

Even with improvements in demand management and increased energy efficiency, consumption of hydrocarbons is expected to grow by approximately 5% per annum for the rest of the century. Demand will double to about 80 MTA by the year 2000. It is estimated that based on present reserves the corresponding production levels will stagnate at about 40 MTA or 50% of demand.

Though the total refinery capacity has kept pace with the demand of about 40 MTA the composition of refinery output does not match the composition of demand. There is therefore a shortage of middle distillates, particularly kerosene and diesel, which is met primarily through imports.

The Government of India places a high priority on the need to identify new petroleum resources for the 1990s and beyond. One option now receiving increased attention is the potential substitution of natural gas for liquid petroleum products. The role of Natural Gas is likely to be central to future government planning and expenditure in this sector. Continued high exploration levels and improving yields from present fields will also contribute significantly to the government's plans to reduce its dependence on foreign sources of petroleum.

Exploration—A \$ 4 Billion Commitment

Many areas with petroleum potential are still under-explored. It is estimated that some 50% of expected oil reserves and as much as 75% of expected gas reserves are yet to be tapped. By 1990, the end of the Seventh five year plan, India will have committed about \$ 4 billion to exploration activities during the plan period. The pace and scope of exploratory activity however, has been uneven and finds have been of limited significance since the discovery of the Bombay High Oilfield.

In an effort to expand exploration activities the Government of India has recently entered into a number of exploration agreements with international oil companies. The Soviet Union is engaged in seismic surveys and exploration in the Cambay and Cauvery basins, Chevron-Texaco are carrying out operations in two blocks in the Krishna-Godavari and Palar basins. International Petroleum Corporation and Shell Oil are exploring other blocks in the Krishna-Godavari basin. BHP of Australia has signed an agreement for the Kerala-Konkan basin and Amoco is expected to close an agreement by mid 1988.

The Government of India is committed to an enhanced exploration program and future expenditures are expected to accelerate.

Natural Gas—Bright Prospects

Geological conditions indicate that India likely has more undiscovered gas reserves than oil reserves. To date gas production in India has consisted almost exclusively of gas produced in association with oil. A large proportion of this gas has been flared due to the absence of distribution and transmission infrastructure and lack of markets. In recognition of the vital role gas will play in India's future energy planning the Government of India has established a separate organisation for Natural Gas planning, marketing and distribution—the Gas Authority of India Limited (GAIL).

India's proven and probable gas reserves are estimated to be about 680 billion cubic metres (BCM), equivalent to about 550 MT of oil. Nearly 80% of these reserves are located in the Western offshore region (550 BCM), 10% in the mountainous region of Assam (70 BCM) and the remaining 10% in the Cambay basin of Gujarat (60 BCM). ONGC is producing both free and associated gas from Cambay basin, whereas only associated gas is being produced from the Upper Assam basin. The biggest increase in gas availability during the Seventh Plan has come from the South Bassein Gas field which began production in 1986-87 (20 million cubic metres per day in 1987-88).

The second major discovery made by ONGC is in the Western Region of the Gandhar belt including the Gandhar, Dahej and Pakhajan fields. The present estimated gas production is over 4 million cubic metres per day.

Gas reserve estimates are still being reviewed as evaluation and development of fields proceed. A long-range countrywide demand forecasting exercise for gas has not yet been completed as GAIL is currently undertaking a series of market assessments on a region-by-region basis. Gas consumption will be