

Note dieselization of cars and action plan: a brief summary of Supreme Court directives on toxicity of diesel and growing scientific evidence on health impacts of this fuel

November 2012

1. Directives and observations of the Hon'ble Supreme Court on the problem of dieselization of cars in Delhi

In the MC Mehta case the Hon'ble Supreme Court of India has taken serious note of the public health impact of dieselisation and has also issued directions. The concerns over the rising air pollution and toxicity of diesel emissions have been powerful drivers behind the CNG programme in Delhi. In this context, the Environment Pollution (Prevention and Control) Authority (EPCA), appointed under the direction of the Court, from time to time, has made submissions on the status of the problem and the solutions to the Hon'ble Court.

The summary highlights are as follows:

1999: EPCA had submitted report note to the Court on '*Restriction on the plying of diesel driven (private) vehicles in the NCR.*' This report asked for a ban on diesel cars in Delhi based on the emerging public health and science and pollution levels in Delhi. Based on this report, the *Amicus Curiae* filed an application for directions "to forthwith suspend registration of diesel vehicles until further orders."

[The Hon'ble Supreme Court order of April 16, 1999](#) noted the gravity of the situation and took "note of the effects of diesel exhaust on the health of citizen" and sought information about the number of diesel and petrol driven vehicles registered in NCR in 1997 and 1998 and thereafter.

In its report submitted in June 30, 1999, EPCA analysed the details of the particulate pollution problem in Delhi and the risks of diesel exhaust.

These developments lead to court directions of April 29, 1999 that advanced the enforcement of Euro II emissions standards by five years. However, this order, did not anticipate the transition to diesel cars, which would negate its directions to move buses to CNG.

2001: The [Hon'ble Supreme Court vide its order dated March 26, 2001 directed:](#) "During the course of argument, it was contended before us that low sulphur diesel should be regarded as a clean fuel and buses be permitted to run on that. We direct the Bhure Lal Committee to examine this question and permit the parties to submit their written representations to the Committee in this behalf. The Committee may submit a report to this Court in that also indicates as to which fuel can be regarded as 'clean fuel', which does not cause pollution or is otherwise injurious to health".

In July 2001, [EPCA submitted the 'Report on Clean Fuels'](#). The report recommended that hydrocarbon fuels are inherently polluting and hence such fuels cannot be regarded as 'clean fuels' and totally non-injurious to health. The effort should be to constantly improve the fuel and engine technology of automobiles to reduce emissions injurious to human health. However, among these fuels, gaseous fuels -- CNG, LPG and propane -- can be regarded as environmentally acceptable fuels in the NCT of Delhi. After detailed consideration and review of global experiences, EPCA concluded that in the pollution hot spot of Delhi, low sulphur diesel with 0.05 % (500 ppm) sulphur could not be regarded as an environmentally acceptable fuel.

It instead recommended that ultra-low sulphur diesel with 0.001 % sulphur (10 ppm) and low PAH content in combination with after treatment devices like continuously regenerating traps (CRT) could be regarded as environmentally acceptable fuel in the NCT of Delhi. But in addition, it was important that the fuel was not adulterated with low quality diesel or other adulterants. This quality of fuel is still not available in the country.

April 5, 2002 order of the Hon'ble Supreme Court: This order had given a clear strategy to the Delhi government to implement the CNG programme. In this context while upholding the CNG programme the Hon'ble Court had cited reports as in the issue of *Parivesh* of the Central Pollution Control Board citing the following -

““Diesel exhaust has particulate with mass median diameter of 0.05 to 1.00 micrometer, a size rendering them easily respirable and capable of depositing in the airways and alveoli. The particles consist of a carbonaceous core with a large surface area to which various hydrocarbons are absorbed, including carcinogenic polycyclic aromatic hydrocarbons (PAHs) and Nitro-PAHs that have elicited the most concern with respect to human health. The gaseous phase contains various products of combustion and hydrocarbons including some of the PAHs present in the particle phase. Once emitted, components of diesel exhaust undergo atmospheric transformation in ways that may be relevant to human health. For example, nitro-PAHs, created by the reaction of directly emitted PAHs with hydroxyl radicals in the atmosphere can be more potent mutagens and carcinogens and more bioavailable than their precursors. A study undertaken by a Swedish Consultancy, Ecotrafic (Peter Ahlvik and Ake Branberg, 1999) shows that the cancer potency of diesel vehicles is more than two times than that of petrol vehicles in India. But if only the most harmful of the exhaust emissions, that is particulate emission is considered, the carcinogenic effect of one new diesel car is equivalent to 24 petrol cars and 84 new CNG cars on the road.....”

“.....From the aforesaid extracts from the publication of the Central Pollution Control Board, it is evident that there was need to control air pollution, and one of the measures was to reduce the use of diesel. It was with this object in view that the Bhure Lal Committee recommended the use of CNG which was accepted by all the parties including the [Union of India when orders were passed to that effect in July, 1998...](#)”

2004. EPCA on examining the action plans of polluted cities pointed out in its report: [‘The particulate pollution reduction strategy in seven critically polluted cities’](#) while considering mitigation strategies it is not enough to consider only the quantum of pollution but also toxicity of emissions. Literature review shows that diesel vehicles contribute not only considerable amount of particulate from the transport sector but are also most toxic. Diesel particles have already been designated as toxic air contaminant and potential human carcinogen therefore should be minimized as drastically as possible.

With the spectre of increasing pollution in Delhi, it is critical to examine the issue once again. While public transport in Delhi has been effectively kept away from poor quality diesel, it is making a comeback through personal transport and is threatening to nullify the air quality gains. Delhi has phased out 12,000 diesel buses to escape from the lethal effect of toxic diesel particles. But even at a very conservative estimate, the total number of diesel cars in Delhi is equivalent to adding particulate emissions from nearly 30,000 diesel buses.

2007: EPCA in its report on [‘Controlling pollution from the growing number of diesel cars in Delhi’](#) highlighted the key public health concerns over diesel emissions, its key contribution

to the key pollutants of concern, technology lag in vehicle technology and fuel quality, and global best practices to counter the public health risks.

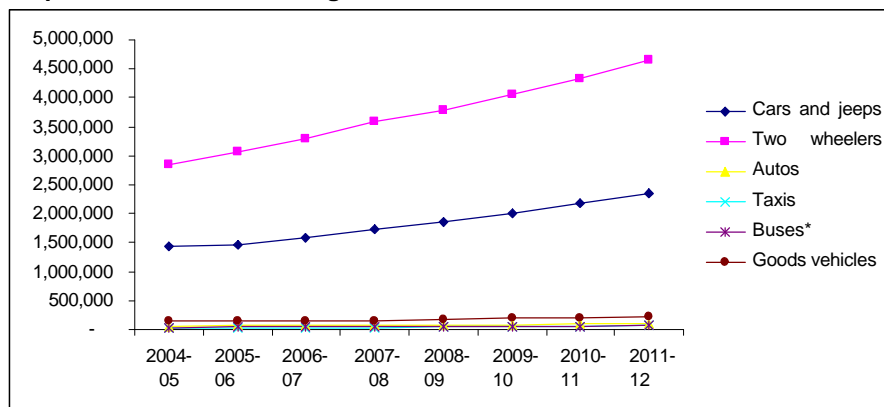
EPCA stated that in view of the serious public health challenge it has repeatedly drawn the attention of the Hon'ble Court to the need for curbing this problem. In 2001, EPCA had stated that only 'clean' diesel technology that runs on diesel fuel with sulphur content less than 10 ppm and is fitted with advanced emissions control devices like particulate traps can be allowed in the city. But even six years later this has not been implemented. But industry has continued to produce intermediate technologies with serious public health consequences. In this circumstance, EPCA has no option but to recommend to the Hon'ble Court, the need to stop the use of diesel in personal transport vehicles in the city of Delhi. This restriction should also be applied to vehicles entering the city from neighbouring states as otherwise, the influx of these vehicles into the city will continue to grow and will negate the gains of pollution control measures.

2. Current status of the diesel problem

2.1. Motorisation and dieselization has continued unchecked: Overall Delhi is now recording explosive increase in vehicle numbers. Since 2005 vehicle registration has increased 1.6 times (Graph 1: Trend in vehicle registration in Delhi). . Only car registration increase has also been as high as that. Last year (2010-2011) about 5,05,449 new vehicles have been added -- close to 1400 vehicles a day. One third of these are cars.

The most rapid increase has been in the share of diesel cars. **In 2000 diesel cars were 4 per cent of the new car sales. This has increased to close to 60 per cent today.** In the more popular compact car models the share is reported to be as high as 70-75 per cent. Huge gap in diesel and petrol prices is inciting this increase.

Graph 1: Trend in vehicle registration in Delhi



Source: [Based on Delhi Statistical Handbook](#)

2.2. Dieselisation is encouraging bigger cars and SUVs. While close to 87 per cent of the new petrol cars sold in 2010-11 had engine size less than 1200 cc, more than 40 per cent of diesel cars were above 1500 cc. Bigger cars burn more fuel and also pollute more.

The Petroleum Planning and Analysis Cell of Ministry of Petroleum and Natural has released a report in October 2012 "[Industry Sales Review Report September 2012](#)" that states that nationally passenger Vehicle sales showed positive growth of 5 per cent, the growth in utility vehicles has been 48.4 per cent and that of multipurpose vehicles 16.7 per cent, which are largely diesel driven. It further states that nationally there has been major drop in 2-wheeler sales largely because of rising petrol prices and economic slow down. Clearly, economic slow down has not affected SUV and utility segment because of cheaper diesel prices.

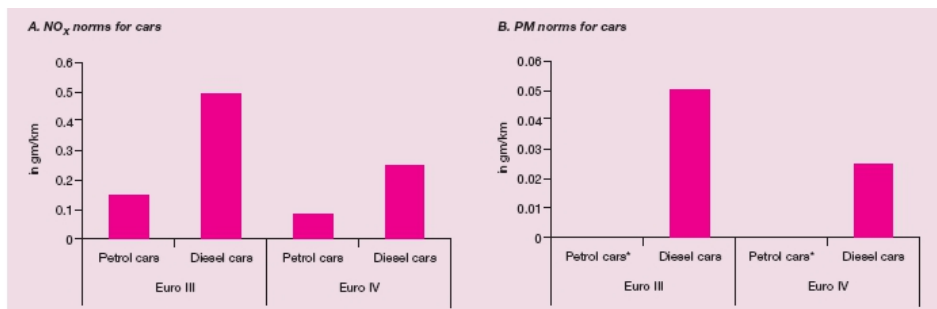
2.3. The explosion of inter-state trips in the NCR region: By 2010, there were 1.2 million vehicles entering and leaving Delhi every day and over 70 per cent of these vehicles were cars. The NCR region - city of Gurgaon, Faridabad and others have grown to be important commercial hubs but have completely inadequate public transport connectivity. This is a phenomenal growth and has greatly contributed to the congestion and pollution in the city and the NCR region. A large part of the vehicles coming from the neighbouring states are diesel run vehicles.

3. Pollution concerns over dieselization

3.1. High exposure to vehicular pollution in Delhi: There is often a tendency to underplay the contribution of vehicles and especially diesel vehicles to the particulate emissions in Delhi on the grounds that there are other bigger sources of particulate pollution. But now new studies have drawn attention to the fact that what matters most for public health is the actual exposure and inhalation of pollution. The health effect study shows that maximum exposure to vehicular fume is up to 500 meters from roadside. As a result, more than 55 per cent of Delhi's population lives in that influence zone. Pollution concentration is 3-4 times higher than the ambient air concentration. This is now increasingly laced with toxic emissions from diesel.

3.2. Diesel cars are legally allowed to emit PM and NO_x - the key pollutants of concern in Delhi's air: The current emission standards of Bharat Stage IV in Delhi and NCR allow higher limits for nitrogen oxides and particulate emissions compared to petrol cars. Diesel cars are 'legally' allowed to emit nearly three times more NO_x and several times more particulates than petrol cars (Graph 2: Comparison of PM and NO_x emissions values for diesel and petrol cars under Bharat Stage III and Bharat Stage IV).

Graph 2: Comparison of PM and NO_x emissions values for diesel and petrol cars under Bharat Stage III and Bharat Stage IV

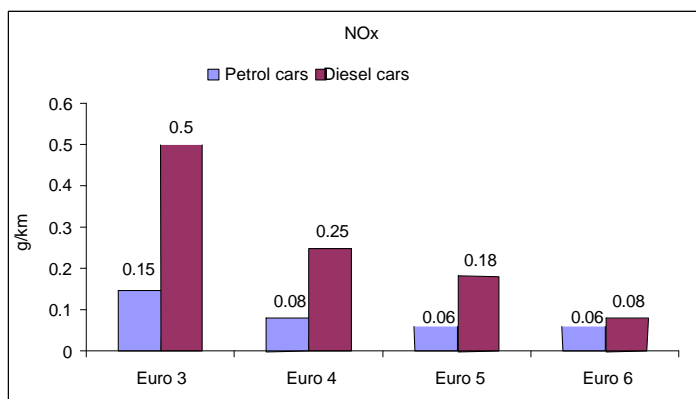


3.3. More diesel cars will add to the toxic particulates and nitrogen oxide: Both particulate matter and nitrogen oxide are high and rising in Delhi's air. Since 2000 the particulate level in Delhi's air has increased by 47 per cent and nitrogen oxides have increased by 57 per cent. The nitrogen oxide is also responsible for triggering formation of harmful ozone. The level of ozone is also increasing in Delhi.

3.4. Only at Euro VI level diesel and petrol cars become comparable: Diesel cars become comparable only at Euro VI level - to be introduced in Europe only by 2015. Even then diesel NO_x is a little higher than petrol cars. (See Graph 3: Trend in PM and NO_x emissions norms for diesel and petrol cars - Euro III to Euro VI).

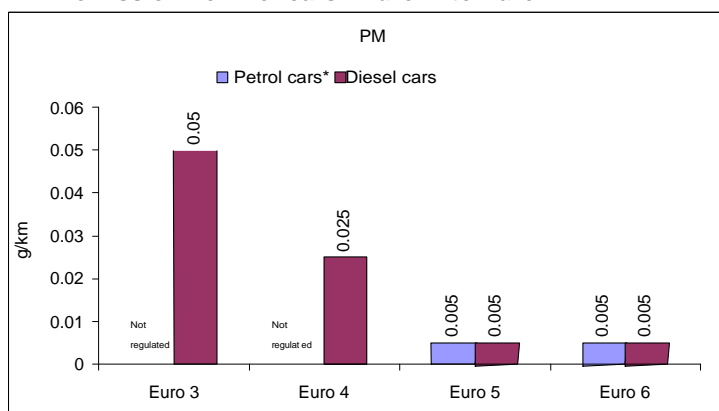
Graph 3: Trend in PM and NOx emissions norms for diesel and petrol cars - Euro III to Euro VI

i. NOx emission norm of cars



Source: Compiled from Diesel Net, European Commission's website

ii. PM emission norm of cars - Euro III to Euro VI



Note: * Petrol car PM mass standards apply only to vehicles with direct injection engines.

Source: Compiled from Diesel Net, European Commission's website

4. Public health and diesel

4.1. The WHO has reclassified diesel exhaust as class I carcinogen for its definite link with lung cancer: In June this year the International Agency on Cancer Research of the WHO has reclassified diesel exhaust as class I carcinogen with definite link to lung cancer and has brought it in the same class of deadly carcinogens as asbestos, arsenic or tobacco among others.

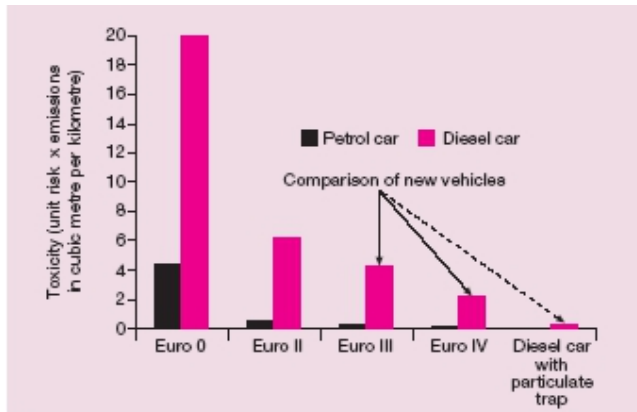
Many studies have been published that show significant increased risk of lung cancer from exposure to diesel fume. For example, a large cohort study in the US trucking industry reported a 15-40 per cent increased lung cancer risk in drivers and dockworkers with regular exposure to diesel exhaust. Indian needs to address this immediately.

Lung cancer risk in Delhi is reported to be high. The doctors of All India Institute of Medical Sciences have reported high and rising incidence of lung cancer among non-smokers.

4.2. Cancer causing potential of Bharat stage IV diesel car remains higher than petrol cars: The data available from Europe for urban traffic shows that diesel and petrol cars meeting the same level of emission norms have different toxicity levels. The toxicity is several times higher for diesel emissions even as the emission standards are progressively tightened. Bharat stage IV standards do not require use of clean diesel and advanced particulate traps to effectively reduce diesel PM (see Graph 4: Toxic profile of diesel and petrol cars meeting Euro norms).

Graph 4: Toxic profile of diesel and petrol cars meeting Euro norms

A comparison of toxicity of emissions from diesel and petrol passenger cars meeting different norms in urban traffic



Source: Michael Walsh, The global impacts of heavy-duty diesel vehicle emissions, USA, *mimeo*

4.3. There is no timeline in India for introduction of clean diesel fuel (10ppm sulphur) and clean diesel technology nation-wide: The government of India has not yet set the deadline for clean diesel fuel (10ppm sulphur) and advanced diesel vehicle standards.

Prevent trade-off between fuel efficiency and pollution: Diesel cars are 15 to 20 per cent more fuel efficient than a comparable petrol car. But they emit more harmful pollutants. Data from ARAI shows that comparable diesel cars emit seven times more particulate matter, and 7.5 times more air toxics than comparable petrol cars.

5. Government is subsidising use of diesel in cars

The price differential is leading to a boom in diesel cars. There are more than 24 diesel car models in the market. This would also make industry more resistant to emissions improvement and undermine the negotiating power of the regulator to push for tighter emissions standards. Cheap diesel for cars will add to the subsidy burden.

5.1. With each litre of petrol replaced by diesel in cars the excise revenue loss is seven times. Revenue losses will compound with increased share of diesel cars and SUVs. It is not just the excise but at every stage of price build up - pre-tax adjustments, dealer commission, state taxes etc. the gap keeps widening. This also means that the amount of excise a two-wheeler owner spends on a litre of petrol is significantly higher than what SUV owner pays on a litre of diesel fuel. How can the government justify these concessions to the car and SUV owners?

5.2. Nationally, the petrol consumption has slowed down while that of diesel has accelerated in car segment. Dieselisation is happening at a time when India has failed to adopt a clean diesel road map, prevent use of under-taxed and under-priced toxic diesel in cars, and reduce its overall consumption in all segments. The Petroleum Planning and

Analysis Cell (PPAC) of the Union Ministry of Petroleum and Natural Gas has stated that over the last 15 years petrol has nearly always recorded higher growth rate than diesel. But in 2011 the growth in petrol consumption moderated at 4.5 per cent but diesel registered 6.4 per cent growth. The excise earnings from both diesel and petrol has nearly equalled despite the fact that petrol pays seven times more excise than diesel.

5.3. It is just not the tax differences, but also the under recovery of the actual price of the fuel which adds to the burden as well as to the hidden subsidy to the car owner. Diesel is responsible for the highest share of under recovery - 58%. This also means that the oil marketing companies and government are shouldering a part of the under- recovery burden for the car owners.

6. Global measures to discourage diesel cars or to cut toxic risks

In other countries active policies are in place to disincentivise the use of diesel in cars.

- In Brazil diesel cars are actively discouraged because of the policy to keep taxes lower on diesel.
- In Denmark, diesel cars are taxed higher to offset the lower prices of diesel fuel.
- In China, taxes do not differentiate between petrol and diesel.
- Sri Lanka is a unique country in South Asia that has turned the market using taxation very effectively to discourage diesel cars. Even though Sri Lanka does not produce cars and imports most of it, differential taxes have been used very effectively to reduce diesel car sales in the country. While the total tax burden on petrol car is 244% on diesel car it is 436.90%. This has reversed the dieselisation trend and diesel fuel consumption in transport sector has dropped substantially.

7. Way forward

The galloping numbers of diesel cars must be restrained with urgent fiscal measures to reduce toxicity of the emissions in the air we breathe. In the past the Hon'ble Court has given directions to impose penalty on diesel buses in the interest of public health. The April 5, 2002 order had stated that the permits to be given to the diesel buses are to be time bound and the continued operation of the diesel buses till they are replaced would require them to pay Rs. 500/- per bus per day for 30 days of operation and thereafter Rs. 1,000/- per day and the same is to be deposited with the Director of Transport, Delhi. The revenue from this penalty is today available to the Delhi government for pollution control action. Similar strategy should be followed for the diesel cars.