CAPACITY

The country's installed capacity totaled 15,681 MW. Fossil fueled power plants, which are largely located in Luzon grid, remain the dominant source with coal-fired power plants topping at 26.87 percent and oil-based power plants following at 21.38 percent. Other fuels such as hydro, natural gas, geothermal and New RE (wind and solar) have a share of 21 percent, 18 percent, 12.5 percent and 0.2 percent, respectively. The installed capacity of renewable energy has increased due to the addition of the 8 MW Northwind Power Phase II located in Bangui, Ilocos Norte which became operational in September 2008 and the 2.5 MW Sevilla Mini Hydro located in Bohol which was commissioned in November 2008. Total dependable capacity was 13,049 MW, which is 83.22 percent of the total installed capacity (Fig 1-1).

Fig. 1-1: 2008 Installed and Dependable Capacity, MW

PLANT TYPE	PHILIPPINES			
	Capacity (MW)		Percent Share (%)	
	Installed	Dependable	Installed	Dependable
Coal	4,213	3,412	26.87	26.15
Oil Based	3,353	2,702	21.38	20.71
Natural Gas	2,831	2,562	18.05	19.64
Geothermal	1,958	1,388	12.49	10.63
Hydro	3,291	2,950	20.99	22.61
Wind	33	33	0.21	0.25
Solar	1	1	0.01	0.01
TOTAL	15,681	13,049		

ELECTRIC POWER GENERATION

Generation by Plant Type

Gross power generation in 2008 reached 60,821 gigawatt-hours (GWh), 2.03 percent higher than 59,612 GWh in 2007. Fossil fuel production decreased by 1.43 percent, from 40,775 GWh in 2007 to 40,193 GWh in 2008. On the other hand, generation from renewable energy is higher by 9.51 percent at 20,628 GWh in 2008 from 18,837 GWh in 2007. (Fig. 1-2).

Natural gas-fired remains the top producer of electricity with a total generation of 19,576 GWh, accounting for 32.19 percent of the country's total gross generation. This marks the fourth consecutive year in which natural gas-fired had the biggest share on gross

generation since replacing coal-fired in 2005. The increase of 4.19 percent on natural gas-fired generation shows also an increase in its average capacity factor by 3.86 percent, from 75.76 percent in 2007 to 78.94 percent in 2008.

Fig. 1-2: 2008 and 2007 Comparative Generation by Source, GWh

Plant Type	PHILIPPINES					
	2008		2007		Difference	
	GWh	% Share	GWh	% Share	GWh	%
Fossil Fuel	**40,193**	**66.08**	**40,775**	**68.40**	**(582)**	**(1.43)**
Coal	15,749	25.89	16,837	28.24	(1,088)	(6.46)
Oil-based	4,868	8.00	5,148	8.64	(280)	(5.43)
Natural Gas	19,576	32.19	18,789	31.52	786	4.19
Renewable Energy	**20,628**	**33.92**	**18,837**	**31.60**	**1,791**	**9.51**
Geothermal	10,723	17.63	10,215	17.14	508	4.97
Hydro	9,843	16.18	8,563	14.37	1,279	14.94
New RE (Wind/Solar)	63	0.10	59	0.10	4	5.98
Total Generation	60,821	100	59,612	100	1,209	2.03

Coal-fired generation was the second leading contributor to total gross generation with 25.89 percent share of the mix.. However, its share to the total generation mix declined by 6.46 percent, from 16,837 GWh in 2007 to 15,749 GWh in 2008. Some coal-fired power plants in Luzon were unavailable to operate due to annual overhauling. (e.g. 300 MW Calaca 2 on November 2007 to May 2008 and 300 MW Masinloc 1 from August 2007 to April 2008) Also, in July 2008 the Luzon transmission line experienced transformer congestion at San Jose Substation in Bulacan. The congestion constrained the flow of energy from coal and hydro plants in Northern Luzon, in which Sual (1,294 MW) and Masinloc (600 MW) plants are located, and occurred until 6 October 2008 with the completion of the replacement transformer at the San Jose Substation. In Mindanao, coal-fired generation decreased by 4.55 percent from 1,571 GWh in 2007 to 1,499 GWh in 2008 due to the increased utilization of hydroelectric plant.

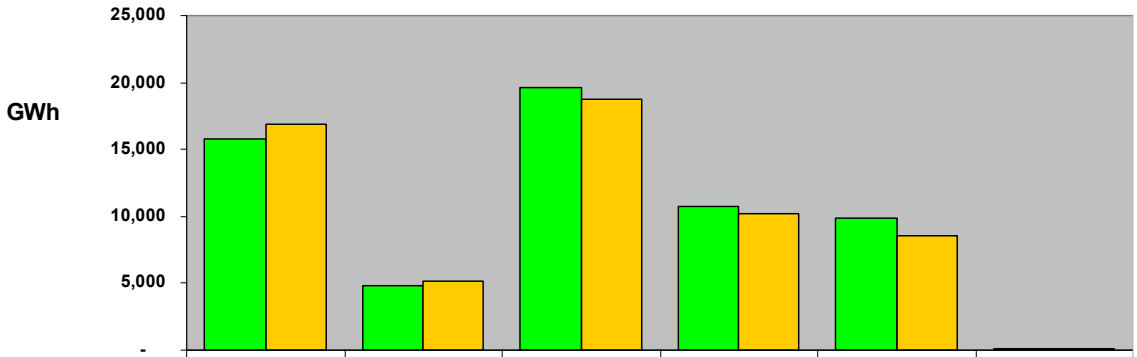
Gross generation from geothermal energy recorded an increase of 4.97 percent, from 10,215 GWh in 2007 to 10,723 GWh in 2008. This was attributed to the increased of energy transferred from Leyte-Samar to Luzon via Leyte-Luzon High Voltage Direct Current (HVDC). Total energy transfer increased by 55.21 percent from 720 GWh in 2007 to 1,117 GWh in 2008. Also, the unavailability of coal fired plants in Luzon gave way to more utilization of geothermal, hydro and natural gas. Geothermal generation accounted for 17.63 percent of total gross generation in 2008.

Due to frequent rains in the summer months of 2008, generation from hydroelectric plant increased by 14.94 percent, from 8,563 GWh in 2007 to 9,843 GWh in 2008. Its share to total generation mix increased by 1.81 points from 14.37 percent in 2007 to 16.18 percent in 2008.

Oil-based gross generation which accounted for 8.00 percent of the total gross generation, dwindled by 5.43 percent, from 5,148 GWh in 2007 to 4,868 GWh in 2008. On a per grid

basis, despite the high dispatch of oil-based plants during the period which constrained the flow of coal and hydro plants in San Jose Substation, its share to total generation in Luzon grid was only 4.36 percent. Meanwhile, oil-based power plants in Visayas grid has an increased generation equivalent to 1,665 GWh in 2008. This is 12.71 percent higher than the 2007 generation level of 1,477 GWh. Oil-based generation in Mindanao decreased by 13.77 percent, from 1,479 GWh in 2007 to 1,275 GWh in 2008 (Fig 1-3).

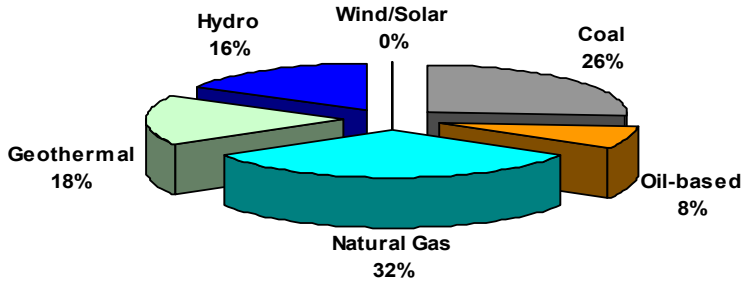
Fig 1-3: 2008 and 2007 Generation by Source



	Coal	Oil-based	Natural Gas	Geothermal	Hydro	New RE
2008 (GWh)	15,749	4,868	19,576	10,723	9,843	63
2007 (GWh)	16,837	5,148	18,789	10,215	8,563	59

Generation of New RE such as wind in Luzon and solar in Mindanao increased by 5.98 percent from 59 GWh in 2007 to 63 GWh in 2008. Its share to total gross generation remained unchanged from 2007 at 0.10 percent (Fig 1-2).

Fig. 1-4: 2008 Gross Generation by Source, 60,821 GWh



Generation by Ownership

As the privatization of NPC-owned plants progresses, the share of NPC power plants to the total generation by ownership continues to decline. With the transfer of NPC's 600 MW Masinloc CFTPP to Masinloc Power AES and 175 MW Ambuklao-Binga to SN Aboitiz Power Corp., the share of NPC to the total generation decreased by 15.89 percent.

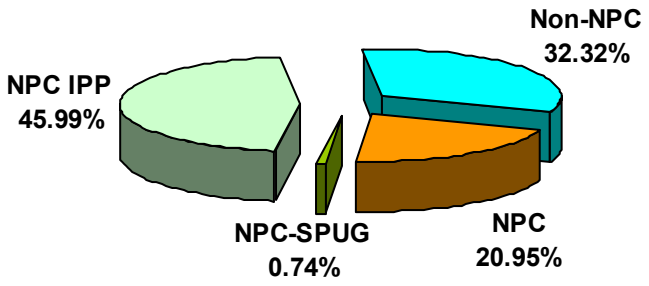
This development in turn increased the contribution of non-NPC plants by 10.20 percent, from 17,867 GWh in 2007 to 19,658 GWh in 2008. Gross generation from NPC-IPP and NPC-SPUG also went up by 6.94 percent and 2.44 percent, respectively.

Fig. 1-5: 2008 and 2007 Comparative Generation by Ownership/Utilities

Total PHILIPPINES	2008		2007		Change	
	GWh	% Share	GWh	% Share	GWh	%
NPC	12,743	21	15,151	25	-2,408	-15.89
NPC-SPUG	448	1	437	1	11	2.44
NPC IPP	27,972	46	26,156	44	1,816	6.94
Non-NPC	19,658	32	17,867	30	1,790	10.02
Total Generation	60,821		59,612		1,209	2.03

Electric power generation from NPC-IPP contributed the largest share at 45.99 percent or 27,972 GWh. This was followed by non-NPC at 32.32 percent or 19,658 GWh. NPC accounted for 20.95 percent or 12,743 GWh of the total generation in 2008 as compared to 25.42 percent or 15,151 GWh in 2007. The share of NPC-SPUG to total generation remained unchanged from 2007 at less than one percent (Fig. 1-5 and Fig 1-6).

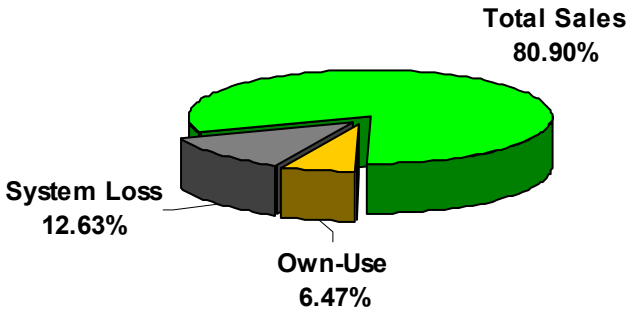
Fig. 1-6: 2008 Generation by Ownership/Utilities, 60,821 GWh



ELECTRICITY SALES AND CONSUMPTION

The country's electricity sales slightly increased by 2.49 percent from 48,009 GWh in 2007 to 49,206 GWh in 2008. Out of these total sales, 33,097 GWh or 67.26 percent was contributed by Private Investor Owned Utilities (PIOU's), while electricity sales from Electric Cooperatives and Non-utilities were 10,992 GWh or 22.34 percent and 5,117 GWh or 10.4, respectively. Total sales accounted for 49,206 GWh or 80.90 percent to total consumption. "Own-use" of power plants and distribution utilities was pegged at 3,935 GWh or 6.47 percent. Losses from generator, transmission and distribution accounted for 7,680 GWh or 12.63 percent (Fig 1-7).

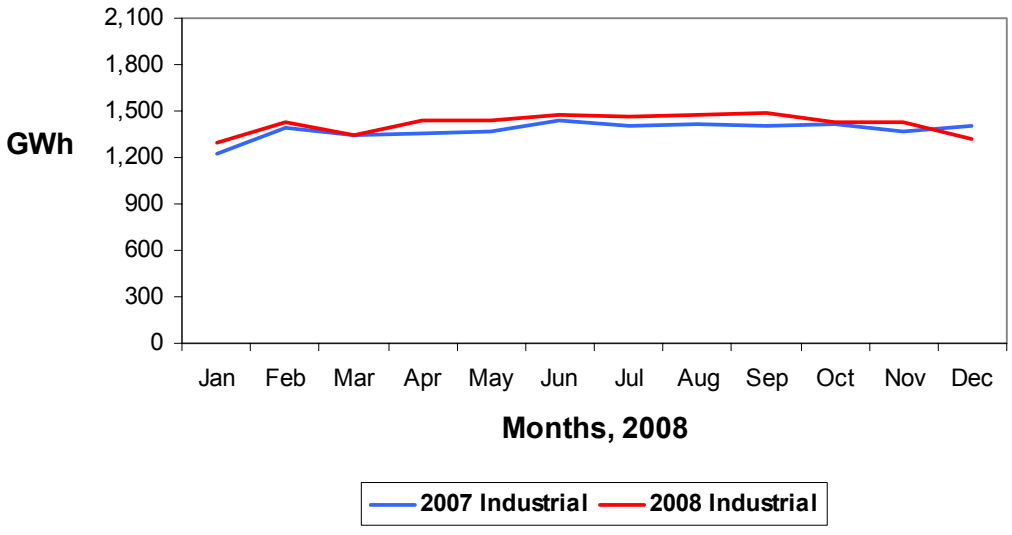
Fig. 1-7: 2008 Electricity Consumption, 60,821GWh



Industrial Sector

Electricity sales to the industrial sector accounted for 34.61 percent or 17,031 GWh of total electricity sales, 3.08 percent higher than 16,522 GWh in 2007. The increase in electricity sales to the industrial sector in Luzon was 3.02 percent. However, the increase in electricity sales to the industrial sector in the Visayas and Mindanao was only 0.59 and 0.22 percent, respectively. The minimal increased was attributed to food manufacturing and beverages industries.[1] The effect of the global financial crisis on the last quarter of 2008 affected the performance of export oriented industries such as finished electrical machinery, semiconductors and electric microcircuits. They either closed/shutdown their operations or decreased their loads which resulted in suppress electricity sales. (Fig 1-8).

Fig. 1-8: 2008 and 2007 Monthly Electricity Sales, Industrial Sector



[1] NSCB 4th Quarter 2008 National Account-Industry, Posted 29 January 200/ NEDA, Statement of Socio-Economic Planning Full Year 2008 National Income Accounts

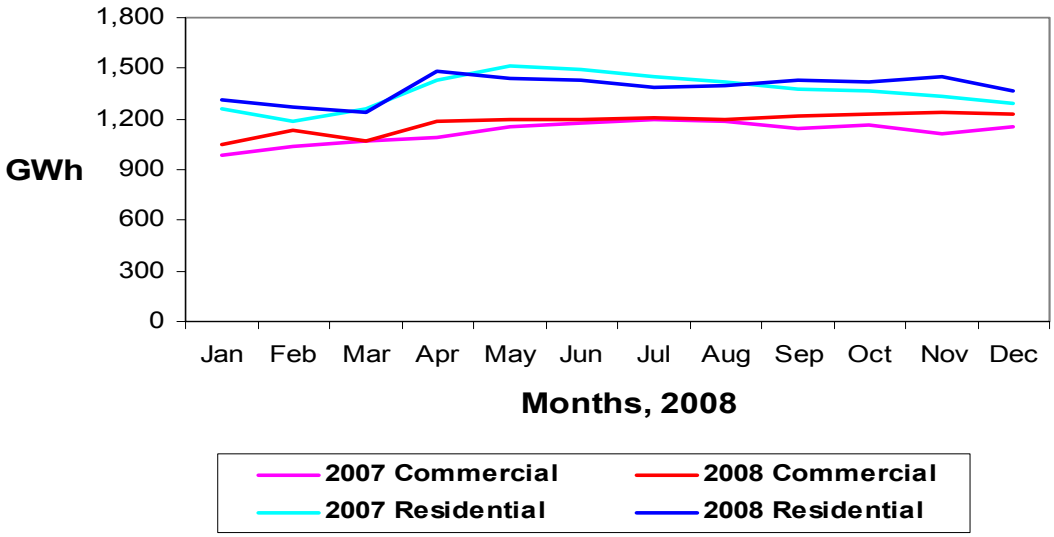
Residential Sector

Electricity sales to the residential sector amounts to 16,644 GWh or 33.83 percent of the total electricity sales. Such sales increased by only 1.64 percent from 16,376 GWh in 2007. Specifically, . Luzon grid posted only 0.88 percent increased, from 12,129 GWh in 2007 to 12,236 GWh in 2008. With rains and typhoons during summer months which resulted in lower temperature, the use of cooling system was reduced throughout the region. Electricity sales in the Visayas and Mindanao grid increased by 2.36 and 5.33 percent, respectively. Highest electricity sales in the Visayas and Mindanao grid occurred in the latter part of the year due to the Christmas holiday season.

Commercial Sector

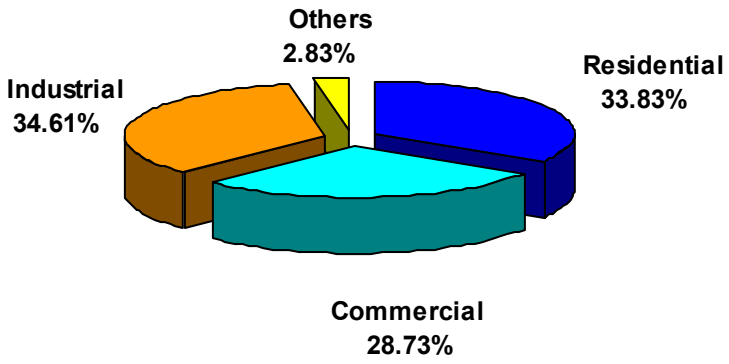
Of the entire sector consuming electricity, commercial sector posted the highest increase by 4.94 percent. For the past five years, average annual growth rate of electricity sales to the commercial sector recorded at 4.95 percent as compared to residential and industrial sectors at 1.64 percent and 2.34 percent, respectively. Electricity sales to the commercial sector in 2008 increased by 4.89 percent (Luzon), 4.11 percent (Visayas) and 6.42 percent (Mindanao) compared to previous year . The growth of personal services such as recreational services, hotels and restaurant and other services to the Gross Domestic Product (GDP) and the increasing commercial building due to continuing demand for office space justified the increased of electricity sales to the commercial sector.

Fig. 1-9: 2008 and 2007 Monthly Electricity Sales, Residential and Commercial Sector



Others uses such as public buildings, street lights, irrigation and "others not elsewhere classified" decreased by 15.1 percent, from 1,641 GWh in 2007 to 1,395 GWh in 2008 (See Fig 2-1, Total Sales by Sector).

Fig. 2-1: 2008 Electricity Sales by Sector, 49,206 GWh



SYSTEM PEAK DEMAND

Historically, annual peak demand in Luzon occurs in May. However, this trend did not occur as early rains and typhoon brought down the temperature at an average of 27.96˚C during month of May. Lower temperatures may have resulted in reduced use of cooling system throughout the region. Peak demand was recorded in 4 June 2008 at 6,674 MW, where the temperature was higher at 35˚C. Peak demand in Luzon grid increased by only 0.47 percent compared to previous year, for the past five years the average annual growth rate in Luzon is only 1.66 percent.

The peak demand in Visayas grid increased by 6.68 percent in spite of supply problem being experienced particularly in Negros and Panay sub-grid. A total of 7,484 MWh unserved energy was recorded by the System Operator in 2008.

Peak demand in Mindanao historically occurs in November or December. With the global financial crisis in 2008, some large industrial customers in Mindanao decreased their electricity consumption. Global Steelworks International Inc. which had an average demand of 38.03 MW decreased their load to 9.31 MW in November and 4.57 MW in December. Maria Christina Chemical Ind., which had an average demand of 7.67 MW, shutdown its operations in the last quarter of 2008. These events decreased the demand in Mindanao grid by 3.04 percent, from 1,241 MW in 2007 to 1,204 MW in 2008 (Fig 1-7).

Fig. 1-7: 2008 and 2007 Comparative Demand by grid

GRID	2008 (MW)	2007 (MW)	Difference	
			MW	%
Luzon	6,674	6,643	31	0.47
Visayas	1,176	1,102	74	6.68
Mindanao	1,204	1,241	(38)	(3.04)
Total Philippines	9,054	8,987	67	0.75