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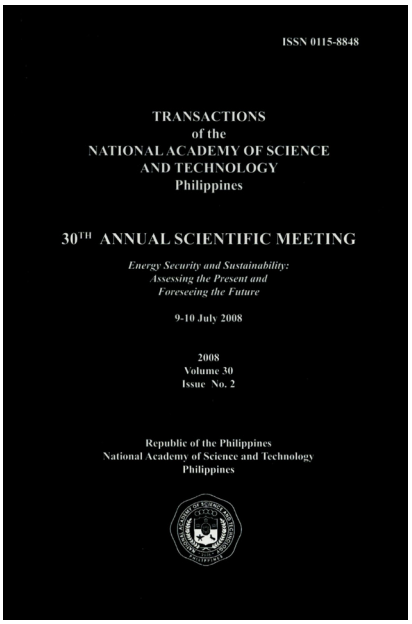

Oil, Gas, and Coal: Today and Beyond

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Other Energy Sources and Technology

OIL, GAS AND COAL: TODAY AND BEYOND

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Introduction

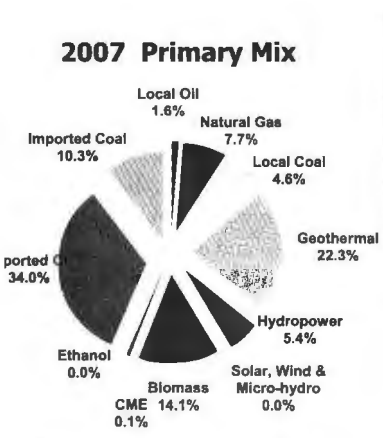
The paper serves to impart knowledge on oil, gas and coal energy resources – the supply potential, utilization and future developments in the light of energy sustainability. Energy is such a critical commodity whereby economic growth and development are anchored, it is a very opportune time to discuss the sustainability of energy supply. In this day and age where borders are opening up for global competitiveness, a country must have sufficient power for the requirements to meet standards and propel attendant activities. Social dimension of the demand for energy is the requirement for the economic and social activities of the people, for the alleviation of poverty and improvement of social equity. In addressing the energy demand, the country's energy choices reflect its environmental priorities. The content of this paper is largely culled from the presentations made in the Philippine Energy Plan Consultation road show of the Department.

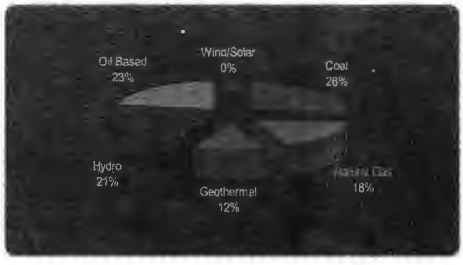
Energy Situationer

Focus on Oil, Gas and Coal

The energy situationer provides the information on the shares of various energy sources in the supply for the economy's day to day energy requirements be it for power and non-power use and is shown in the energy mix. The mix factors both locally produced and imported fuels. In 2007, our energy mix reached a self-sufficiency level of 55.7 % with oil, coal and natural gas being the first, second and fourth main sources. Imported oil accounts for 34 percent share in the supply mix largely due to the demand by the transport sector. The share of natural gas stood at 7.7 percent while the share of coal reached 14.9 percent, majority of which is sourced through importation. In terms of importation, the share of imported oil and coal accounts for 44.3 percent in the supply mix. The 2007 mix shows 1.6% increase in consumption of the local coal and 1.2 % increase in the consumption of natural gas to compensate for the corresponding decrease in the consumption of geothermal and hydropower compared to the 2006 energy mix.

Specifically showing the share of energy sources in power generation is the power generation mix. The 2007 mix shows natural gas as the biggest fuel supplier in power generation at 32% followed by coal at 28%. Oil consumption for power generation has greatly diminished since the country stopped putting up new oil-fired power plants and old such power plants come into retirement. Oil is second smallest fuel supplier in power generation contributing around 9% of the power mix. The mix translates to 66% self-sufficiency level in power generation.





2007 Capacity Mix

Oil and Gas

On the supply side, oil is largely imported. Only 1.6% of the total oil demand in the energy mix is supplied by local oil production.

Local oil production dates as far back as 1979 with the first oil discovery of commercial quantity in Nido, Northwest Palawan by the Citiservice, Inc. The level of production was maintained more or less through the years, the number of oil producing fields increased to six in 1988 but in relatively small proportions. To date, oil production is sustained at greatly reduced volume of an average of 250 barrels per day in Matinloc and Nido still in the waters of Palawan.

Exploration efforts for both oil and natural gas continue in the different sedimentary basins identified in the country but most of these activities are within the waters around Palawan and near Borneo.

Generally, the oil production in the country is on downtrend due to the unsuccessful exploration campaign in the last ten years.

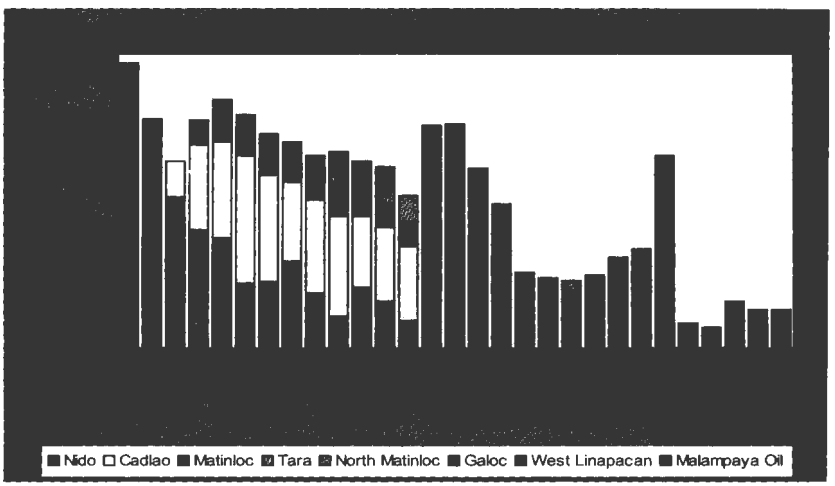
On the downstream side, as mentioned, oil dominates the energy mix largely because of the requirements from the transport sector which is at 60% of the total oil demand. Currently, the industry has a total of 861 players in

the various downstream activities ranging from crude oil transport from the production site to the different bulk plants/depots or endusers through tankers/ barges, pipeline (from Shell/Caltex in Batangas to Manila), to the retail outlets. It is important to note that we only have 2 oil refineries and 75%of the oil supply is imported.

The petroleum product consumption in 2007 can be broken down as follows: diesel at 38.0 %, premium gasoline at 18%, LPG at 11 %, regular gasoline at 5%, avturbo or jet fuel at 9%, and kerosene at 2%. Petroleum product consumption in Luzon consumes 75% of the total petroleum inventory. The National Capital Region has the biggest oil demand at 42 % followed by North Luzon at 18% and South Luzon at 15%. The Visayas region consumes 13% and Mindanao 12% of the petroleum products. Petron, Chevron and Shell dominate the oil market supplying 84% of the demand while other industry players supplies the remaining 16% of the market. The liquefied petroleum gas or LPG is imported used both for transport and residential/commercial purposes. We now have 12,000 Auto-LPG taxis converted and 19 government-accredited conversion shops operating nationwide.

Natural Gas and Condensates

The first gas production in the country was in 1994 when PNOC-Exploration Corporation commenced the production of natural gas for power generation from San Antonio field in Echague, Isabela under SC 37. Initial annual production of natural gas from the field totaled to about 195 million cubic feet, in which the electricity generated was supplied to seven (7) municipalities of Isabela. At present, the gas field has been producing water along with the gas and its use for other purposes such as fuel for motorcycle is being evaluated.



The large-scale natural gas production in the country started in 2001 when Malampaya gas field produced natural gas as fuel for power generation specifically to supply the needs of the three (3) power plants: Ilijan, Sta. Rita and San Lorenzo, which have a total generation capacity of about 2,700 MW. The gas field is presently producing natural gas at an average annual rate of 357 million standard cubic feet and to date, has a total cumulative production of about 603 billion standard cubic feet as of end 2007.

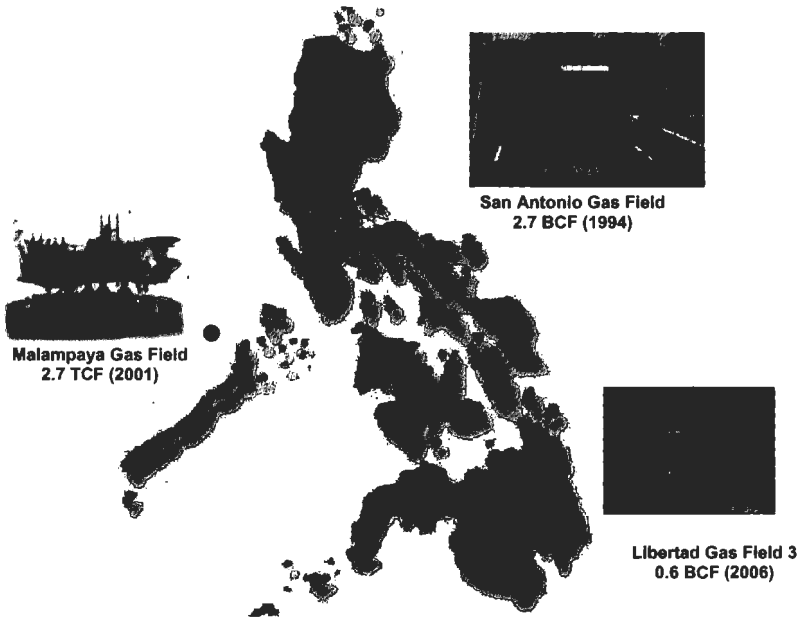
Condensate production from Malampaya that is associated with natural gas totaled to about 29 million barrels or an average rate of 15,000 barrels per day.

Expansion of the use for natural gas is being studied but initial utilization in the transport sector has been implemented. We now have 22 CNG buses plying along Batangas-Laguna-Manila route

Coal

The coal industry started in the country in 1977 and importation begun in 1988. The demand for coal continued to rise over the years such that

EXISTING NATURAL GAS FIELDS

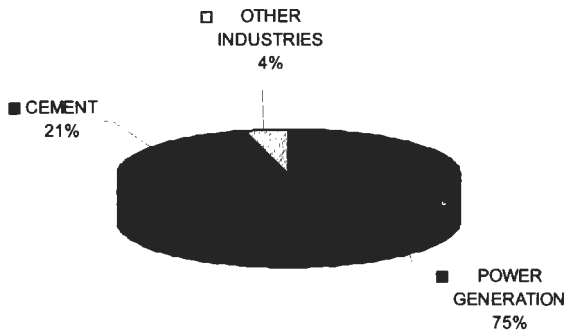


importation outgrew local coal production which had been relatively steady till 2001. The steep demand for energy and the veering away from oil posed the platform for active coal utilization. The continued rise in oil price also gives premium to the availability and cheaper price of coal for fuel considering that environmental mitigations in its use is already in place.

Upstream, for the year 2007, the indigenous coal production hit the 3 million mark at 3.75 million metric tons (MMT) run-of-mine coal, a 47% increase from 2006 production record. The output is largely attributed to the operations of Semirara Corporation located in Semirara Island in Antique and of PNOC-Exploration Corporation in Zamboanga Sibugay. The rest of the production comes from Cebu, Albay and Negros Provinces. Small-scale coal production accounts for around 3% of the indigenous coal supply. The said production, however, supplies only 37% of the coal demand which was at 10.4 MMT. The volume of coal imported in 2007 is at 7.7 MMT.

The consumption of coal is 75% for power generation, 21% for cement manufacture and the remaining 4% for other industries.

2007 COAL CONSUMPTION BY SECTOR, MM MT



TONNAGE

➢POWER GENERATION	7,823,827 MT
➢CEMENT	2,178,798 MT
➢OTHER INDUSTRIES	446,918 MT

World Reserves

To give a global view on the resources under discussion, below are the estimates of oil, gas and coal reserves worldwide by known institutions in the international energy sector.

- The World Coal Institute as posted on its website estimates that world reserves on oil is good for another 41 years, on gas for 63 years and on coal at 147 years.
- Australian research indicates that world fossil fuel reserves stands at 21% oil, 20% gas and 59% coal

Future Thrusts

In terms of policy support, one of the policy directions is to ensure stable and quality supply of energy which can be carried out by the following:

- Accelerating exploration and development of indigenous oil, gas and coal resources.

  The DOE will continue to promote and further draw investments in the upstream sector through the Philippine Energy Contracting Rounds. Plans are underway for the review of the PECR guidelines to ensure its effectiveness in investments promotion. The government is pushing for more investments to maximize the use of our local energy resources such as oil, gas and coal, which could also provide additional development income for the local community and to the whole country as well. Some of the strategies that are critical in facilitating the flow of foreign investments in the Philippine petroleum sector include: (1) promoting collaborative public-private sector partnerships; (2) streamlining the permitting and licensing process; (3) embarking into an intensive information, education and communication (IEC) campaign to improve the social acceptability of energy exploration and development activities; and (4) the putting up of a one-stop-shop to assist petroleum investors.

  Estimated local reserve of oil is at 43 million barrels, natural gas at 3,772 billion cubic feet and mineable coal reserves at 335 million metric tons.

- To boost the development of the Philippine natural gas industry, the DOE will push for the immediate passage of the downstream Natural Gas Bill which will provide the impetus for the development of strategic infrastructures and expand the use of natural gas in both power and non-power use.

- Pursuance of the Natural Gas Vehicle Program for Public Transport (NGVPPT) is expected to mitigate our dependence on imported oil and eventually impact on the country's economic growth through savings in fuel oil displacement.

Conclusions

- There is continued reliance in oil, gas and coal as energy sources.
- Oil is mainly consumed for the transport sector. Price forecast indicate continuous upward trend.
- Natural gas is consumed for power generation, and expansion of local utilization is yet to be developed e. g. transport
- Coal is still the logical choice to bridge the demand in power generation in view of availability and transportability of supply, and lower price
- Locally, renewed exploration interests on these energy sources are triggered by continued increase in the price of oil. Benefits include:
  ⇒ Exploration companies come to the country to explore
  ⇒ Every exploration activity redounds to additional information
  Achievement of energy self-sufficiency