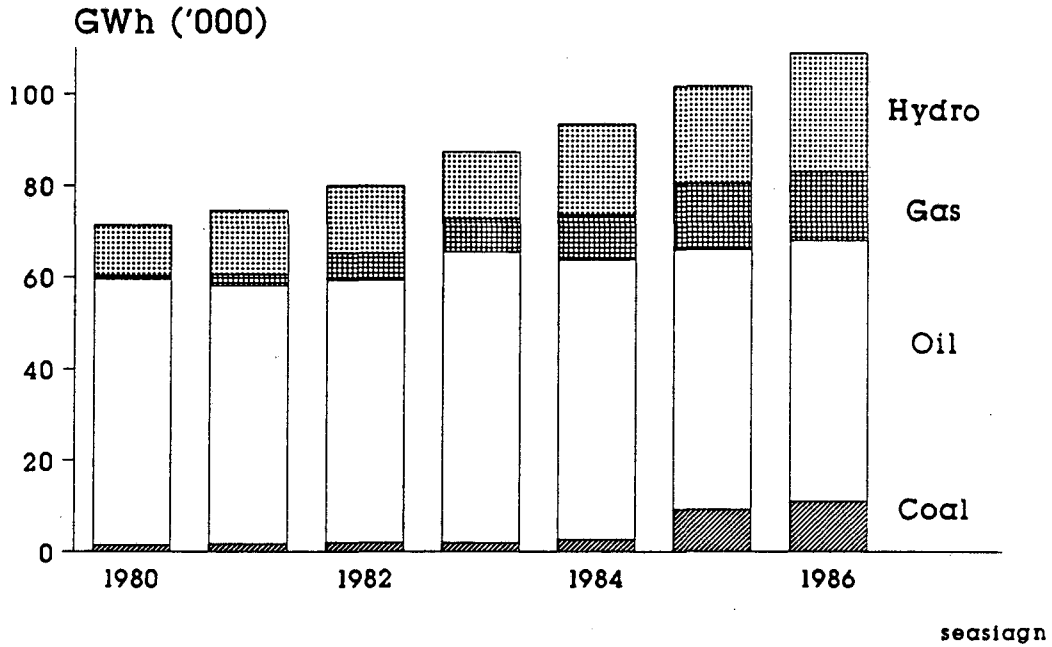
Electricity Generation by Fuel Type, 1986
(% of regional total)

	Coal	Oil	Gas	Hydro	Nuclear
Northeast Asia	59	12	0	21	8
Southeast Asia	10	52	14	24	0
South Asia	53	6	9	30	2
Mideast/N.Africa	4	57	30	8	0
Sub-Saharan Africa	69	5	4	20	3
Latin America	3	27	8	61	1
TOTAL	35	22	8	31	4

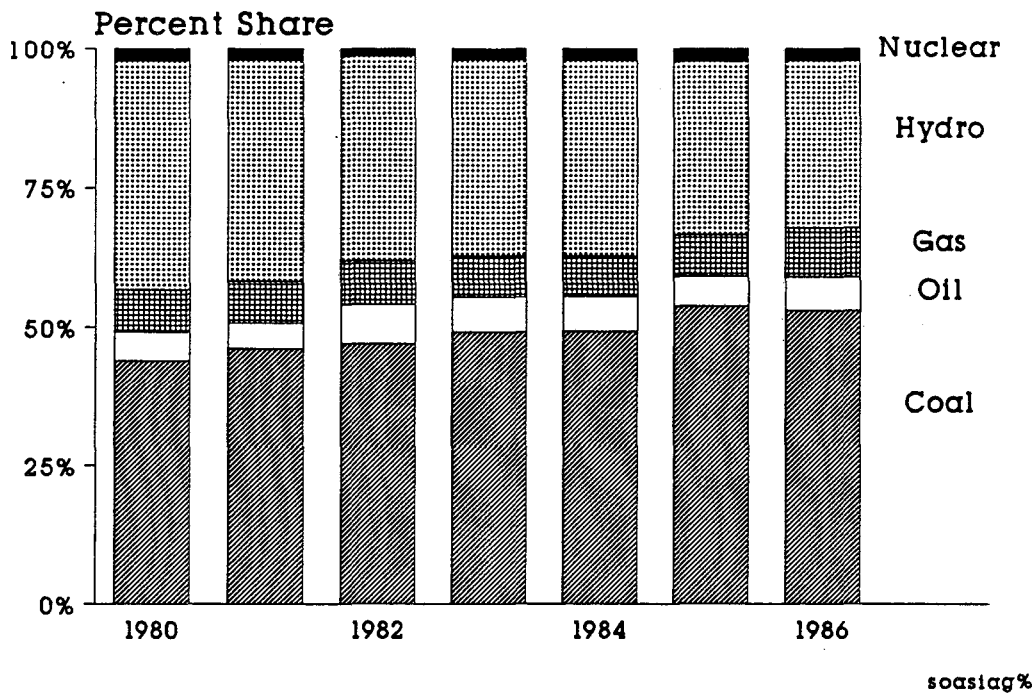
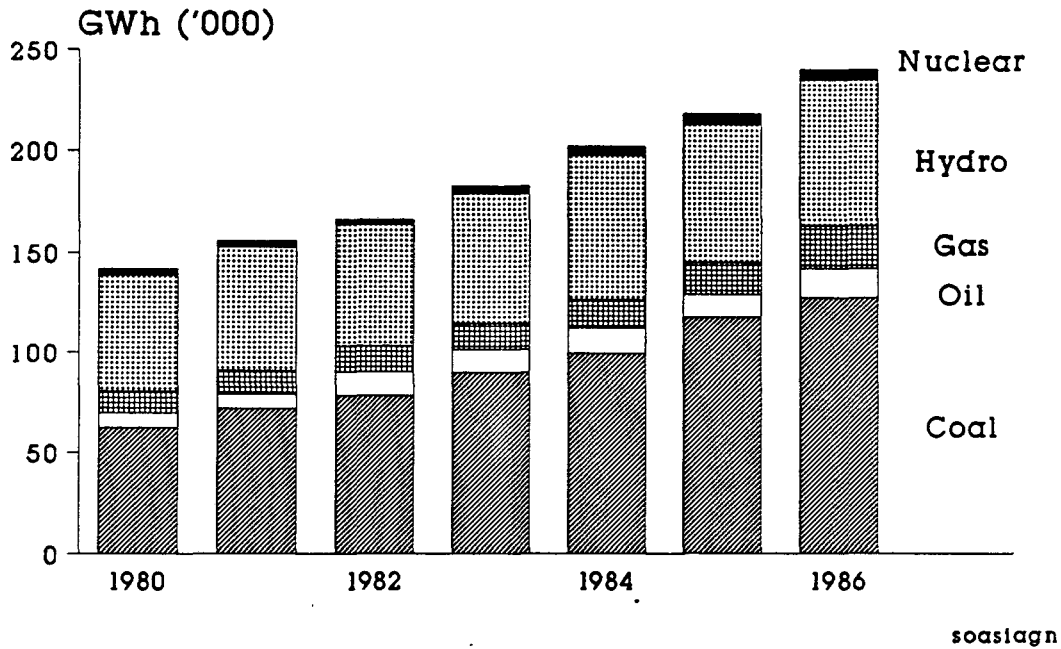
ELECTRICITY GENERATION N.E. Asia



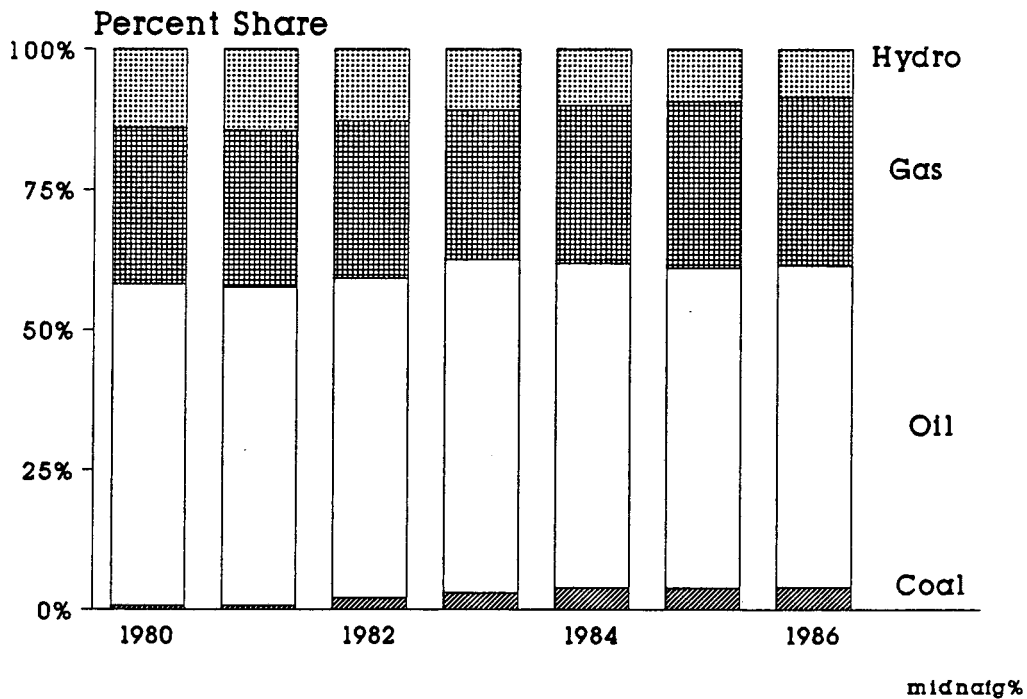
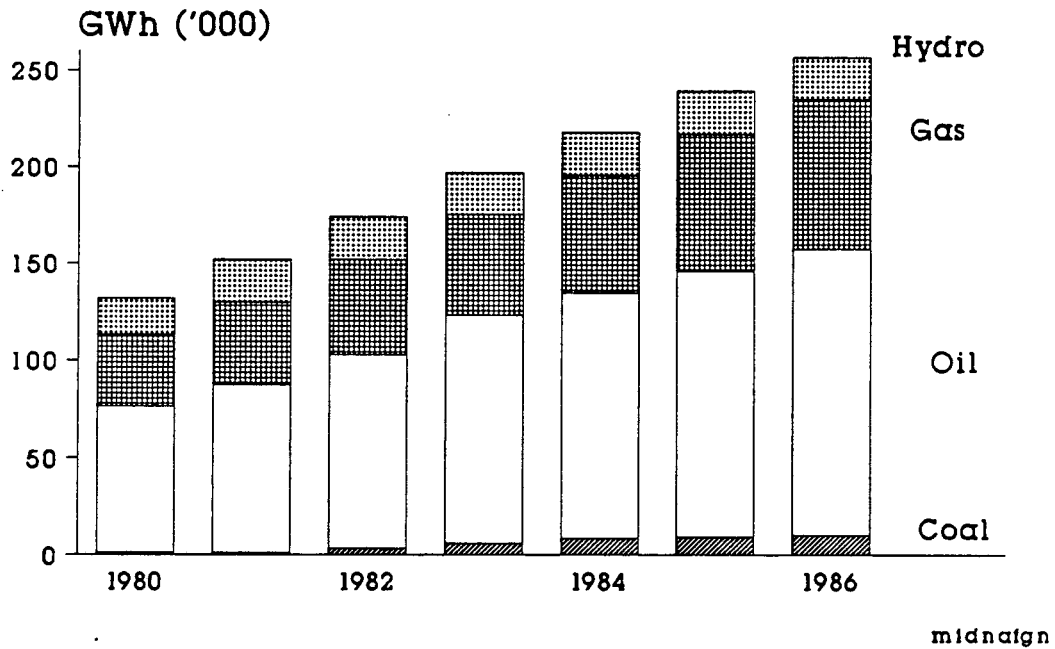
ELECTRICITY GENERATION S.E. Asia



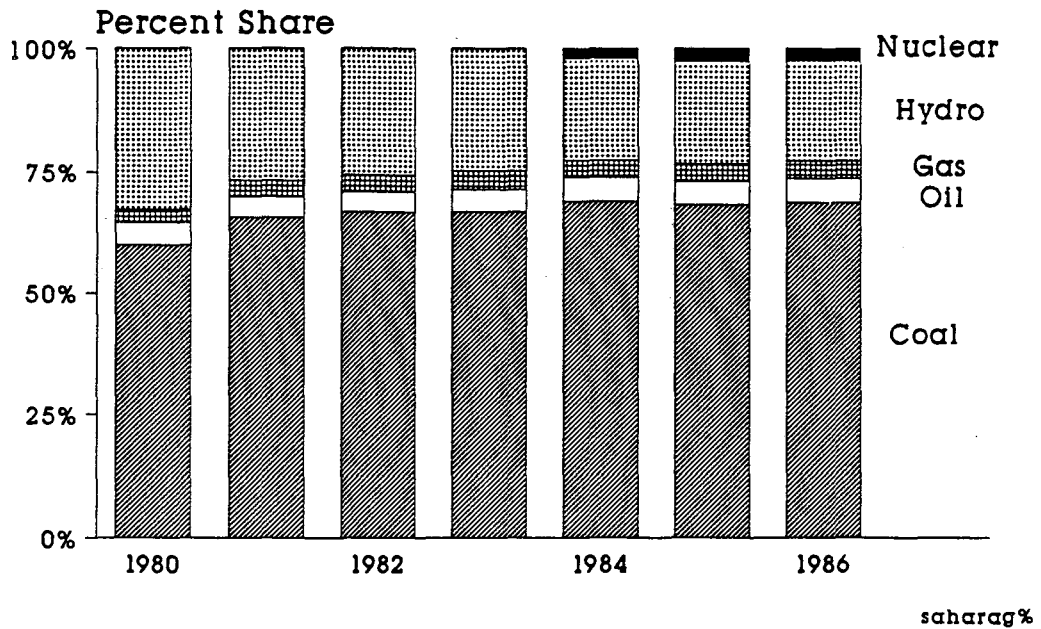
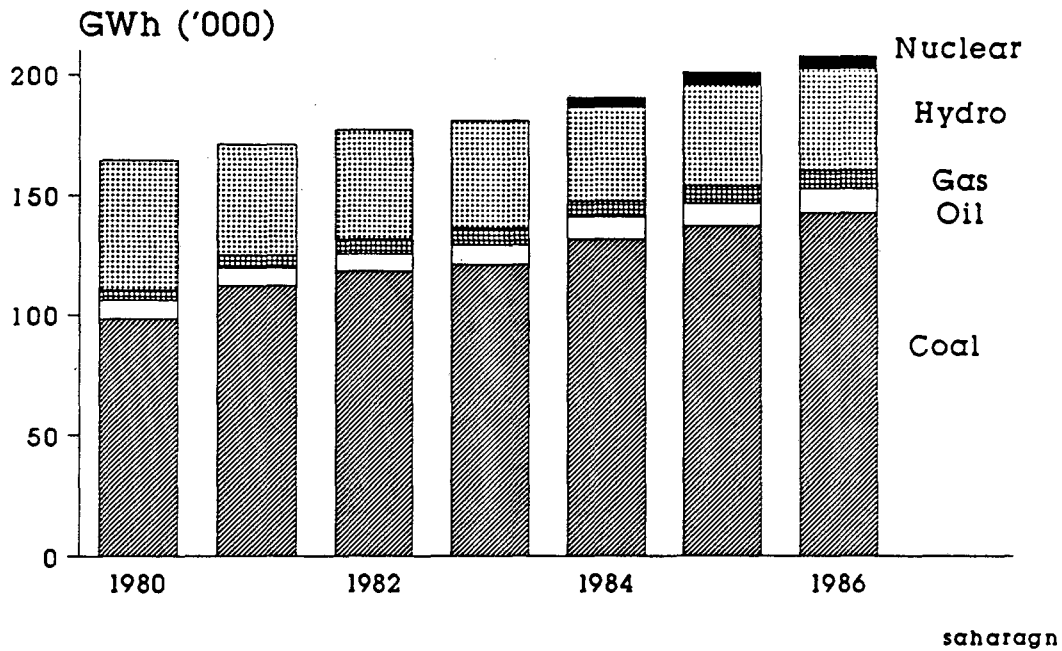
ELECTRICITY GENERATION South Asia



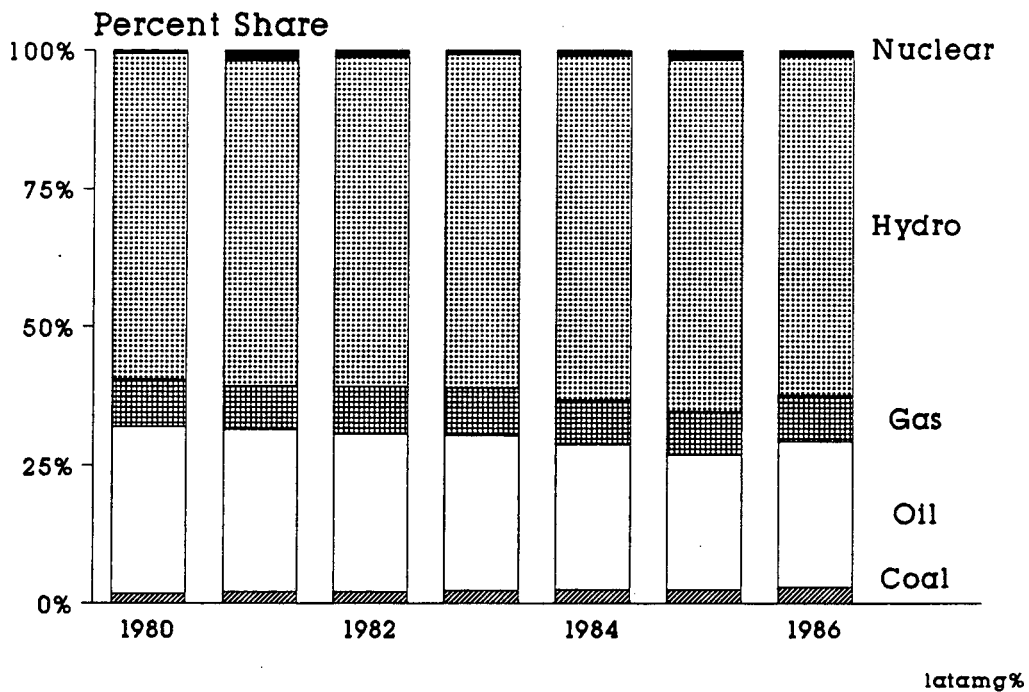
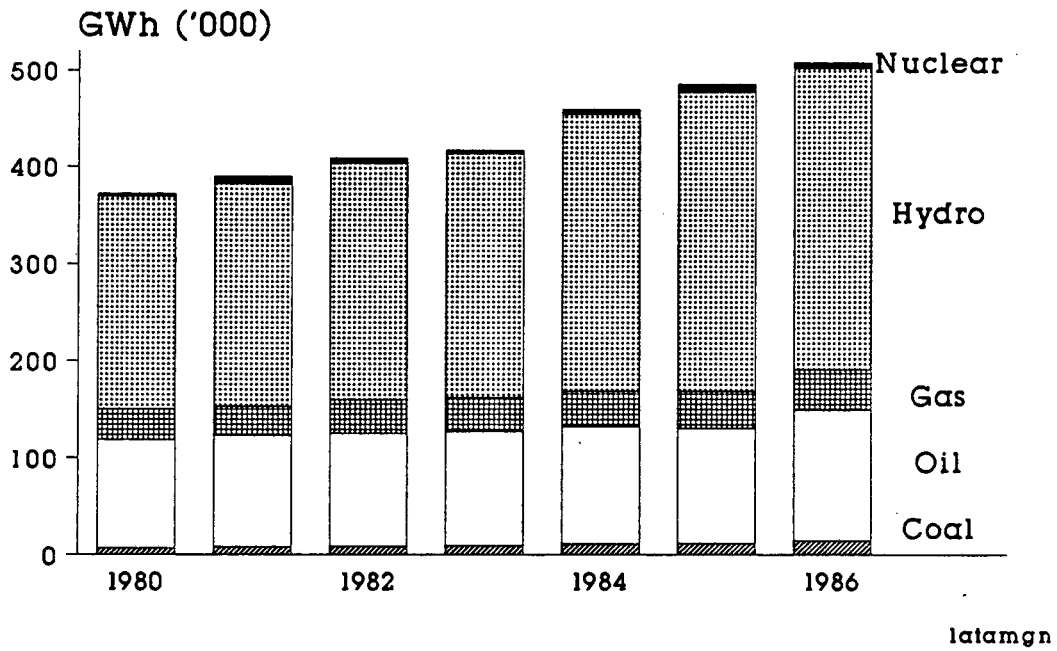
ELECTRICITY GENERATION Middle East, N. Africa



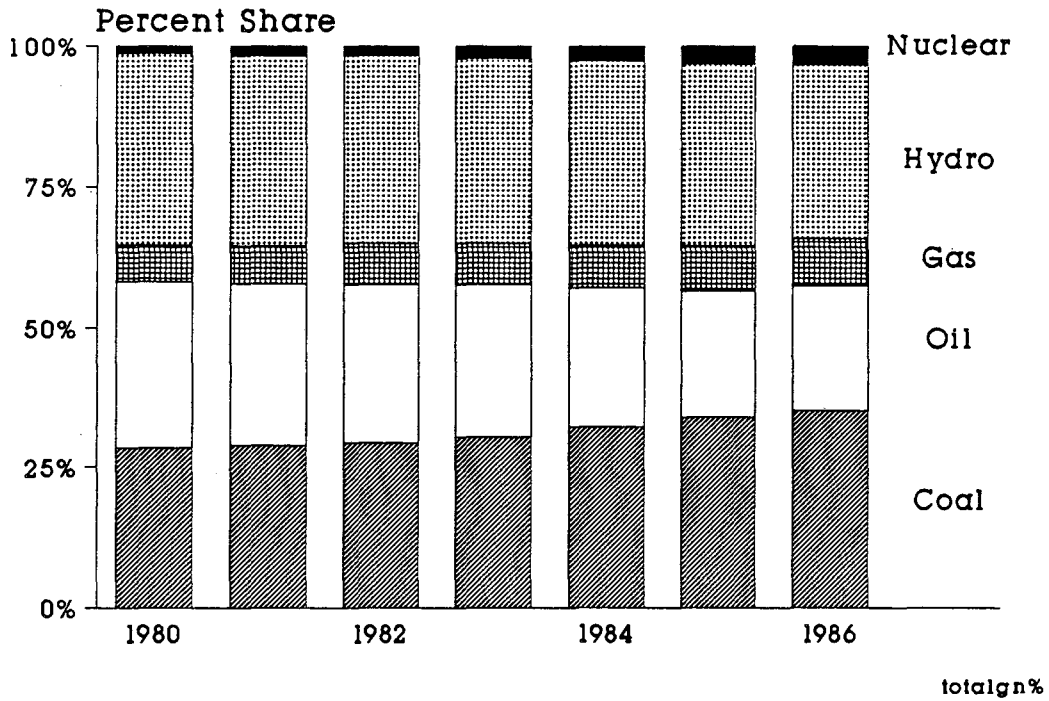
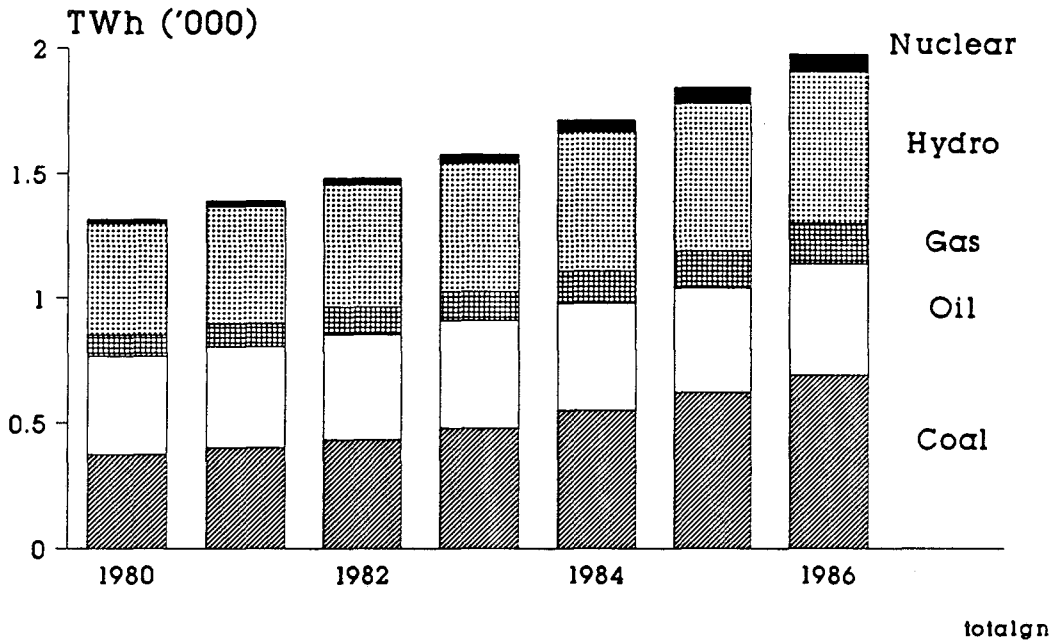
ELECTRICITY GENERATION Sub-Saharan Africa



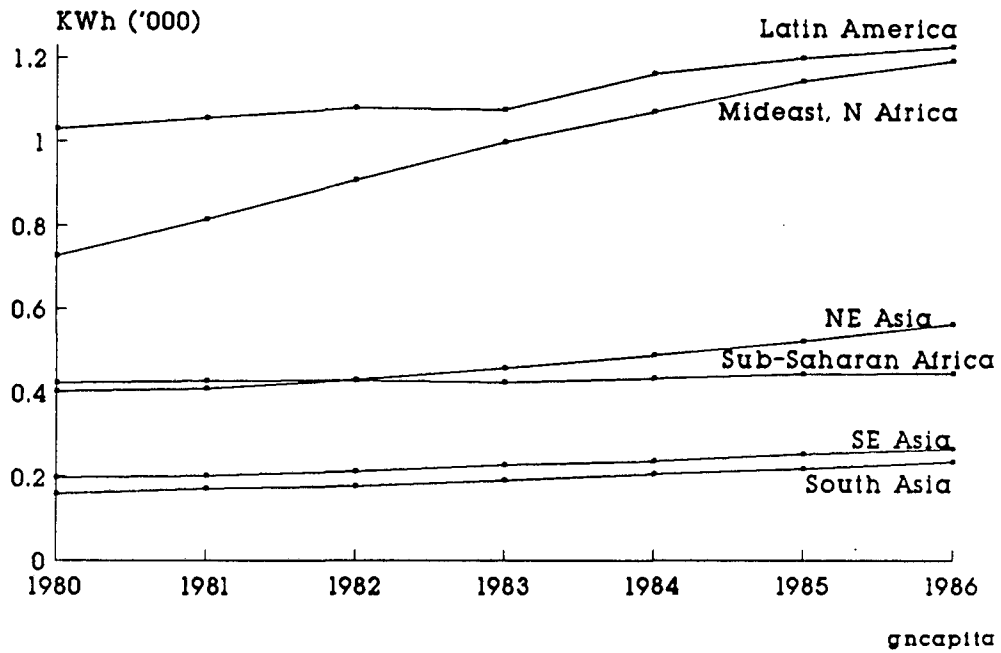
ELECTRICITY GENERATION Latin America



ELECTRICITY GENERATION All Regions



LDC ELECTRICITY GENERATION Per Capita



4. Electricity Consumption

The Figures and Tables in this section describe changes in electricity consumption in the 1980-86 period for the six developing country regions. Estimation of sectoral consumption was required in some cases (see notes). The statistics include captive power plants of industries for some but not all of the countries (see notes).

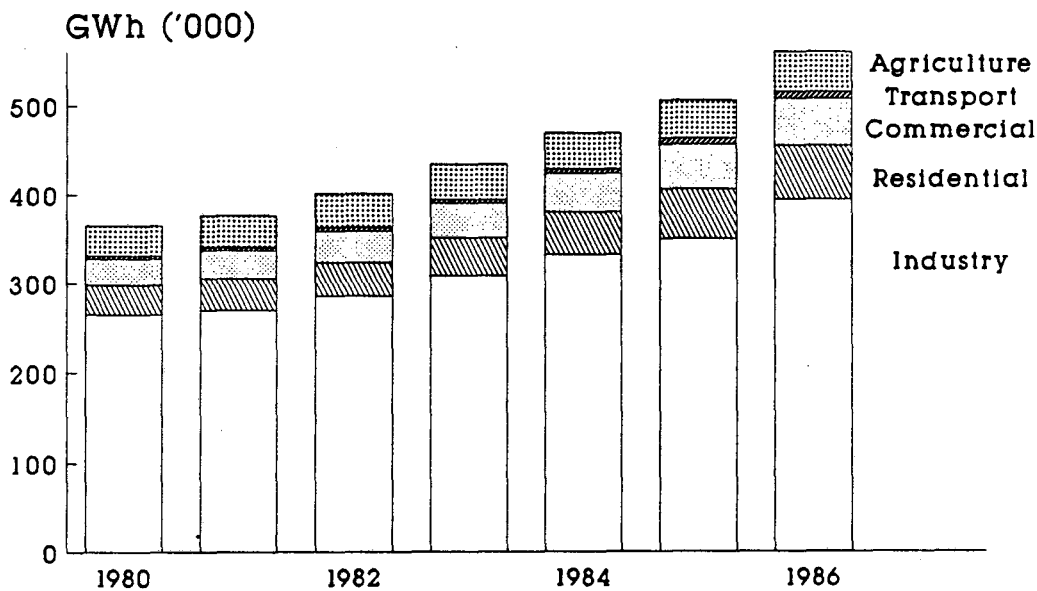
Total electricity consumption for the six regions grew from 1118 to 1669 TWh in the 1980-86 period. The industrial share of total consumption declined slightly from 61% to 59%, the residential share rose from 17% to 19%, and the commercial share remained at about 16%.

The relative standing of the regions with respect to electricity consumption parallels that of electricity generation. The industrial share of consumption in 1986 ranged from 39% in Mideast/N.Africa¹ to 70% in Northeast Asia. The residential share of consumption ranged from 11% in Northeast Asia to 33% in Mideast/N.Africa. The latter reflects the greater use of air conditioning in this region.

Growth in electricity consumption parallels that of electricity generation. It was slightly less than growth in generation due to inaccurate accounting of electricity sales and perhaps to increase in line losses.

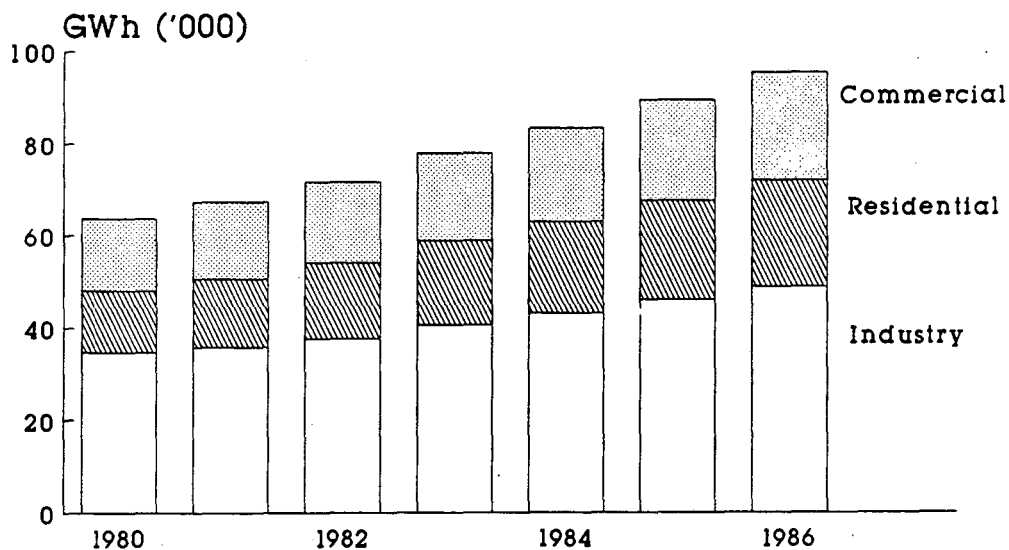
¹ It appears that there is undercounting of captive industrial electricity generation. The actual industrial share should probably be higher.

ELECTRICITY CONSUMPTION N.E. Asia



neasiacn

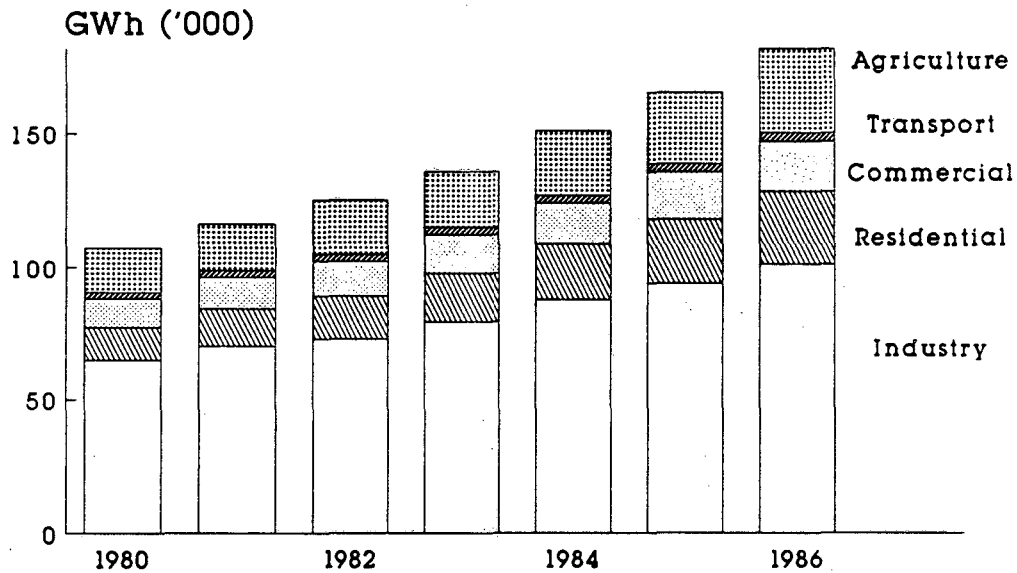
ELECTRICITY CONSUMPTION S.E. Asia



seasiacn

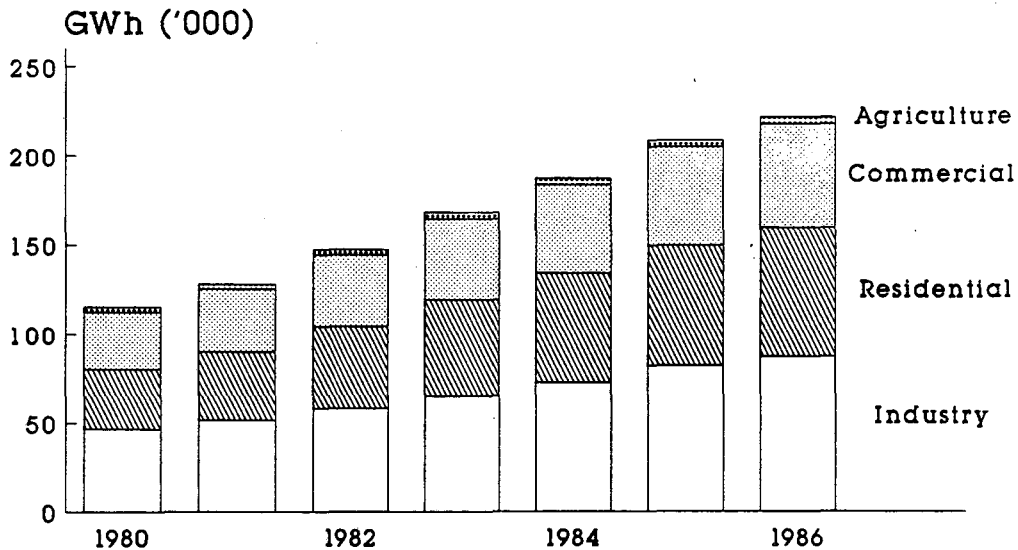
Agriculture (1%

ELECTRICITY CONSUMPTION South Asia



soasiacn

ELECTRICITY CONSUMPTION Mideast, N. Africa

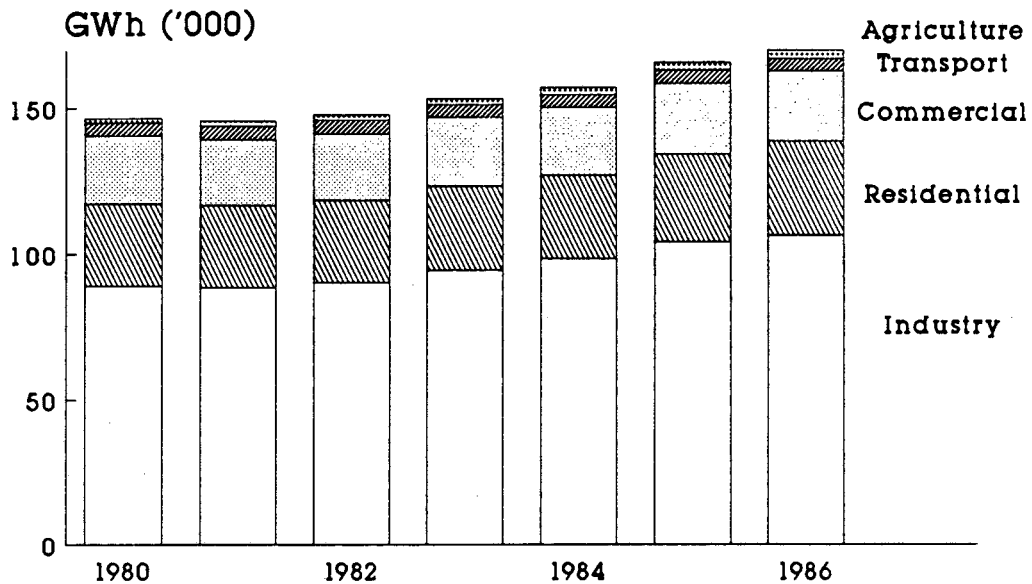


midnafcn

Transport < 1%

ELECTRICITY CONSUMPTION

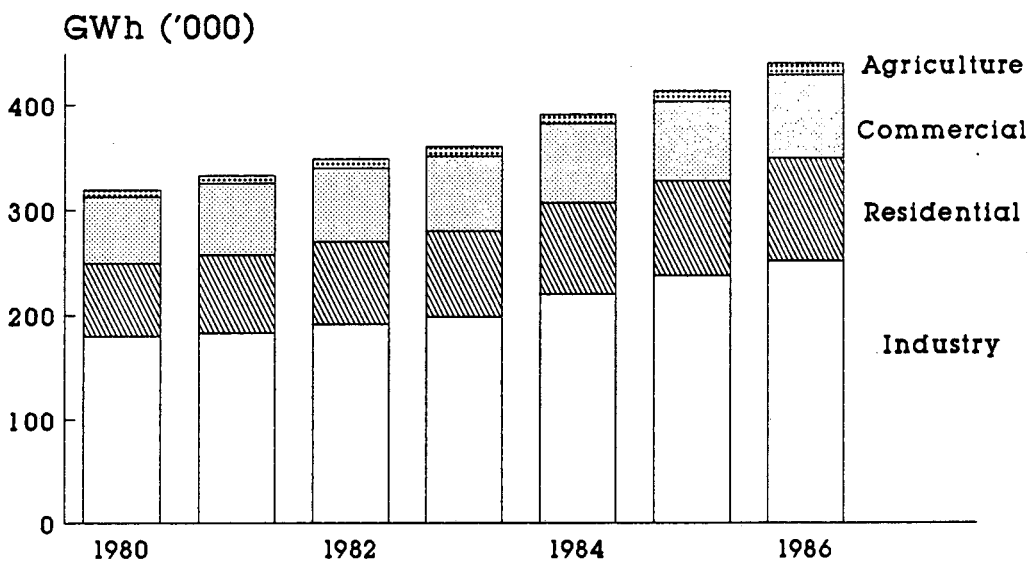
Sub-Saharan Africa



saharacn

ELECTRICITY CONSUMPTION

Latin America

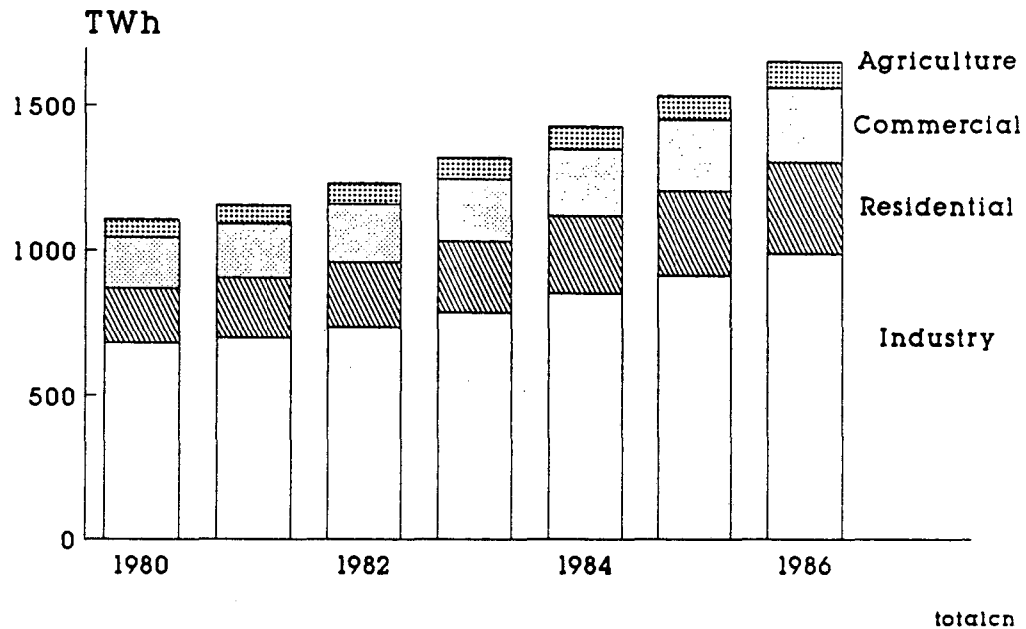


latamcn

Transport < 1%

ELECTRICITY CONSUMPTION

All LDC Regions



Electricity Consumption by Sector, 1986
(% of regional total)

	Industry	Res'l	Comm'l	Trans.	Agric.
Northeast Asia	70	11	9	1	8
Southeast Asia	51	24	25	<1	<1
South Asia	56	15	10	2	17
Mideast/N.Africa	39	33	26	<1	2
Sub-Saharan Africa	63	19	14	3	2
Latin America	57	22	18	<1	3
TOTAL	59	19	15	1	6

**Regional Electricity Supply and Consumption
in Developing Countries, 1980-1986**

Database Tables

LDC's: Regional Data on Electricity Demand and Supply

Last Update: 3/17/89 1980 1981 1982 1983 1984 1985 1986 AAGR 1980 1981 1982 1983 1984 1985 1986

*NE ASIA

	1980	1981	1982	1983	1984	1985	1986	AAGR	1980	1981	1982	1983	1984	1985	1986
Population (Mn)	1078.6	1092.7	1107.1	1121.6	1136.3	1151.3	1165.9	1.3%							
Capacity (MW)	94084	100289	106830	115732	122578	130344	138064	6.6%	Percent of Total Capacity						
Thermal	65872	68923	72774	79942	83691	86622	91865	5.7%	70%	69%	68%	69%	68%	66%	67%
Hydro	26353	28522	29548	30633	32779	35712	36289	5.5%	28%	28%	28%	26%	27%	27%	26%
Nuclear	1859	2844	4508	5157	6108	8010	9910	32.2%	2%	3%	4%	4%	5%	6%	7%
Generation (GWh)	434355	446647	475317	513071	554034	600377	656961	7.1%	Percent of Total Generation						
Thermal Subtotal	336389	337757	352270	365131	397045	423950	466771	5.6%	77%	76%	74%	71%	72%	71%	71%
Coal	203900	206155	223129	249800	297058	338459	385717	11.2%	47%	46%	47%	49%	54%	56%	59%
Oil	132489	131602	129141	115331	99987	85491	80805	-7.9%	31%	29%	27%	22%	18%	14%	12%
Gas	0	0	0	0	0	0	249		0%	0%	0%	0%	0%	0%	0%
Hydro	86290	95325	106186	120071	120608	130955	134938	7.7%	20%	21%	22%	23%	22%	22%	21%
Nuclear	11676	13565	16861	27869	36381	45472	55252	29.6%	3%	3%	4%	5%	7%	8%	8%
Per capita (KWh)	403	409	429	457	488	521	564	5.8%	Percent of Total Consumption						
Consumption	364620	376016	400734	433543	468276	505246	558972	7.4%							
Industrial	264565	269536	285061	307883	331933	349595	393325	6.8%	73%	72%	71%	71%	71%	69%	70%
Residential	33562	35864	38461	43150	47743	56009	60575	10.3%	9%	10%	10%	10%	10%	11%	11%
Commercial	29259	31575	35158	38849	43488	49456	52766	10.3%	8%	8%	9%	9%	9%	10%	9%
Transportation	3356	3702	3801	4452	5105	7422	7954	15.5%	1%	1%	1%	1%	1%	1%	1%
Agricultural	33880	35340	38254	39211	40007	42764	44353	4.6%	9%	9%	10%	9%	9%	8%	8%

LDC's: Regional Data on Electricity Demand and Supply

Last Update: 3/17/89	1980	1981	1982	1983	1984	1985	1986	AAGR	1980	1981	1982	1983	1984	1985	1986

*SE ASIA															

Population (Mn)	360.28	368.44	376.35	384.57	393.28	401.69	410.11	2.2%							
									Percent of Total Capacity						
Capacity (MW)	17491	19094	20608	23388	25902	28913	30294	9.6%							
Thermal	13508	14958	15947	18188	20137	21798	22731	9.1%	77%	78%	77%	78%	78%	75%	75%
Hydro	3983	4136	4661	5200	5765	7115	7563	11.3%	23%	22%	23%	22%	22%	25%	25%
Nuclear									0%	0%	0%	0%	0%	0%	0%
									Percent of Total Generation						
Generation (GWh)	71273	74574	79912	87431	93393	101606	108857	7.3%							
Thermal	60217	60527	65246	72859	73687	80512	83000	5.5%	84%	81%	82%	83%	79%	79%	76%
Coal	1439	1701	1950	1949	2769	9286	11116	40.6%	2%	2%	2%	2%	3%	9%	10%
Oil	58056	56494	57400	63572	61136	56866	56986	-0.3%	81%	76%	72%	73%	65%	56%	52%
Gas	722	2332	5896	7338	9782	14360	14898	65.6%	1%	3%	7%	8%	10%	14%	14%
Hydro	11056	14047	14666	14572	19706	21094	25857	15.2%	16%	19%	18%	17%	21%	21%	24%
Nuclear									0%	0%	0%	0%	0%	0%	0%
Per capita (KWh)	198	202	212	227	237	253	265	5.0%							
									Percent of Total Consumption						
Consumption (GWh)	63666	67297	71608	77834	83248	89381	95315	7.0%							
Industrial	34672	35722	37592	40521	43039	45895	48789	5.9%	54%	53%	52%	52%	52%	51%	51%
Residential	13386	14881	16450	18268	19797	21485	23056	9.5%	21%	22%	23%	23%	24%	24%	24%
Commercial	15586	16673	17533	19004	20364	21946	23413	7.0%	24%	25%	24%	24%	24%	25%	25%
Transportation	0	0	0	0	0	0	0		0%	0%	0%	0%	0%	0%	0%
Agricultural	23	20	33	41	48	55	57	16.7%	0%	0%	0%	0%	0%	0%	0%

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*SOUTH ASIA

	1980	1981	1982	1983	1984	1985	1986	AAGR	1980	1981	1982	1983	1984	1985	1986
Population (Mn)	892.07	912.32	933.7	954.9	976.6	998.3	1020.1	2.3%							
Capacity (MW)	38287	41239	44520	50048	54302	58775	62440	8.5%	Percent of Total Capacity						
Thermal	23198	25452	27644	31500	34987	38175	40962	9.9%	61%	62%	62%	63%	64%	65%	66%
Hydro	14092	14790	15879	17316	18083	19233	20111	6.1%	37%	36%	36%	35%	33%	33%	32%
Nuclear	997	997	997	1232	1232	1367	1367	5.4%	3%	2%	2%	2%	2%	2%	2%
Generation (GWh)	141968	155576	166228	182378	201632	217760	240034	9.1%	Percent of Total Generation						
Thermal	80600	90655	103060	114442	126521	144997	162928	12.4%	57%	58%	62%	63%	63%	67%	68%
Coal	62504	71890	78280	89788	99477	117340	127230	12.6%	44%	46%	47%	49%	49%	54%	53%
Oil	7359	7114	11803	11486	12601	11677	14681	12.2%	5%	5%	7%	6%	6%	5%	6%
Gas	10737	11651	12977	13168	14443	15980	21017	11.8%	8%	7%	8%	7%	7%	7%	9%
Hydro	58167	61750	60963	64162	70712	67435	71726	3.6%	41%	40%	37%	35%	35%	31%	30%
Nuclear	3201	3171	2205	3774	4399	5328	5380	9.0%	2%	2%	1%	2%	2%	2%	2%
Per capita (KWh)	159	171	178	191	206	218	235	6.7%	Percent of Total Consumption						
Consumption (GWh)	107201	116119	125030	135745	150951	165345	181627	9.2%	61%	60%	58%	58%	58%	57%	56%
Industrial	64911	70123	72899	79382	87661	93662	100949	7.6%	12%	12%	13%	14%	14%	15%	15%
Residential	12575	14201	16353	18361	21031	24288	27204	13.7%	10%	10%	10%	11%	10%	11%	10%
Commercial	10865	11951	12853	14392	15184	17555	18673	9.4%	2%	2%	2%	2%	2%	2%	2%
Transportation	2266	2550	2732	2754	2919	3152	3329	6.6%	15%	15%	16%	15%	16%	16%	17%
Agricultural	16585	17295	20194	20856	24158	26689	31471	11.3%							

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*MIDEAST, N AFRICA

	1980	1981	1982	1983	1984	1985	1986	AAGR	1980	1981	1982	1983	1984	1985	1986
Population (Mn)	181.23	186.54	192.00	197.63	203.42	209.39	215.20	2.9%							
Capacity (MW)	32051	43532	49177	54143	60047	64177	66363	12.9%	Percent of Total Capacity						
Thermal	28675	37515	42765	47686	53566	57531	59710	13.0%	89%	86%	87%	88%	89%	90%	90%
Hydro	3376	6017	6412	6457	6481	6646	6653	12.0%	11%	14%	13%	12%	11%	10%	10%
Nuclear									0%	0%	0%	0%	0%	0%	0%
Generation (GWh)	131663	151890	174117	197027	217655	239217	256429	11.8%	Percent of Total Generation						
Thermal Subtotal	113138	129811	151877	175596	195775	216907	234661	12.9%	86%	85%	87%	89%	90%	91%	92%
Coal	1010	1190	3582	6038	8579	9487	10391	47.5%	1%	1%	2%	3%	4%	4%	4%
Oil	75467	86305	99350	117155	126030	136431	147323	11.8%	57%	57%	57%	59%	58%	57%	57%
Gas	36661	42316	48945	52403	61166	70989	76947	13.2%	28%	28%	28%	27%	28%	30%	30%
Hydro	18525	22079	22240	21431	21880	22310	21768	2.7%	14%	15%	13%	11%	10%	9%	8%
Nuclear									0%	0%	0%	0%	0%	0%	0%
Per capita (KWh)	726	814	907	997	1070	1142	1192	8.6%	Percent of Total Consumption						
Consumption (GWh)	115433	128163	147356	167917	187297	208728	221698	11.5%							
Industrial	46795	51834	58239	65017	72906	82117	87129	10.9%	41%	40%	40%	39%	39%	39%	39%
Residential	33680	38140	46297	54561	61243	67418	72284	13.6%	29%	30%	31%	32%	33%	32%	33%
Commercial	32052	35489	39766	44800	49457	55255	58172	10.4%	28%	28%	27%	27%	26%	26%	26%
Transportation	107	109	104	114	115	150	150	5.8%	0%	0%	0%	0%	0%	0%	0%
Agriculture	2798	2590	2951	3425	3576	3788	3963	6.0%	2%	2%	2%	2%	2%	2%	2%

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*SUB-SAHARAN AFRICA

Population (Mn)	389.68	401.70	414.08	426.84	440.00	453.55	468.00	3.1%							
									Percent of Total Capacity						
Capacity (MW)	33618	36670	39596	42192	43315	43960	43982	4.6%							
Thermal	23151	25778	28274	28700	29765	29768	29786	4.3%	69%	70%	71%	68%	69%	68%	68%
Hydro	10467	10892	11322	12527	12585	13227	13231	4.0%	31%	30%	29%	30%	29%	30%	30%
Nuclear				965	965	965	965		0%	0%	0%	2%	2%	2%	2%
									Percent of Total Generation						
Generation (GWh)	164307	171081	177314	181023	190599	201014	207617	4.0%							
Thermal Subtotal	110461	125197	131953	136324	147612	154083	160288	6.4%	67%	73%	74%	75%	77%	77%	77%
Coal	98485	112392	118518	121221	131876	137437	142824	6.4%	60%	66%	67%	67%	69%	68%	69%
Oil	7781	7303	7261	8292	9318	9410	10140	4.5%	5%	4%	4%	5%	5%	5%	5%
Gas	4195	5502	6174	6811	6418	7236	7324	9.7%	3%	3%	3%	4%	3%	4%	4%
Hydro	53846	45884	45361	44699	39062	41616	42014	-4.1%	33%	27%	26%	25%	20%	21%	20%
Nuclear					3925	5315	5315	16.4%	0%	0%	0%	0%	2%	3%	3%
Per capita (Kwh)	422	426	428	424	433	443	444	0.9%							
									Percent of Total Consumption						
Consumption (GWh)	146550	145678	147960	153453	157072	165722	169942	2.5%							
Industrial	89118	88830	90439	94792	98765	104353	106651	3.0%	61%	61%	61%	62%	63%	63%	63%
Residential	27993	27976	28178	28481	28384	30131	32070	2.3%	19%	19%	19%	19%	18%	18%	19%
Commercial	23493	22462	22521	23788	23031	23985	23855	0.3%	16%	15%	15%	16%	15%	14%	14%
Transportation	4324	4653	4883	4340	4596	4588	4502	0.7%	3%	3%	3%	3%	3%	3%	3%
Agriculture	1621	1757	1938	2052	2296	2666	2863	9.9%	1%	1%	1%	1%	1%	2%	2%

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*LATIN AMERICA

	1980	1981	1982	1983	1984	1985	1986	AAGR	1980	1981	1982	1983	1984	1985	1986
Population (Mn)	361.10	369.30	378.20	387.40	396.00	405.20	414.40	2.3%							
Capacity (MW)	94727	104034	110579	114992	119802	125883	127249	5.0%	Percent of Total Capacity						
Thermal	44779	48702	52042	54061	54541	56291	56285	3.9%	47%	47%	47%	47%	46%	45%	44%
Hydro	49578	54962	58167	59913	64243	67917	69289	5.7%	52%	53%	53%	52%	54%	54%	54%
Nuclear	370	370	370	1018	1018	1675	1675	28.6%	0%	0%	0%	1%	1%	1%	1%
Generation (GWh)	371849	389699	408185	416653	458949	485478	507857	5.3%	Percent of Total Generation						
Thermal Subtotal	150377	153350	160080	162496	168739	169135	191435	4.1%	40%	39%	39%	39%	37%	35%	38%
Coal	6586	8197	8578	9773	11543	11985	15003	14.7%	2%	2%	2%	2%	3%	2%	3%
Oil	112428	114918	116935	117218	121109	118848	134588	3.0%	30%	29%	29%	28%	26%	24%	27%
Gas	31363	30235	34567	35505	36087	38302	41844	4.9%	8%	8%	8%	9%	8%	8%	8%
Hydro	219132	228738	243051	250752	285569	307196	310566	6.0%	59%	59%	60%	60%	62%	63%	61%
Nuclear	2340	7611	5054	3405	4641	9147	5856	16.5%	1%	2%	1%	1%	1%	2%	1%
Per capita (KWh)	1030	1055	1079	1076	1159	1198	1226	2.9%	Percent of Total Consumption						
Consumption (GWh)	320168	333874	349743	361137	391902	414652	441796	5.5%							
Industrial	180173	183191	191111	197686	219120	236997	251633	5.7%	56%	55%	55%	55%	56%	57%	57%
Residential	69028	74537	78505	81807	86633	89928	96542	5.8%	22%	22%	22%	23%	22%	22%	22%
Commercial	62730	67111	69610	70955	75032	75574	80025	4.1%	20%	20%	20%	20%	19%	18%	18%
Transportation	1283	1658	1805	1908	1605	1639	1906	6.8%	0%	0%	1%	1%	0%	0%	0%
Agriculture	6955	7377	8713	8781	9511	10514	11691	9.0%	2%	2%	2%	2%	2%	3%	3%

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*TOTAL ALL REGIONS

										Percent of Total Capacity						
Population (Mn)	3262.9	3331.0	3401.3	3472.9	3545.5	3619.4	3693.6	2.1%								
Capacity (MW)	310258	344858	371310	400495	425946	452052	468392	7.1%								
Thermal	199183	221328	239446	260077	276687	290185	301339	7.1%	64%	64%	64%	65%	65%	64%	64%	
Hydro	107849	119319	125989	132046	139936	149850	153136	6.0%	35%	35%	34%	33%	33%	33%	33%	
Nuclear	3226	4211	5875	8372	12283	16367	18267	33.5%	1%	1%	2%	2%	3%	4%	4%	
										Percent of Total Generation						
Generation (TWh)	1315.4	1389.5	1481.1	1577.6	1716.3	1845.5	1977.8	7.0%								
Thermal Subtotal	851.2	897.3	964.5	1026.8	1109.4	1189.6	1299.1	7.3%	65%	65%	65%	65%	65%	64%	66%	
Coal	373924	401525	434037	478569	551302	623994	692281	10.8%	28%	29%	29%	30%	32%	34%	35%	
Oil	393580	403736	421890	433054	430181	418723	444523	2.0%	30%	29%	28%	27%	25%	23%	22%	
Gas	83678	92036	108559	115225	127896	146867	162279	11.7%	6%	7%	7%	7%	7%	8%	8%	
Hydro	447016	467823	492467	515687	557537	590606	606869	5.2%	34%	34%	33%	33%	32%	32%	31%	
Nuclear	17217	24347	24120	35048	49346	65262	71803	26.9%	1%	2%	2%	2%	3%	4%	4%	
Per capita (KWh)	403	417	435	454	484	510	535	4.8%								
										Percent of Total Consumption						
Consumption (TWh)	1117.6	1167.1	1242.4	1329.6	1438.7	1549.1	1669.4	6.9%								
Industrial	680.2	699.2	735.3	785.3	853.4	912.6	988.5	6.4%	61%	60%	59%	59%	59%	59%	59%	
Residential	190.2	205.6	224.2	244.6	264.8	289.3	311.7	8.6%	17%	18%	18%	18%	18%	19%	19%	
Commercial	174.0	185.3	197.4	211.8	226.6	243.8	256.9	6.7%	16%	16%	16%	16%	16%	16%	15%	
Transportation	11.3	12.7	13.3	13.6	14.3	17.0	17.8	7.9%	1%	1%	1%	1%	1%	1%	1%	
Agriculture	61.9	64.4	72.1	74.4	79.6	86.5	94.4	7.3%	6%	6%	6%	6%	6%	6%	6%	

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