

NATURAL GAS TRANSMISSION &  
DISTRIBUTION IN INFRASTRUCTURE  
DEVELOPMENT IN PAKISTAN & ITS  
ROLE IN POWER GENERATION

By

**A. Rashid Lone**

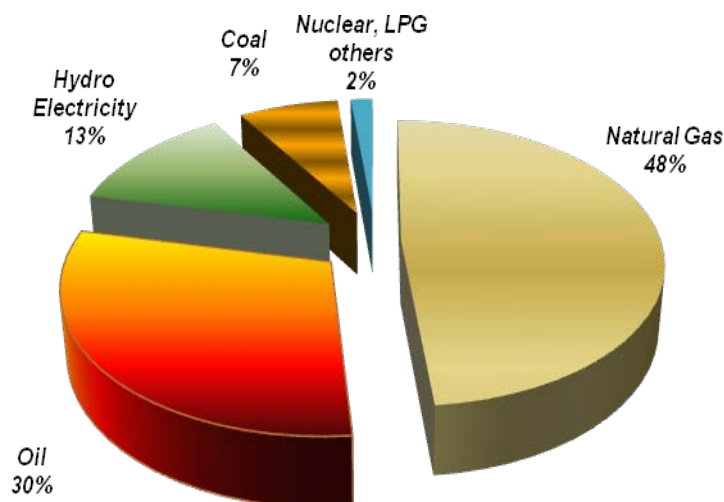


## NATURAL GAS TRANSMISSION & DISTRIBUTION IN INFRASTRUCTURE DEVELOPMENT IN PAKISTAN & ITS ROLE IN POWER GENERATION

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Pakistan is a country, blessed by diversified natural resources. Coal, Oil, Gas, Minerals, Stones and a number of other categories of ores are scattered in the wildernesses of Province Baluchistan, in the mountains of Province NWFP, in the planes of Province Punjab and in the rich basin of Indus. The country started from oil and coal as pre-dominant energy sources and soon switched to Hydral Power after construction of huge Hydral Power Projects and then after the discovery of Natural gas, the table was turned around. Today the natural gas claims one half of the share of energy market of the country and the economy seems to be revolving around it. The agriculture based economy of the country relies on availability of indigenously synthesized fertilizers manufactured from Natural gas, the turbines of power houses burn natural gas to run the wheel of industry, General Industry of the country fires this flexible fuel for boilers and heaters, the stove of common man is dependent on this gas and also the car of a mediocre person needs its fueling as CNG. In all these sectors these Natural Gas is serving the nation and bearing the major load of economy.

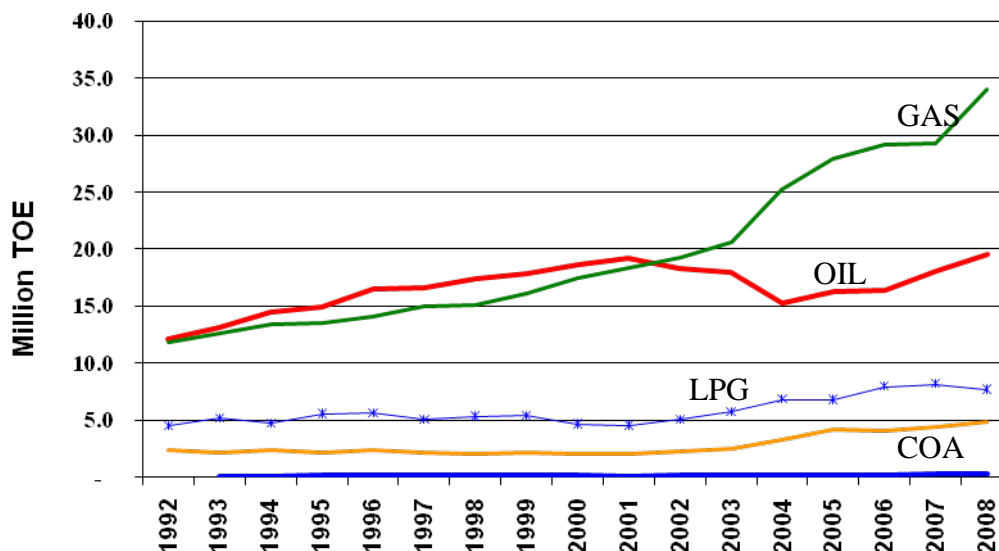


**PAKISTAN ENERGY SUPPLY MIX 2007**

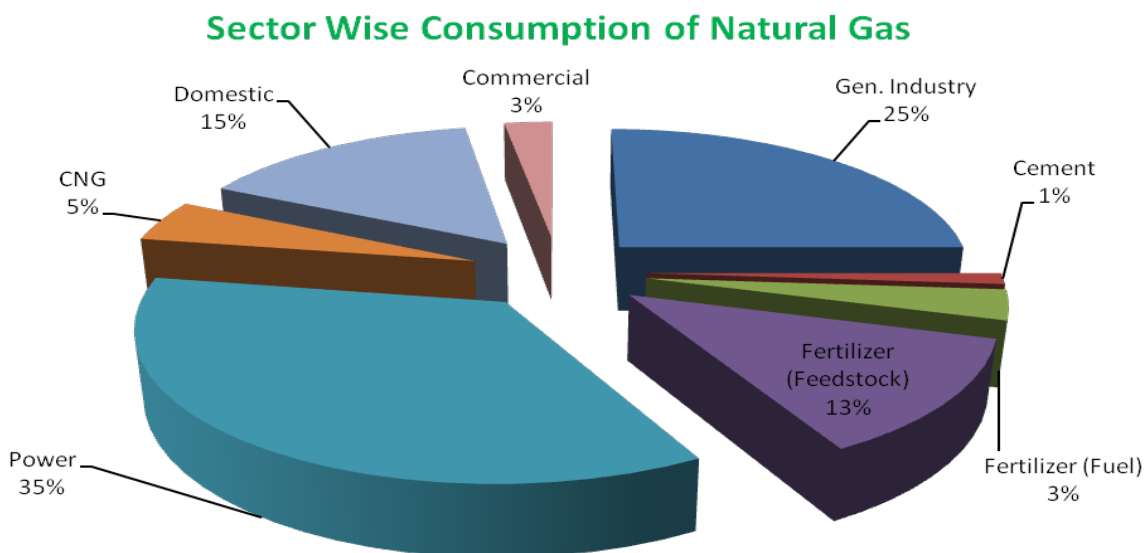
The study of the energy supply mix of the country from 1992 to 2007 clearly indicates that the shift is towards the Natural Gas due to ease of combustion and cheaper price as compared to other domestic / industrial fuels.

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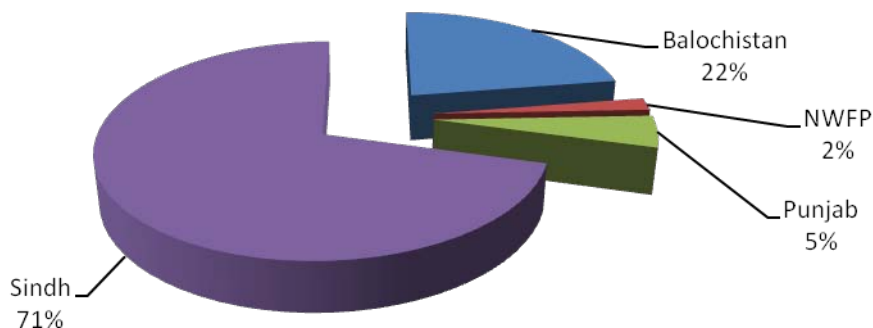


The country offers huge oil and gas potential and vast relatively unexplored acreage, with historical exploration success ratio of 1:3.4. Natural gas was first discovered in 1952 at Sui in Balochistan province which proved the most significant and the largest gas reservoir. After successful exploration and extraction, it was brought to service in 1955. This major discovery at Sui followed a number of medium and small size gas fields in other part of the country. A normalized estimate of Natural gas reserves of Pakistan at 900 BTU/Cu.ft. is around 28.18 Trillion Cubic Feet (TCF) while the natural gas production during the year 2006-2007 was around 3.873 Billion CFT/Day. This consumption pattern of this Gas in different sectors of economy is as under:



All the four provinces have their contribution in the production of Natural Gas for the country. The province wise breakup of the production of Natural gas for the year 2006-07 is as under:

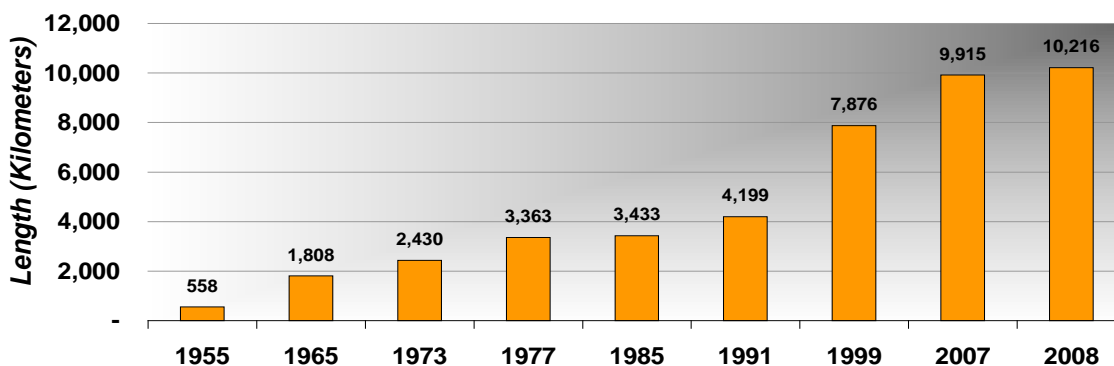
### Province Wise Share in Gas Production 2007



In 1964 an average daily sale of Natural Gas in Pakistan was around 47 MMCFD Day which presently goes as high as 3800 MMCFD. While fully recognizing the dynamics of the rapidly changing global energy scenario, the country has put strenuous efforts to establish and technological empowerment of a strong infrastructure for upstream as well as for downstream activities. Presently country has more than 10200 Kms. of Transmission Pipelines of diameters upto 36 inch and being operated at pressures as high as 1260 Psi bringing gas from far flung gas sources to the consumption centers. And further trough a distribution network of around 90,000 Kms., this gas is being served to more than Five Million valued customers.

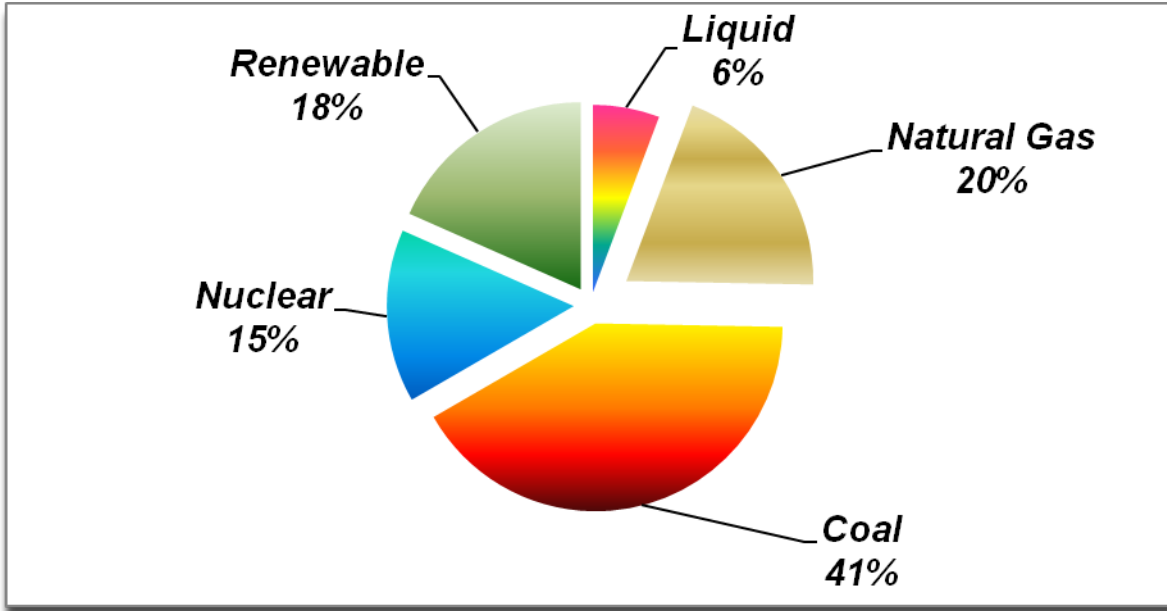
	SNGPL	SSGCL	TOTAL
<b>Transmission (Kms)</b>	<b>7,016</b>	<b>3,200</b>	<b>10,216</b>
<b>Distribution (Kms)</b>	<b>59,951</b>	<b>29,832</b>	<b>89,783</b>
<b>Compression (HP)</b>	<b>185,000</b>	<b>62,900</b>	<b>247,900</b>
<b>Towns Connected (Nos.)</b>	<b>1,297</b>	<b>1,127</b>	<b>2,424</b>
<b>Number of Consumers (Millions)</b>	<b>3.19</b>	<b>1.90</b>	<b>5.09</b>

The Transmission and Distribution Networks have faced phenomenal growth in last few years owing towards rapid increase in the customers of gas.



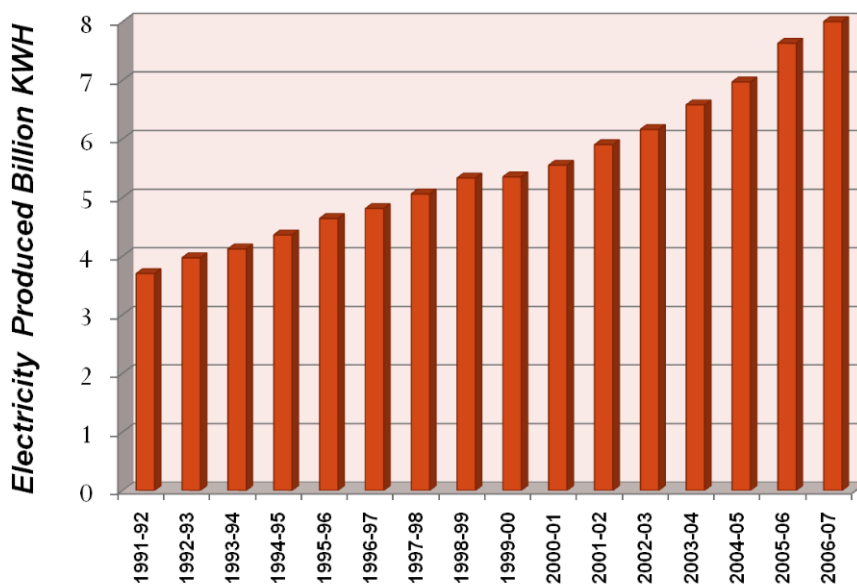
**TRANSMISSION NETWORK GROWTH 1955 TO 2008**

In the year 2007, the total Power generated of the world was around 17.3 Trillion Kilowatthours however an annual increase of 2.6% is expected in the coming years. The world power requirement is estimated to be around 33.3 Trillion Kilowatthours by the year 2030. No doubt the electricity is the fastest growing form of energy in the world while for generation of this electricity, the fastest growing fuel is Natural Gas. Internationally around 41% power is being generated by Coal.



**SHARE OF DIFFERENT FUELS IN POWER GENERATION (WORLD-WIDE, 2007)**

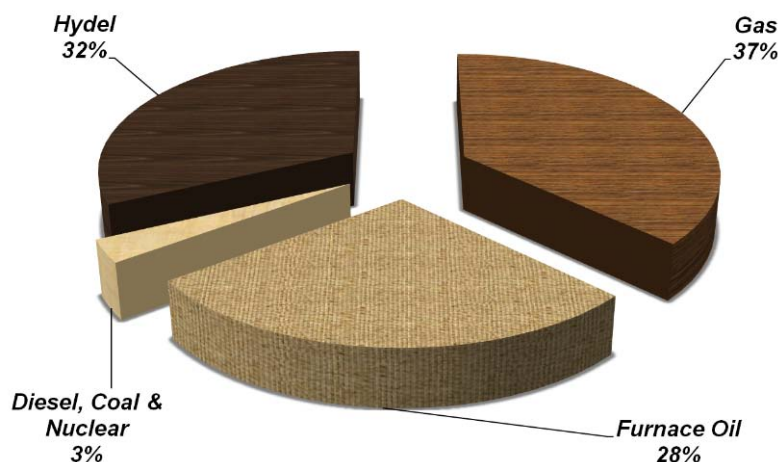
However Natural Gas is becoming the fuel of choice for Power Generation due to its availability, Environment friendly nature and high efficiency of latest gas turbine based combined cycle equipments. The Power Generation is also increasing in Pakistan and it has almost doubled from 1992 to 2007.



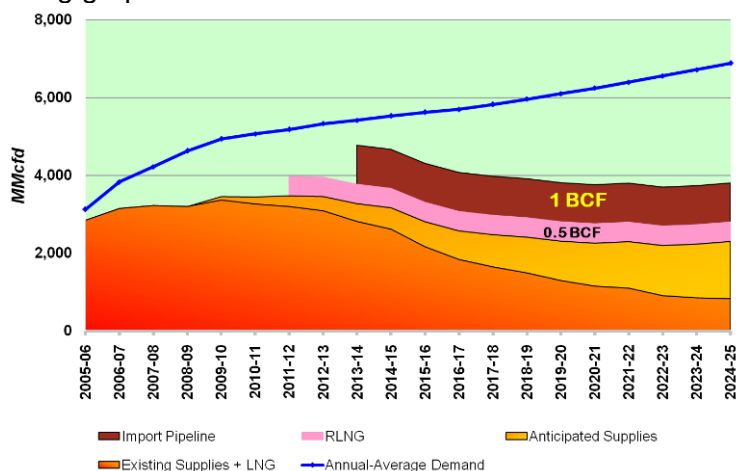
This entire infrastructure falls under two Gas Companies of the country i.e. M/S. Sui Northern Gas Pipelines Ltd. (SNGPL), and M/S. Sui Southern Gas Company Ltd. (SSGC). Both of these companies have major share holding of Government of Pakistan and operate under regulatory environment established by the Government. Two provinces i.e. NWFP and Punjab fall under area of operation of SNGPL while rest of the two i.e. Balochistan and Sindh are served by SSGC. Unlike most of other countries, both of these Gas Utility companies are Integrated Gas Transmission and distribution companies having full fledge capacity of laying Gas pipelines in all geographical topographies. All of the pipeline networks are cathodically protected. These gas companies have in house arrangements for all natures of specialized pipeline operation i.e. In-Service Welding, Hot Tapping, Stopple Plugging Operations, On-stream Pigging etc. These companies are also involved in Field coating / Re-habilitation of pipelines, Fusion Bonded Epoxy and P.E. Coating of Linepipe at Coating Plant, Designing, development and installation of CP systems, Manufacture of gas meters and a number of other value addition activities. The gas companies of Pakistan also offer following services to other

**GROWTH OF POWER GENERATION IN PAKISTAN 1992 TO 2007**

This power generation involves around 37% Natural Gas as a fuel while Hydral Power is at second position with a contribution of around 32%.



A projection of total gas inputs, demand and committed sales of M/S. SNGPL has been shown in following graph:



Pakistan's Gas Demand and Supply Projections indicate a widening gap of approximately 1700 MMCFD by the year 2010. Any commitments of additional gas supplies to industries, power or fertilizer plants on a long term basis are therefore not possible, without confirmation of additional sources of gas supply. This may be possible through an import gas pipeline which shall take at least 4 to 6 years to supply gas. To cover this gap an alternate is the LNG import option which by current assessment will be able to provide gas by the year 2010/11 for which the planning of 3.5 million tons per annum (MTPA i.e. around 500 MMCFD) LNG import project with a re-gasification facility to be located in the vicinity of Karachi, the port city of Pakistan is under way. Government of Pakistan has already issued LNG policy in 2006 and has offered several incentives for LNG import through this policy.

Besides LNG project, the gas import projects are also moving forward but at a slower pace. The geographical, technical, economical and political factors are shaping the projects and hindering the progress. However Pakistan has an excellent potential for foreign investment in any Gas import related project, as the country has a consistent increasing demand for gas and the utilization of existing gas infrastructure to distribute this gas shall maximize the profits.

## **CONCLUSION**

Pakistan has dependable and extremely efficient gas Transmission and Distribution networks belonging to two gas companies operating in the country. However, in order to meet the shortfall of gas for power generation and other industrial usage, it is imperative that gas should be imported on fast track basis either through Iran-Pakistan-India (IPI)/Turkmenistan-Afghanistan-Pakistan (TAP) or LNG. There is an urgent need for improvement in exploration activities and for increase in indigenous gas production.

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4. Data from Sales & Transmission Department M/S. Sui Northern Gas Pipelines Ltd. Till June, 2008
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