The New Delhi CNG Experience

based on a visit in February 2005

What can be achieved if you put your mind to it…

John Baldwin
President, SBGI
Director, NGVA
18 October 2005
Why move to CNG?

- The Taj Mahal was crumbling due to atmospheric pollution from industrial emissions in Agra.
- High levels of pollution from Transport in Delhi and Mumbai.
- Natural gas was available, there was no other practical option.
  - “CNG is estimated to have a cancer potency 80 times less than Indian diesel vehicles and one CNG bus achieves emissions reductions equivalent to removing 85-94 cars from the road.”
- Diesel lobby very anti – quote from diesel advocate.
  “It would be unrealistic to expect that ten thousand buses in the city would ever ply on the roads using CNG as a fuel.”
But what actually caused the move?

- Supreme Court ordered all public transport vehicles to switch over to CNG on 1 April 2001
  - Buses, taxis, auto-rickshaws
  - Transition allowed but only for <8 year old vehicles

Delhi's march towards clean air began with the initiative of one man, a public-spirited lawyer, named Mahesh Chandra Mehta, who had also conducted many other environmental protection campaigns, including saving the Taj Mahal for which he received the 1997 Ramon Magsaysay Award for public service and later on the world's largest grass-roots environmental prize, the Goldman Award.

Mr. Mehta's 1985 petition with the Supreme Court was simple: That the court order the Delhi administration to implement the laws that parliament had passed in 1981.

Though the court ordered the Delhi administration within one year to enforce the law, appeals and other foot-dragging processes of delay snagged compliance. Finally, in 1998, the court acted decisively and set a deadline for change.

It ordered all diesel buses over eight years old to be converted for CNG fuel or be scrapped and, then, turn all public transport buses and auto-rickshaws CNG-driven within about three years.
The start – April fools day 2001

Delhi switch to CNG

One of the most polluted cities in the world -- the Indian capital, Delhi -- has introduced laws aimed at reducing carbon emissions from road traffic.

Starting today, all public transport vehicles -- including buses, taxis and motorised rickshaws -- will have to be converted from diesel to compressed natural gas, or CNG.

The measures were imposed by the Indian Supreme Court which, after protests, conceded that six months' grace would be given to operators provided they had already placed an order for the conversion to CNG.

Offenders risk having their vehicle impounded. The BBC Delhi correspondent says that, because today and tomorrow are public holidays, the full impact of the measures on public transport won't become apparent until Tuesday.

From the newsroom of the BBC World Service.
Delhi diesel’s last stand

India seen more 'receptive' to ULSD/PM filters, CNG monopoly mandate schemes seen faltering - ultra-low-sulfur diesel and diesel particulate filters, possible alternative to compressed natural gas - Brief Article - Statistical Data Included

While India's Supreme Court continues to press for conversion of public transport buses in Delhi from diesel to "clean" compressed natural gas (CNG), there's a "growing awareness" that clean-diesel technology can be an effective (and less costly) alternative to cleaning up air pollution in India.

Among the CNG problems: A 50% shortfall in supply of natural gas to match the CNG vehicle introductions, slow and costly CNG vehicle and refueling station conversions, deadly CNG tank explosions and CNG vehicle fires that have increased in recent months.

CNG Buses Attacked By Diesel Advocates In India (April 25, 2001)

BUSES were being stoned and set on fire in Delhi this week in a sharp escalation of a battle over fuels. The attackers were mostly owners of buses run on highly polluting diesel fuel. The assaulted buses were powered by environmentally friendly compressed natural gas (CNG). Angry crowds deprived of transport joined in the violence. Police fired over their heads to disperse them.

The conflict dates from three years ago, when India's Supreme Court ordered all of Delhi's 12,000 buses to be converted to CNG from diesel, in an attempt to rescue the capital from its plight as one of Asia's most polluted cities. But little progress has been made. The court tried to speed matters up and almost brought Delhi to a stop.
Gas supplies to Delhi
NEW DELHI - The government of Delhi state on Sunday issued a global tender for the supply of 5,000 buses that run on compressed natural gas (CNG) to reduce vehicular pollution in the national capital.

The bids should indicate the price, delivery schedule and a copy of the approval of its prototype from the concerned country, the Delhi state transport authority said in its tender.

It said the last date for receiving bids is March 7.

The government also issued another tender for CNG conversion kits and new CNG engines to retrofit its nearly 10,000 diesel-driven buses.

"The existing buses numbering more than 10,000 which are to be converted are mainly of TELCO and Ashok Leyland," it said. The two firms are India's largest truck and bus engine makers.

The last date for filing a price, delivery and fitment schedule is March 7.

**Story Date:** 27/2/2001

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**New buses from Tata and Ashok Leyland**

**Telco receives orders for 4,590 CNG bus chassis**

Afternoon - April 17, 2001

TATA ENGINEERING has received orders for 4,590 CNG chassis in the National Capital Territory (NCT) of Delhi as of end of March. The Delhi Transport Corporation placed orders for 890 vehicles and private operators accounted for the balance 3,700 vehicles.

The orders for CNG vehicles for the NCT of Delhi have been received subsequent to the orders of the Supreme Court to replace existing diesel buses with CNG.

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DTC orders Ashok Leyland CNG Buses

Date: April 2, 1999. Published from: Corporate Office

A new technological solution to Delhi's air pollution may well be on its way. The Delhi Transport C to induct CNG buses and the initial order for ten CNG-powered Viking chassis has been placed Hinduja Group flagship in India.

Starting with India's first CNG bus in 1997, Ashok Leyland has so far supplied ten CNG buses to some of the buses have successfully completed 2.25 lakh kilometers. The benefits of low emission tremendous: "While it brings down Carbon Monoxide, Hydro Carbons and Nitrogen Oxides in the half, particulates are as low as 15 per cent when compared to diesel engines. CNG may well hold high cost emission control in diesel engines, to meet emission norms of the future", points out Managing Director, Ashok Leyland.
Growth in vehicles and sales
Technical details

- Supply Pressure 19 bar (g)
- Storage Pressure 250 bar (g)
- Vehicle storage pressure 200 bar (g)
- Majority of compressors are gas engine driven (poor elec network)

Mega station

On-line station

Daughter/booster station
CNG business has shown robust growth since FY00

- Increased CNG dispensing stations from 30 to 135 in 4 years
- Presently caters close to 100,000 vehicles in Delhi with sales of 0.90 mn kg/day
  - 15,000 CNG buses!!!
- Contributes 95% to turnover of IGL
  - Remainder gas for domestic use
DELHI receives Clean Cities International Partner of the year award – 2003 from US Dept of Energy
CNG sales in Delhi growing fast

- Passenger car manufacturers introducing CNG variants
- Move to CNG trucks......Supreme Court still loves gas!!

SC tells NCR to switch to CNG

TIMES NEWS NETWORK [FRIDAY, MARCH 11, 2005 11:35:21 PM]

NEW DELHI: Somewhat satisfied with the reduction in Delhi’s air pollution levels, largely due to the use of CNG by heavy vehicles, the SC on Friday saw the need to introduce the green fuel in the entire NCR too.
Reminder - London air pollution

**UK 'will fail pollution targets'**

By Paul Rincon
BBC News Online science staff, at the BA festival

The UK will fail to meet key objectives on reducing air pollution, resulting in further damage to human health, a leading expert has said.

Professor Mike Pilling said levels of nitrogen dioxide, small particles and ozone were too high for official targets for 2005 and 2010.

Air pollution causes several thousand deaths and hospital admissions each year, mainly in the elderly.

Research results are being presented at the BA Festival of Science in Exeter.

The targets set by the government are closely linked to similar limits set by the European Union (EU). Most big EU cities are also likely to fail to make their targets.

**Vehicle emissions**

Professor Pilling, of the Air Quality Strategy group, said London was a particular problem.

"London in particular is going to show [excess levels of] nitrogen dioxide and particulate matter," he explained at the British Association's annual meeting.

A key pollutant, nitrogen dioxide, is formed by the action of sunlight on compounds such as nitric oxide, which is emitted directly from petrol and diesel vehicles.

NOX is very bad for you and **cannot** be removed by particulate filters.
London politicians no different than those in Delhi….

Darren Johnson (AM): I would be grateful for that, and to do some research on the impact that that would have in meeting the target. Secondly, the Fuel Duty Rebate for buses – there is an inbuilt financial bias towards diesel, which mitigates against alternative fuels. Will you be lobbying and will TfL be lobbying to get that changed?

The Mayor: I will talk to Peter Hendy about it, because I am not briefed on that. What I think you are getting at in your question is about CNG. The bad news there is we do not consider it a viable option for the bus fleet, because it does not offer anything additional in terms of environmental benefits that we do not get from the particulate filters that we are fitting.

Mike Tuffrey (AM): You mentioned PM10s, and indeed, I have a question in a moment about that one. Can I just pursue, however, the point of the breach of the EU limitations. Friends of the Earth have said that they are asking the European Commission to prosecute the Government for the breach. The Marylebone Road station is already over that limit – the annual limit. Would you support such a prosecution?

The Mayor: Well, we are in a position where you can breach 35 times, and then the 36th time, it becomes illegal. Now, the 36th time at Marylebone Road happened in May. At no other site in London has this happened yet, and of course, you could sue the Government.

But politicians will tell you it can be!

If they say nothing can be done, remind them of the Delhi experience….

Does this sound familiar?
Mr Mehta………were are you?
and finally, whilst CNG vehicles in India are lower priced than European ones.....

for £2,000... for £6,000
to get the best environmental performance.......
we can take advantage of the German market for cars
and vans...