

Development of natural gas as a vehicular fuel in Pakistan: Issues and prospects



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ABSTRACT

In a step towards adopting environment friendly fuel and to save foreign exchange, Compressed Natural Gas (CNG) was introduced by the Government of Pakistan in the country in 1992. Due to available price differential between CNG and gasoline/diesel and investor friendly policy and regulatory framework, CNG sector has shown tremendous growth over the last ten year in the country. This growing demand of natural gas by CNG sector, results in gas shortages in the country. This paper describes the key steps in the development of CNG as transportation fuel in Pakistan. The present scenario of the CNG industry including the natural gas vehicles (NGVs) population growth and the expansion of CNG refilling stations are discussed. Various aspects of the CNG program in Pakistan, for example environmental benefits, economic benefits and problems associated with CNG industry of Pakistan are illustrated.

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1. Introduction

The word is turning to replace gasoline and petroleum based energy, which is showing a rising trend in price. Around the world a widespread research is carried out to investigate that CNG is good for the customer and kind to the environment, while making the country into more fuel sovereign state. A growing number of countries around the world are jumping on the moving train to make use of CNG, because of various advantages. The entire credit for this goes to New Zealand, which in 1980s launched CNG programs on a commercial scale successfully. It seen that CNG is the answer to the world, in the hunt for alternative transportation fuel. Today CNG programs are being pursued in more than 86 countries and Pakistan stands 2nd in the world tally in terms of NGVs (1st Iran) & fillings stations (1st China) ([Statistics and Europe, 2013](#)).

2. Background CNG program in Pakistan

The foundation-stone of CNG program in Pakistan was laid down by HDIP (Hydrocarbon Development Institute of Pakistan)

through the establishment of CNG refilling stations at Karachi in 1982. In 1992, Ministry of Petroleum and Natural Resources of Pakistan, announced the CNG Rules of 1992, which commercialized CNG as a transportation fuel in the country. The program really picked up in 1998 when the government declared a two year goal of establishing 150 CNG stations and conversion of 100,000 vehicles.

Keeping in view the lack of domestic fuels, a large space always existed in the country for the development of alternative transportation fuels, particularly natural gas, which is locally available at a low cost, while a widespread infrastructure for transmission and distribution of natural gas is already in position.

3. Statistics of Pakistan's CNG industry

Due to Government's consumer friendly policy, ample regulatory framework and extensive efforts, CNG industry has developed significantly at an unprecedented rate of around 52.5% per annum during the last few years. Currently the country has 6.167 million total number of register vehicles ([Pakistan National, 2010](#)), out of which there are 3,100,167 (89%) vehicle has been running on CNG while the rest, which includes buses, trucks, and two wheelers, three wheelers etc, are using gasoline and diesel. [Table 1](#) depicts the statistical highlight of natural gas vehicles – NGVs in Pakistan.

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Table: 1

Statistics of Pakistan's CNG industry (Statistics and Europe, 2013).

Total NGV population (other than ships, trains and aircraft)						CNG stations		Date
Total NGVs	LD + MD + HD Vehicles	LD Vehicles	MD + HD Buses	Other	% of total vehicles in the country	% of total NGVs worldwide	Total % of total CNG stations worldwide	
3,100,167	2,920,167	2,919,500	667	180,000	89.14%	19.12%	3330 15.84%	March, 2012

4. Prevailing status of CNG in Pakistan

Because of higher priority and the insatiable demand for natural gas by power plants and industry, the government has to ration natural gas for CNG sector. It often announces “gas holidays” where gas supply to CNG stations is cut off for several days a week, conducting to widespread dissatisfaction among CNG consumers. Owing to these gas shortage problems, the government is not in favor of further expansion of CNG sector in the country. The officials are struggling with the difficult task of trying to turn back the strategy and to ablate vehicles back onto gasoline to divert the natural gas to industry and power plants. Recently the government, without consulting the stake holders, imposed ban on import of CNG Kits and CNG Cylinders and has restricted the OEM companies i.e. Pak Suzuki Motor Company, Indus Motors Company (Toyota) and also after-market installers to stop conversion of vehicles to CNG.

To rationalize the gas consumption, a load plan in October 2010 has been implemented. Under the plan, gas feeding to the CNG stations was curtailed to five days a week in certain regions of the country. The main reason behind failure of gas energy plans and policies in Pakistan is political disability, as a result of which policies of previous governments have been destabilized by preceding governments.

5. Growth of CNG in the country

The CNG industry in Pakistan has witnessed a tremendous growth in the last decade, by virtue of friendly government policies and the key role played by CNG station/vehicle owners. At present, it stands 1st in the world. Figs. 1 and 2 reflect the continuous increase in the number CNG stations and CNG vehicles respectively. A significant increase has also been seen in the consumption of natural gas by CNG sector as shown Fig. 3. Over the past ten years (2001–2010) there is more than 11, 000 percent raise in gas

consumption by this sector. Currently CNG industry consumes 325 MMSCFD (million standard cubic feet per day) natural gas (9% of country gas production) (Pakistan Energy, 2013).

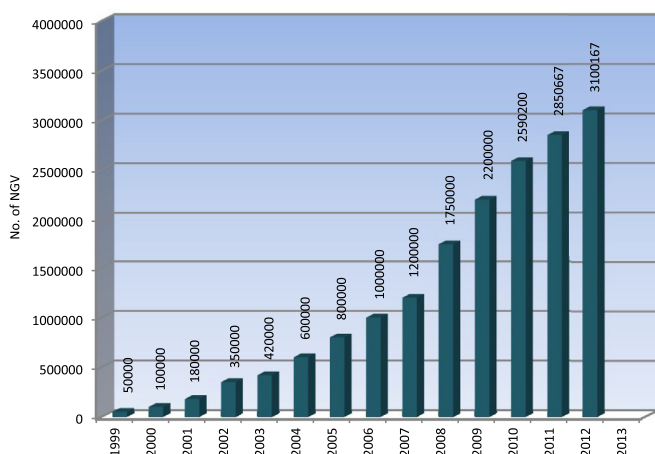
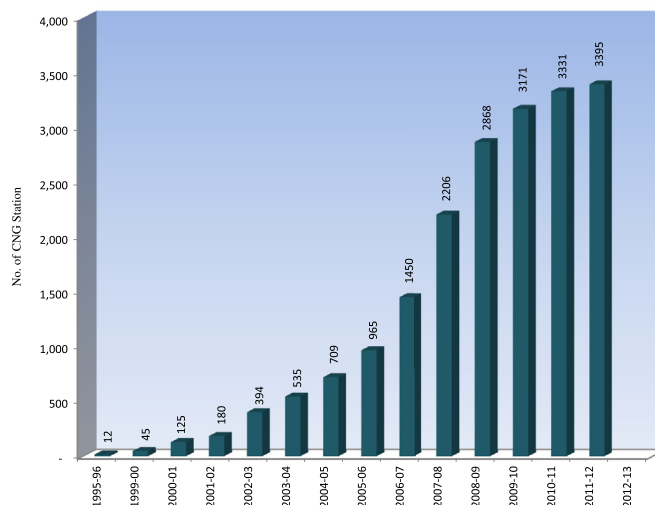
6. Government policy & support

Pakistan has sought ways to raise awareness, investment, technology and institutional framework, while pursuing fast track development of the CNG industry. Government's interest to boost national economy by reducing oil import bill and improving the environment has led to the provision of incentives for investors in CNG sector. Some of them are highlighted below:

- Exemption from import duty and GST for CNG station and vehicle conversion equipment for a period of five years
- Permit import of used and reconditioned CNG compressor.
- Loans on soft terms to setup a CNG station
- Strong commitment by the government to promote the use of CNG
- Liberal procedures for issuance of license for setup a CNG stations.
- Deregulated market price for CNG consumers
- Natural gas tariff for CNG coupled to gasoline
- Gas connection priority to CNG stations

7. Natural gas scenario in Pakistan

Pakistan is an energy deficit country. The country primary energy supply during the financial year 2011–12 was recorded as 64.7 MTOE (million tons of oil equivalent) (Pakistan Energy, 2013) and it is majorly depends upon imported petroleum products, as a result of which the country's annual oil import crossed the limit of

**Fig. 1.** CNG vehicle growth in Pakistan.**Fig. 2.** Growth of CNG filling Station in Pakistan.

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