

CNG, An Environment Friendly Transport Fuel: Success Story of Pakistan

The Global Leader in CNG Use

**BAQ Workshop, November 11. 2008, Bangkok,
Thailand**

**Hilal A. Raza
Director General and CEO**

**Nasreen Farah
Principal Scientific Officer**

HYDROCARBON DEVELOPMENT INSTITUTE OF PAKISTAN

LAYOUT

- 1. Introduction**
- 2. CNG in Global Perspective**
- 3. CNG in Pakistan**
 - i. Situation before the Initiative**
 - ii. CNG Rules and Policy incentives**
 - iii. Institutional Structure**
 - iv. Status of CNG industry in Pakistan**
 - v. Pakistan CNG industry Growth**
 - vi. CNG - Diesel Substitution**
- 4. Exhaust Emission Reduction**
- 5. Results Achieved and Sustainability**

Introduction

- **Alternative Fuels employed in road transport: Compressed Natural Gas (CNG), Liquefied Petroleum Gas (LPG), Methanol and Blended/ Ethanol and Electricity.**
- **The main objective to introduce CNG as Transport Fuel in Pakistan was, Natural Gas being an indigenous Energy Resource:**
 - **Lessens the Import Bills**
 - **Availability, Secure Energy Supplies**
 - **Robust Infrastructure**
 - **Energy Security**
 - **Environmentally Cleaner than Liquid Fossil Fuels**

A Global Perspective

- **Compressed Natural Gas was first used as Transport Fuel in Italy in the 1930's**
- **Worldwide average growth rate for the past five years**

Global:	30.6%
Asian industry:	49%
Pakistan's industry:	57% (Fastest in the World)
- **Today more than 70 countries of the world are using over 9 million natural gas vehicles (NGVs)**
- **IANGV's targets 50 million natural gas vehicles on the road globally by 2020**
- **Pakistan has recently emerged as a Global Leader in use of CNG as a transport fuel leaving behind Argentina and Brazil**

CNG in Pakistan

i. Situation before the Initiative:

- **HDIP being the pioneer of CNG in Pakistan established the first CNG station in 1982.**
- **At that time there was no concept of using Natural Gas in Transport sector in the entire South Asia**
- **Therefore, the programme could not get substantial support from Public and the Government.**

CNG in Pakistan

ii. CNG Rules and Policy incentives :

However, strong government commitment, liberal licenses and large domestic resource with established distribution pipeline network played a key to successful CNG policy initiatives.

- **The Pakistan CNG (Production & Marketing) Rules formulated in 1992, simplified the government procedures to facilitate and encourage private investors for investment in the CNG industry.**
- **The subsequent Petroleum Policies of Government (1994, 1997) continued to lay emphasis on promoting CNG use as substitute fuel.**
- **Expedite imports of CNG machinery, equipments including Conversion Kits, CNG Cylinders etc.**

CNG in Pakistan

- Exempted CNG companies from duties and sales tax for a period of five years.
- Eliminated double taxation in the form of excise duty on CNG.
- Exempted custom duty etc. on import of CNG equipment machinery, kits etc.
- Allowed import of used and re-furbished CNG Station equipment (certified by independent third party inspectors).
- Deregulate CNG prices.

Continued.... 2/2

CNG in Pakistan

iii. Institutional Structure

Policy: Ministry of Petroleum & Natural Resources

Regulation: Oil & Gas Regulatory Authority (OGRA)

Technical : Hydrocarbon Development Institute of Pakistan (HDIP)

Status of CNG industry in Pakistan

- **2,500 Operational CNG Stations**
- **1,000 CNG Stations are under construction.**
- **6,000+ Provisional Licenses have been issued by OGRA to establish CNG Station**
- **Over 1.8 Million Vehicles running on CNG**
- **Over US \$ 1.5 Billion investment has been made**
- **Over 60,000 New Jobs have been created**

Continued.... 1/3

Status of CNG industry in Pakistan

- **Local Manufacturing of CNG Equipments**
 - + **Five CNG Conversion Kit Manufacturers**
 - + **Three CNG Mass Flow Digital Dispenser Manufacturers**
- **Dedicated CNG Buses**
 - *Hinopak has started production*
 - *DAEWOO's CNG Bus is under process*
- **Natural Gas Vehicles**
 - **About 400,000 OEM NGVs have been manufactured**
 - **Major producer is Pak Suzuki which produces more than 50% cars as NGVs**

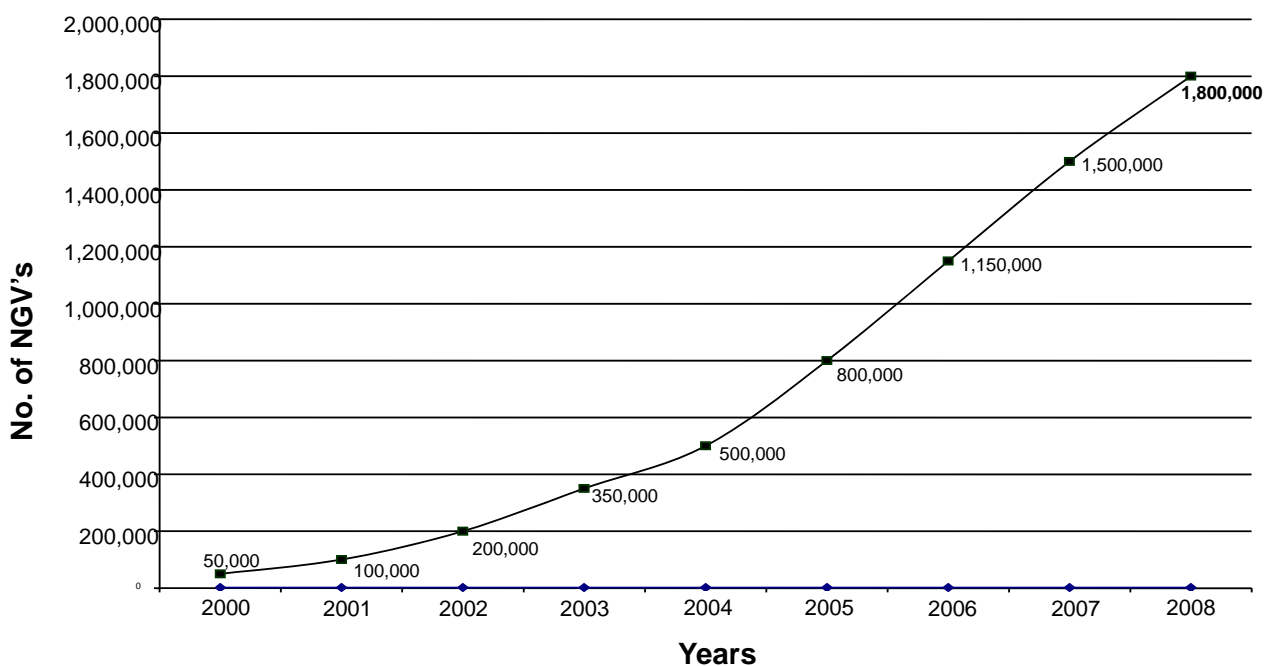
Continued.... 2/3

Status of CNG industry in Pakistan

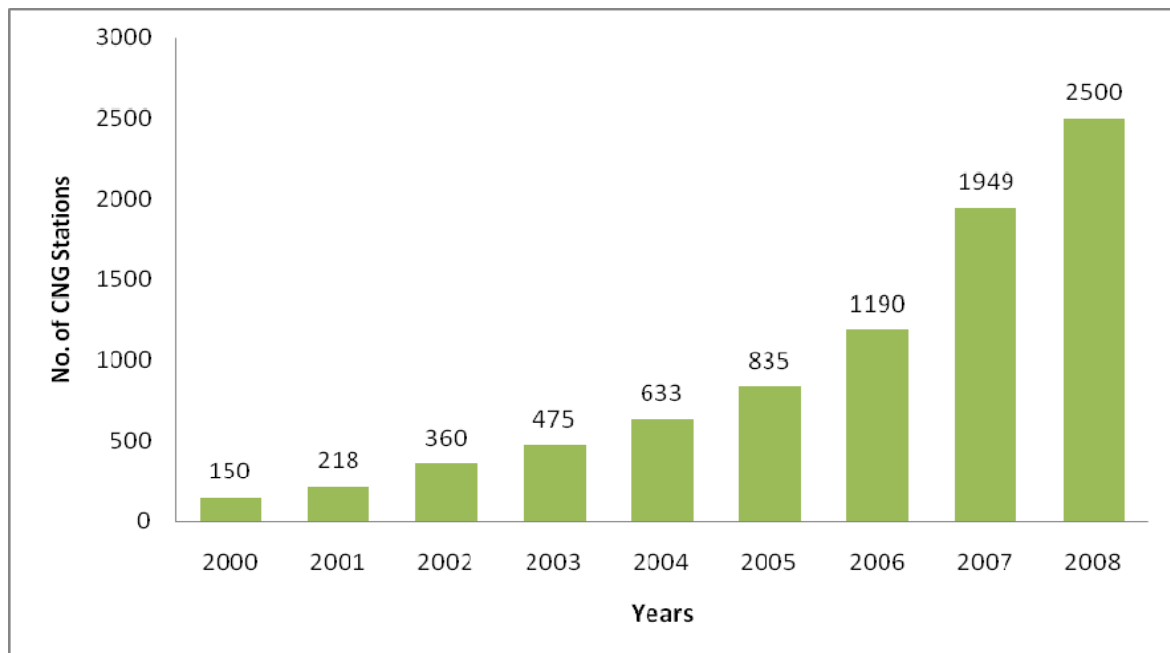
- **Pakistan CNG Rickshaws Project:** started in November 2000 in Quetta. The initial two stoke CNG rickshaws were banned due to noise and harmful emissions. Since 2005-06, four stoke rickshaws are running on CNG. A provincial government is providing loan facility to promote these CNG rickshaws. Five local companies are producing four stoke CNG rickshaws on demand basis.

Continued.... 3/3

Pakistan CNG Industry Growth (NGV's)



Pakistan CNG Industry Growth (CNG Stations)



CNG - Diesel Substitution

The Second Phase of Pakistan's CNG industry is CNG-Diesel Substitution.

- The objective is to phase out diesel buses, wagons and mini- buses in urban areas for better economy and environment.
- Diesel oil is a deficit product for Pakistan. However, the share of CNG: 15%, gasoline: 14 % and diesel is 71% in road transport sector.
- Pakistan imported 4.5 million tones of diesel oil at a cost of about US \$ 3.86 billion(2007-08).
- Therefore Government plans to bring 8000 CNG buses on the roads soon.
- And has earmarked US \$ 64 million under this project.

CNG - Diesel Substitution

- Hence, the Government has planned to establish large CNG Filling Stations and other infrastructure for buses.
- New dedicated CNG buses (CBU) will be exempted from 15% import duty.
- Two Local Bus manufacturers have started production of Dedicated CNG Buses.
 - Dedicated CNG Buses
 - Hinopak has started production
 - DAEWOO's CNG Bus is under process

Continued.... 2/2

Exhaust Emissions Reduction

- For over 1.8 million CNG Vehicles, there is a corresponding decline in emission (kg/km):

<u>Emissions</u>	<u>Kg/km</u>
Carbon dioxide (CO ₂)	200
Carbon monoxide (CO)	4,320
Oxides of Nitrogen (NOx)	3,420
Hydrocarbons (HC)	504
Particulates (PM)	4,284

Continued.... 1/2

Exhaust Emissions Reduction

- CNG use in petrol vehicles has reduced exhaust emissions of:

Carbon dioxide	11%
Carbon monoxide	90%
Unburnt hydrocarbons	50%
Particulate	98%
Lead	100% (at source as compared to gasoline).

- Air Quality will further improve with swapping of diesel to CNG

Continued.... 2/2

Results Achieved and Sustainability

- CNG flourished in Pakistan through policy instruments and consumer choice.
- Over US \$ 1500 million investment has already been made and about US \$ 500 million is expected over the next five years

Continued.... 1/2

Results Achieved and Sustainability

The CNG is a fuel of choice. It is no more an alternate fuel but a preferred fuel. It is clean, cheap and abundant. International forums like the United Nations Commission on Sustainable Development have accepted it as a policy option to address air pollution which is major threat to human health and environment that needs to be addressed in an integrated manner at the national, regional and international levels

Continued.... 2/2

Thank You