DIESEL

A CASE FOR FISCAL SOLUTIONS

Centre for Science and Environment

Authors: Anumita Roychowdhury, Vivek Chattopadhyaya and Shirin Bithal
Research inputs: Shashank Gandhi
Editor: Arif Ayaz Parrey
Cover illustration: Tarique Aziz
Layout: Kirpal Singh
Production: Rakesh Shrivastava, Gundhar Das

We are grateful to the Government of Denmark for their support facilitated by the International Institute for Sustainable Development (IISD).

We are grateful to the Swedish International Development Agency (SIDA) for institutional support.

© 2015 Centre for Science and Environment

Material from this publication can be used, but with acknowledgement.

Published by
Centre for Science and Environment
41, Tughlakabad Institutional Area
New Delhi 110 062
Phones: 91-11-40616000
Fax: 91-11-29955879
E-mail: cse@cseindia.org
Website: www.cseindia.org

Printed at Multi Colour Services

DIESEL

A CASE FOR FISCAL SOLUTIONS

Centre for Science and Environment

Introduction: Penny wise, pound foolish

Why should two mainstream fuels, petrol and diesel, bear an unequal tax burden for the same usage – the personal car? Under-priced and under-taxed diesel, meant for freight and agriculture, is a lure for personal cars. Even a two-wheeler owner, who uses petrol, pays more taxes per litre of fuel than those driving SUVs. While more people are opting for diesel cars by choice, trucks and buses are captive users of diesel as it cannot be easily substituted by other fuels on a large scale. The end result is massive dieselisation of the transportation sector – guzzling 40 per cent of total petroleum products. But this dieselisation is riding high on dirty diesel fuel and outdated vehicle technology and is fouling up urban air and lungs.

There is very little public awareness of how fuel pricing has a sinister link with foul and warming emissions. Cheap diesel lowers the cost of fuel per km but creates an incentive for driving more and bigger cars. In the rebound, more driving results in more fuel use; more toxic pollution per km; more warming per litre of carbon-rich diesel burnt; and, more warming due to its heat-absorbing black carbon emissions. The World Health Organisation now brands diesel particulates as a Group I carcinogen for their strong link with lung cancer. Diesel-related pollution in the form of tiny toxic particulates and nitrogen oxides is increasing in Indian cities. The steady shift towards bigger diesel cars and SUVs has severe ramifications for the energy security as well. The price of diesel does not reflect the polluter pays principle.

Cost of diesel is not commensurate with its cost to the environment. The root of the problem is the public policy to maintain a wide differential between diesel and petrol taxes. Moreover, for a long time, the government did not pass on the entire cost of diesel to consumers, particularly rich consumers, and, along with the oil marketing companies (OMCs), absorbed a great part of the cost. This has led to enormous revenue losses.

This storyline changed somewhat when in October 2014 diesel prices were fully deregulated. The government has now allowed diesel prices to fully align with market prices. This has lowered the differential between diesel and petrol prices and there are reports of a decrease in the sale of diesel cars as well as diesel consumption. Experts are still speculating if this is a reflection of deregulation or an overall slump in the market. Only time will tell.

However, this does not diminish the attraction of low tax diesel. Fiscal experts say that people are less sensitive to absolute level of transport fuel prices in the short run. They may even buy and drive more if the income levels rise. But, experts suggest, people can be immensely sensitive to price differences between fuels.

Share of transportation sector in total petroleum consumption

40%

The only reason why the price of diesel and its taxation have become part of the environmental conversation in India is the greater negative impact of poor quality diesel on public health and climate. But the country does not have an effective roadmap on emissions standards to obtain clean diesel technology and fuel to minimise these risks.

There is only a proposal from the Auto Fuel Policy Committee set up by the Union Ministry of Petroleum and Natural Gas. This proposes to introduce Euro V emissions standards in 2020 and Euro VI as late as 2024. This is a serious slowdown that aims to maintain a time lag of 10 years with Europe. But even this action-plan has come with a rider. It says that to produce the requisite fuel quality, with sulphur content only upto 10 ppm, needed to introduce Euro V standards of emissions control technologies by 2020, the refineries will require an astounding amount of Rs 80,000 crore to upgrade. This is possible only if the government agrees to create a clean fuel fund from the additional revenue expected from the proposed cess on fuels and also from the price equalisation of the current Bharat Stage III and Bharat Stage IV fuels. This fund will be used to extend fiscal support to the refineries.

While the actual higher-bound cost of refinery upgrades estimated by the oil companies needs re-evaluation, the government would still need to take a quick decision on a fiscal strategy to remove any cost hurdles to introducing clean fuels. In the ongoing PIL on air pollution in Delhi the Union Government in its affidavit to the Supreme Court has indicated the possibility of introducing Euro VI by 2020. This should be immediately mandated.

Without a fiscal strategy, the refineries may still want to delay their investment decision much beyond this decade making this into a no-action roadmap. This will not only hurt public health but also affect the competitiveness of the automobile business in the long run as all vehicle producing regions of the world will have made a paradigm shift in their technology genre.

The Government of India will have to take onboard the proposal for a clean fuel fund and immediately detail out the tax and pricing measures to get it rolling. This is needed not only to enable a quick transition to clean diesel but also to control dieselisation. Solutions lie in equalising the prices of all fuels to remove distortions in the market, impose clean fuel cess to generate revenue for clean fuel fund, and slap additional taxes on the end use of fuel – the car. At a time when crude oil prices are low, instead of passing on the entire reduction to the consumers and inciting fuel guzzling, the government can rationalise and fix a cess on fuels to generate additional revenue to meet the cost of refinery upgrades and other priority measures for sustainable mobility. In fact, the government has recently increased excise on both the fuels to use the revenue to build roads. But this should also be leveraged to protect public health.

With the help of fiscal measures it is possible to leapfrog vehicle technology and fuel quality to a much cleaner benchmark of Euro VI emissions standards by 2020. To ensure that this process is not delayed and investments are made on time, the government must implement fiscal measures to tax the bad to fund the good.

Fuel pricing and tax reforms cannot happen in isolation, cut off from the concerns over public health, energy security and climate impacts. ■

Auto Fuel Policy Committee proposal

Euro V 2020
Euro VI 2024

This is too little too late. Leapfrog to Euro VI by 2020. Design fiscal measures to fast track change

1. Diesel: Less fire, more smoke

Share of diesel cars in new car sales increased to more than

50%

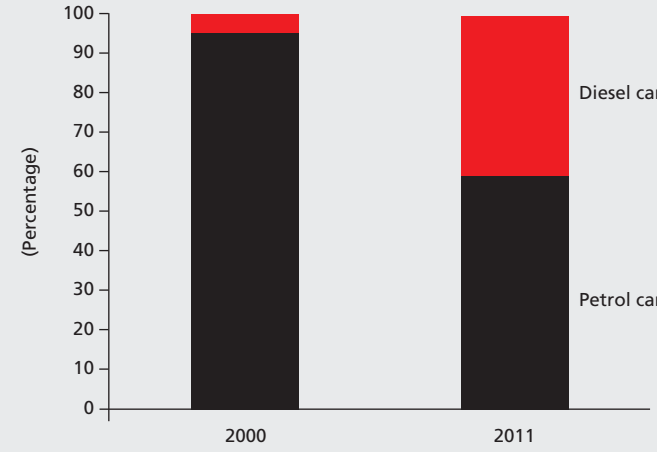
Threat of dieselisation: The unique challenge for India is massive dieselisation of the transportation sector, propelled by diesel cars. India is experiencing a very rapid dieselisation of the car segment. Diesel cars were 4 per cent of the new car sales in 2000; that increased to more than 50 per cent by 2012 (see Graph 1: *New car sales*). This encouraged the automobile industry to roll out more diesel car models. In popular car models the share of diesel car variants are as high as 70-75 per cent. In the recent past, especially during 2009-13 when international oil prices had skyrocketed, sending petrol prices into a tizzy, rate of dieselisation skewed significantly. In 2010-11, the rate of increase in diesel car sales was 34 per cent over the previous year. It is now predicted that even at a moderate and flat growth rate of 20 per cent a year, the total diesel cars in 2020 will be double the size of the total car sales today.

Even during the recession, when there was an overall slump in the market and car sales had taken a hit, the bigger SUV segment showed high growth rate. This was largely a result of a combination of the lure of cheap diesel prices and consumer preference for bigger vehicles. Between 2009-10 and 2010-11 cars with engines around 1400 cc grew by 45 per cent and 2000 cc by 41 per cent. (See Graph 2: *Diesel cars sales by engine size*).

Cheap diesel also turned the fuel market around significantly. According to the official reports of the Petroleum Planning and Analysis Cell (PPAC) under the Union Ministry of Petroleum and Natural Gas, in 2012 diesel cars at 15 per cent of diesel use were already the second largest user of diesel in the country, even though diesel is subsidised for agriculture and freight (see Graph 3: *Diesel consumption*). Cars were using more

Graph 1: New car sales

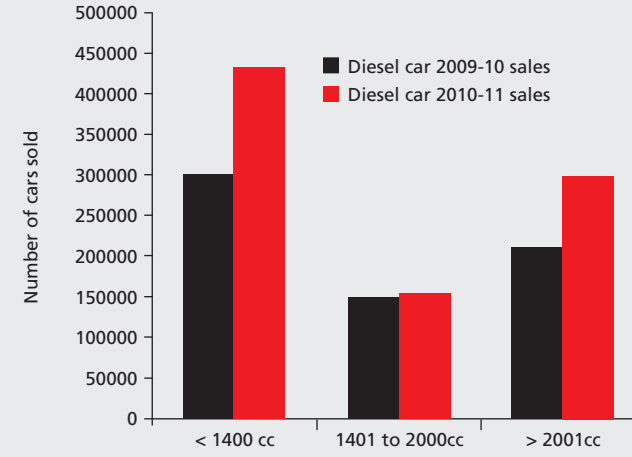
Share of diesel cars has increased



Source: Compiled by Centre for Science and Environment

Graph 2: Diesel car sales by engine size

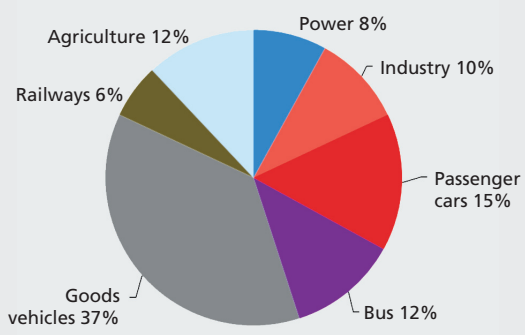
Cars with bigger engines have witnessed a higher growth rate



Source: Compiled by Centre for Science and Environment

Graph 3: Diesel consumption

Passenger cars are the third largest users of diesel



Source: PPAC

diesel than agriculture and buses. Thus, rich car owners are the beneficiary of the fuel pricing policy.

Heavy duty dieselisation: Heavy duty vehicles – trucks and buses – are the prime driver of diesel use in the transportation sector. Indian cities are expected to see – and legitimately so – massive expansion of bus transport, and also a very rapid shift towards road-based freight transport. The share of railways – the cleaner freight, has already dropped to 26 per cent. Trucks and buses are high emitters of particulate matter and black carbon. As highways cut across cities, the negative impact of freight transport on public health in urban India is aggravated. Several studies show very high night time pollution from trucks in cities like Delhi. Unless the engine technology of buses and trucks and the quality of fuels are improved, there will be severe impacts on environment and public health.

Cars consume

15%

of total diesel

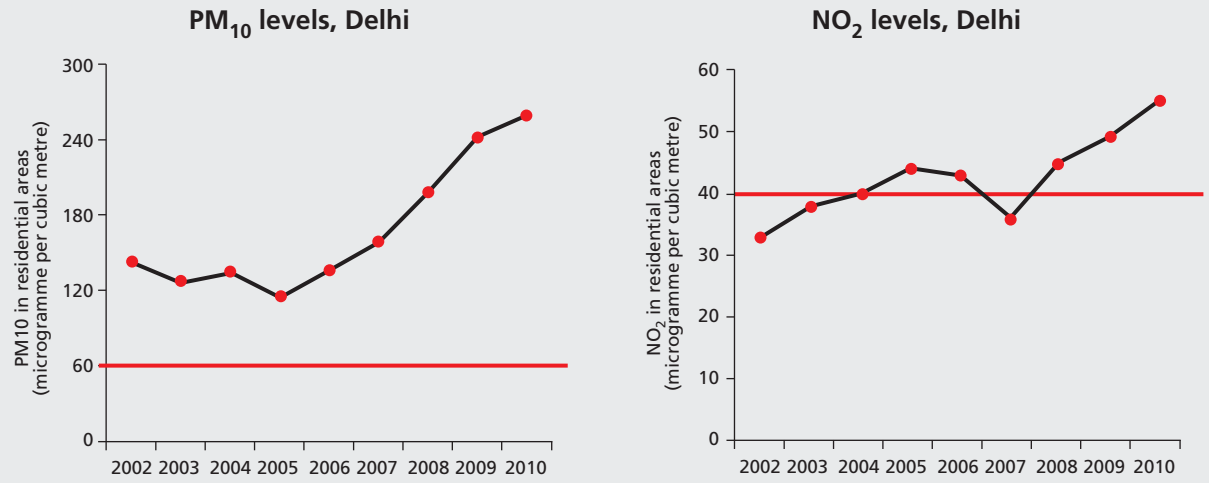
They are the second largest user of diesel

They guzzle more diesel than agriculture and buses

Dieselisation fouls up urban air: The concentration of diesel-related air pollutants, already high, is rising at an alarming rate in Indian cities. Particulate matter and nitrogen oxides that are predominantly emitted from diesel vehicles are a matter of serious concern in Delhi and other Indian cities (see Graph 4: *Delhi in pincer grip of multiple pollutants*). According to the Central Pollution Control Board's latest National Air Quality Status report for 2012, particulate matter of less than 10 micron size (PM10) has exceeded the standard in 125 cities, of which 40 cities are in the high pollution bracket and 85 cities in the critical category. Out of total cities monitored 53 per cent cities have critical levels.The levels of nitrogen dioxides are exceeding the safe levels in 13 cities. Health studies have shown that an increase of only 10

Graph 4: Delhi in pincer grip of multiple pollutants

Levels of particulate matter and nitrogen oxides increasing alarmingly



Source: CSE compilation based on DPCC/CPCB air quality data

microgramme/cum of PM2.5 leads to significant increases in health risks. High exposure increases hospitalisation for asthma, lung diseases, chronic bronchitis, heart damage and lung cancer.

A 2004 World Bank study has found that the contribution of diesel combustion to the PM2.5 load in cities like Delhi and Kolkata is as high as 23 per cent to nearly 61 per cent depending on the seasons, respectively. The overwhelming growth in the number of diesel cars can be devastating in cities desperately seeking answers to rising levels of smoke, particulates and NOx. NOx further aggravate the problem of ozone which is not directly emitted by any source. It is usually NOx that catalyse reaction between volatile organic compounds in the air under the influence of intense sunlight and high temperature and creates ozone, a very harmful gas when present in the troposphere.

High share of urban population is exposed to high level of particulate pollution

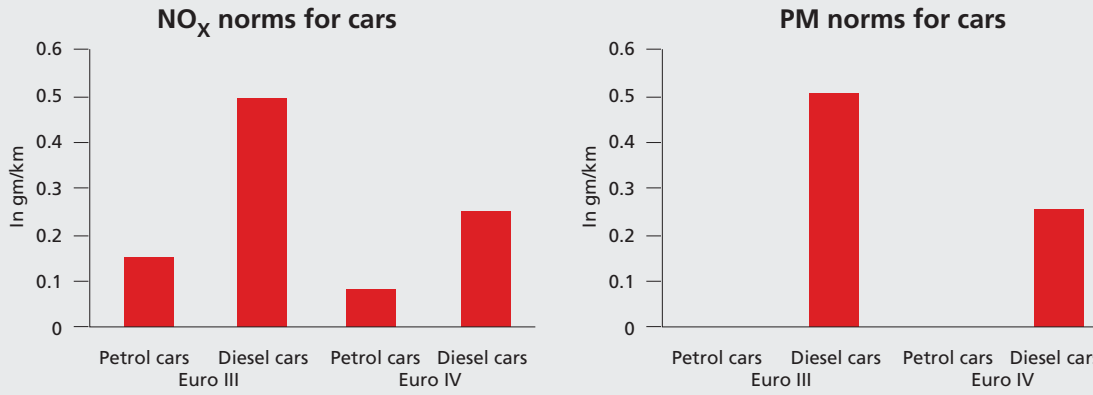
Licence to pollute: It may be noted that the current European emissions standards for cars gives legal sanction to diesel cars to emit more particulate matter and nitrogen oxides compared to petrol cars (see Graph 5: *Legal licence to emit more particulate and nitrogen oxides*). While particulate levels in petrol cars are not regulated for their negligible emissions, diesel cars are allowed to emit three times more nitrogen oxides than a petrol car. The actual emissions factors developed by the Automotive Research Association of India shows that the particulate emissions from diesel cars are seven times higher than from petrol cars.

Share of cities with critical level of PM10 is as high as
68%

Toxic risk from diesel fumes: In June 2013, the International Agency for Research on Cancer of the World Health Organisation (WHO) reclassified diesel exhaust as a Group 1 carcinogen for its strong link with lung cancer.

Graph 5: Legal licence to emit more particulates and nitrogen oxides

The emissions standards for diesel cars are much more lenient than those for petrol cars



Note: * Mass PM emissions from petrol cars is considered negligible hence it is not regulated.
Bharat Stage III emission norm are equivalent to Euro III emissions norms

Sources: Bharat Stage III emission norm: Anon 2004, Notification No G.S.R. 686 (E), dated 20th October 2004 – Bharat Stage III emission norms, Ministry of Shipping, Road Transport and Highways, Government of India; Euro IV equivalent emission norm: Anon 2002, Report of the expert committee on Auto Fuel Policy, Government of India, New Delhi, August

Table 1: Unit risk factor of different toxins

Higher unit risk factors signifies greater chance of occurance of cancer, diesel tops the list of the unit risk factor among air pollutants

Toxic air contaminant	Unit risk/ million people	Detection limit (ppb)
Acetaldehyde	2.7	0.10
Benzene	29	0.05
1,3-Butadiene	170	0.04
Carbon Tetrachloride	42	0.02
Chromium, Hexavalent	150,000	0.06 (in nanogram)
Para-Dichlorobenzene	11	0.30
Formaldehyde	6	0.10
Methylene Chloride	1	0.10
Perchloroethylene	5.9	0.01
Diesel particulate matter	**300**	**N/A**

Note: Unit risk represents the number of excess cancer cases per million people per microgramme per cubic meter TAC concentration over a 70 year lifetime exposure. A diesel particulate matter unit risk value of 300 is used as a reasonable estimate in the risk reduction plan to reduce particulate matter emissions from diesel fuelled engines and vehicles (ARB, October 2000)

Source: California Air Resources Board

Diesel exhaust is now in the same class of deadly carcinogens as asbestos, arsenic and tobacco, among others. The IARC-WHO has urged worldwide efforts to reduce exposure to diesel fumes.

Other governments consider toxic air contaminant (TAC) unit risk factors to prioritise action. Unit risk represents the number of excess cancer cases per million people per microgramme per cubic metre TAC concentration over a 70-year lifetime exposure. A diesel particulate matter unit risk value is used as a reasonable estimate by the California Air Resources Board (see Table 1: *Unit risk factor of different toxins*). This signifies that the number of excess cancer cases per million people due to lifetime exposure to diesel fumes is 300 as opposed to 29 for benzene, another deadly toxin from petrol.

This calls for immediate action. In India, the National Cancer Control Programme (NCCP) estimates that over 700,000 new cases and 300,000 people are set to die every year from cancer. The NCCP forecasts that by 2026, more than 1.4 million people will be caught in the grip of the disease. It has listed greater exposure to environmental carcinogens as one of the most important reasons.

Another study carried out by the Chittaranjan National Cancer Research Institute in 2004-05 has found that about 26 per cent of Delhi residents have undergone chromosomal damage that can be a precursor to cancer due to air pollution. This demands rapid reduction in environmental risk factors.

Cancer risk of diesel particulate matter is much higher than other known air toxins. Unit risk factor of diesel particulates

300

Diesel aggravates energy and climate insecurity: The automobile industry hard sells diesel cars on the ground that they are more fuel efficient than petrol cars and therefore good for saving energy and inflicting minimum damage to the climate. In reality it is just the opposite.

In the unique small-car market of India, dieselisation of cars is pushing the market more rapidly towards bigger cars and increasing the overall mass of the car fleet, leading to more consumption of fuel. Most diesel models are in the heavier weight classes. Cheaper diesel will aid in the shift towards heavier models. The International Council on Clean Transportation has estimated that if the sales of large vehicles and SUVs were to grow from around 30 per cent of new vehicle sales in 2012 to 40 per cent in 2022, the resulting additional fuel use in 2022 will be 8 million tonnes of oil equivalent. This is equivalent to the fuel use of all four-wheel passenger vehicles in 2007. By 2030, the cumulative additional oil use would grow to 42 million tonnes of oil equivalent, which is equal to the fuel use of all passenger vehicles in India in that year.

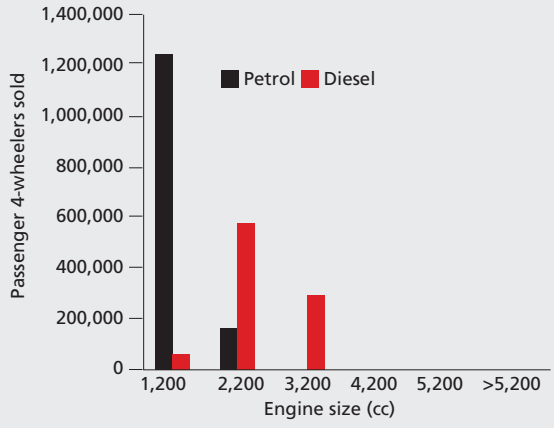
When the price differential between petrol and diesel fuels skewed around 2011-12, petrol car sales were higher in small car segment – 87 per cent of petrol cars have an engine size below 1.2 litres, and the engine size of 40 per cent of diesel cars is 1.5 litre, with the rest having even bigger engines. (See Graph 6: *Average engine sizes of petrol and diesel cars sold in Indian market*).

India continues to be energy insecure owing to the huge impediments it faces in meeting its energy demands every year. India, at present, depends on

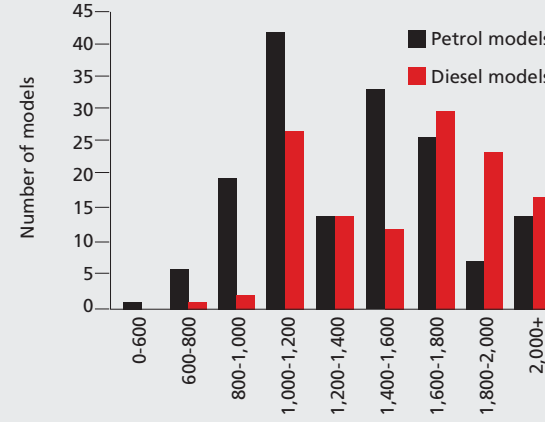
Graph 6: Average engine sizes of petrol and diesel cars sold in the Indian market

Both the absolute number and the number of models of diesel cars sold have much bigger engines, on an average, than petrol cars

Distribution of petrol and diesel car sales according to engine size



Distribution of petrol and diesel car models according to engine size

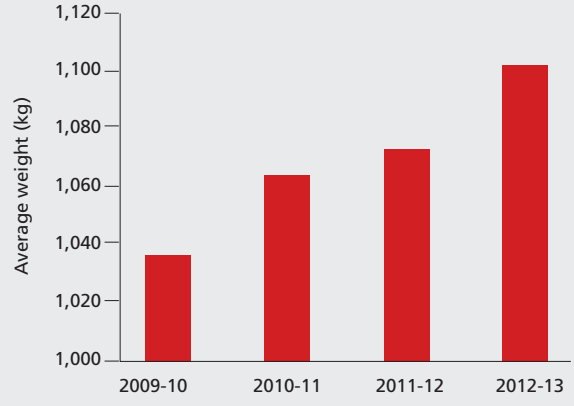


Source: Compiled by Centre for Science and Environment

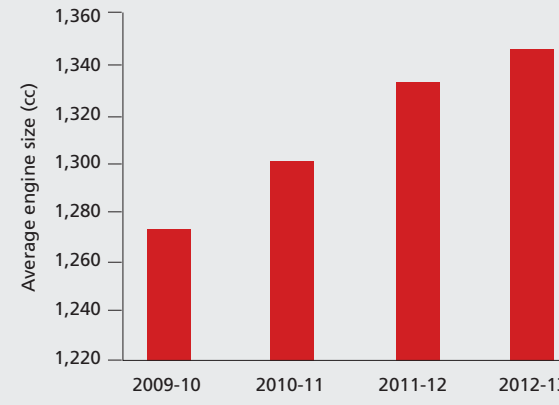
Graph 7: Trends in average mass and engine sizes of cars in India

The average weight as well as the average engine size has been growing rapidly for all cars sold in India

Trend in average weight of cars



Trend in average engine size of cars



Source: Compiled by Centre for Science and Environment

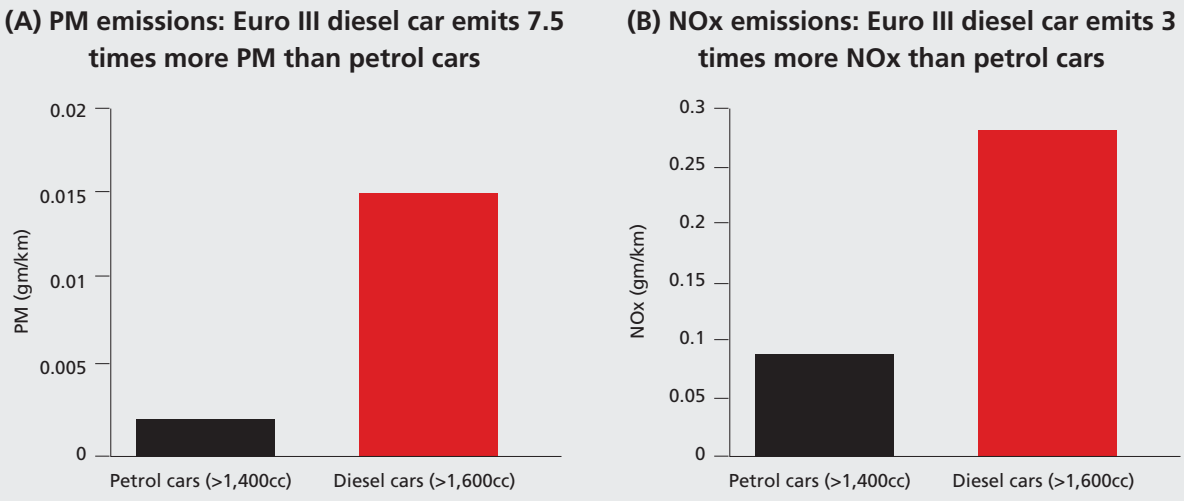
imports for more than 80 per cent of its crude oil requirement. Given this huge dependence on imports, the prices of petroleum products are greatly influenced by fluctuations in international market prices.

If the car sales double by 2020, it will have significant impact on the already increasing average mass of the car fleet (see Graph 7: *Trend in average mass and engines sizes of cars in India*). The average weight and engine size during 2009-10 and 2012-13 has increased by six per cent. On an average, the weight and size of new vehicles is increasing at the rate of two per cent.

India imports
80%
of its crude oil requirements

Graph 8: Difference in actual emissions between Euro III petrol and diesel cars

Euro III is much more lenient with diesel cars than petrol cars



Note: * Mass PM emissions from petrol cars is considered negligible hence it is not regulated.
Bharat Stage III emission norm are equivalent to Euro III emissions norms

Source: Automotive Research Association of India

It is also worrying that this trend in the market is getting more entrenched without any fuel economy regulations. The final fuel economy regulations will come into force only in 2022.

Analysis carried out by the Centre for Science and Environment, based on actual emissions data available from the Pune-based Automotive Research Association of India, show enormous differences in the actual emission levels of Euro III (Bharat Stage III) diesel and petrol cars that are currently sold in Delhi and other major Indian cities. Euro III diesel cars emit 7.5 times more toxic particulate matter (PM) than comparable petrol cars (see Graph 8: *Difference in actual emissions between Euro III petrol and diesel cars*). This means that one diesel car is equal to adding 7.5 petrol cars to the car fleet in terms of PM emissions and three petrol cars in terms of NOx emissions. This clearly reflects the flawed and lax emissions standards that allow diesel cars to emit more NOx and PM compared to petrol cars. Total air toxics from a diesel car that are very harmful and carcinogenic are seven times higher than petrol cars.

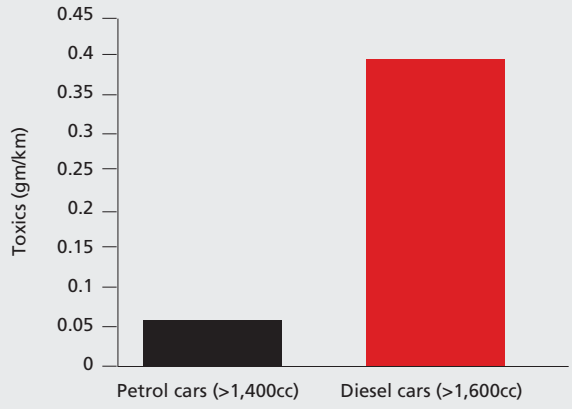
Diesel cars emit 3 times more NOx 7.5 times more PM compared to petrol cars

Rebound effect: Diesel cars are 15 to 20 per cent more fuel efficient than comparable petrol cars and therefore emit less greenhouse gases. ARAI data shows Euro III Indian diesel cars emit 1.2 times less carbon dioxide compared to their petrol counterparts (see Graph 9: *Euro III diesel and petrol cars emissions comparison*). However, diesel has higher carbon content than petrol. If more diesel is burnt because of more driving, especially encouraged by cheaper prices, more heat-trapping CO_2 will escape. This is the rebound effect of subsidised and low tax diesel. It has been noticed and experienced in several European countries.

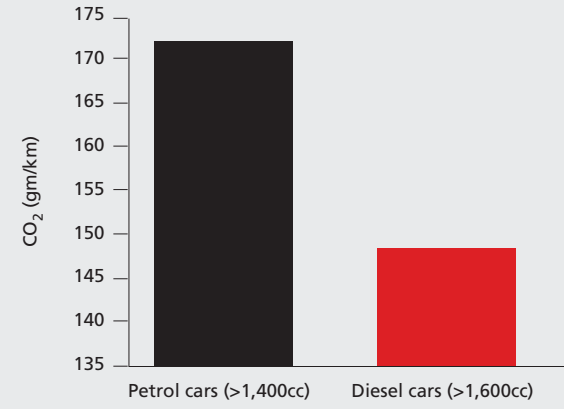
Graph 9: Euro III diesel and petrol cars emissions comparison

Diesel cars emit less CO_2 than petrol cars but much more air toxics

Euro III diesel car emits nearly 7 times more air toxic emissions



Euro III diesel car emits nearly 1.2 times less carbon dioxides



Note: * Mass PM emissions from petrol cars is considered negligible hence it is not regulated.
Bharat Stage III emission norm are equivalent to Euro III emissions norms

Source: Automotive Research Association of India

Black carbon emissions: In conventional strategies for climate mitigation the warming effect of black carbon emissions from diesel vehicles is not accounted for. New scientific research has already implicated black carbon for being several times more heat trapping than CO_2. The most recent comprehensive global scientific study on short lived climate forcers, 'Bounding the role of black carbon' report 2013, states that globally diesel black carbon emission is expected to be 20 per cent of the total black carbon emissions. But total emissions from petrol vehicles are less than 10 per cent of diesel black carbon emissions, although petrol vehicles are more numerous (see Graph 10: *Share of black carbon in petrol and diesel emissions*).

Black carbon absorbs radiative heat from the sun and warms everything around it. In fact, the recent IPCC report has (AR5 WGI) for the first time included estimates of global warming potential (GWP) for black carbon. These are significantly higher values than earlier estimates. These are 800 times the GWP values of CO_2 over a time horizon of 100 years. The UNEP 2011 states that reducing short-term forcers is likely to slow down the rate of global warming over the next two to four decades. Long-lived CO_2 is steadily pushing up global temperature but short-lived climate forcers accelerate short spikes.

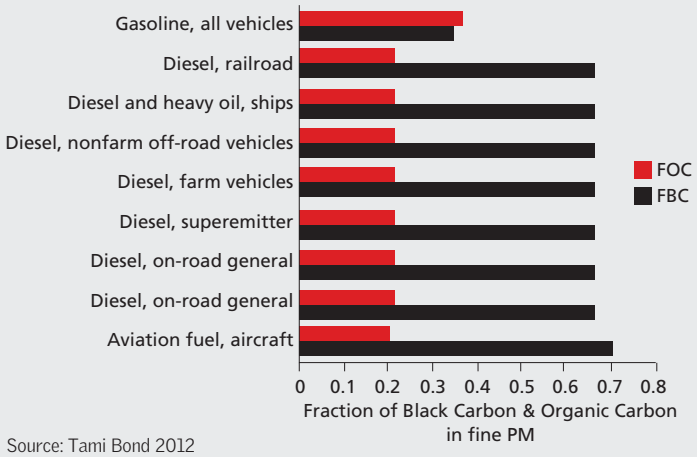
Black carbon falls onto snow and ice and changes the overall reflectivity of those surfaces, accelerates melting, exposes the darker ground or water, causing even faster warming. It also affects rainfall as black carbon interacts with clouds and affects rainfall patterns. Black carbon is the core of diesel particulate matter.

If the warming impact of diesel black carbon is included in the climate impact assessment of dieselisation it will completely negate the miniscule CO_2

Black carbon has
800 times
more global warming potential than CO_2

Graph 10: Share of black carbon in petrol and diesel emissions

Diesel cars emit much more black carbon than petrol cars



Source: Tami Bond 2012
FOC: Fraction of fine particulate matter that is organic carbon.
FBC: Fraction of fine particulate matter that is black carbon.

advantage that diesel cars have over petrol cars on a per kilometer basis.

CO_2 emissions from the upstream diesel refining process to increase: Studies are also pointing towards the fact that life cycle CO_2 emissions of diesel refining can also be high as upstream refining is energy intensive. In fact, the European Commission has found lifetime pollution costs of Euro IV compliant diesel car to be much higher than petrol cars. Thus, the available evidence nullifies the marginal greenhouse gas reduction benefit of diesel car, and costs higher to the society.

Moreover, cheap fuels incite fuel guzzling. A World Bank study (2010) has found six countries (the US, Russia, China, Brazil, Mexico and Canada), that undertax fuels that are also cheaper, are responsible for more than 40 per cent of transport oil GHG emissions. But a much larger number of countries that overtax transport fuels together account for 28 per cent of transport fuel GHG world emissions (see Graph 11: *Fuel taxation and consumption*).

Lifecycle CO_2 emissions from diesel refining

much higher

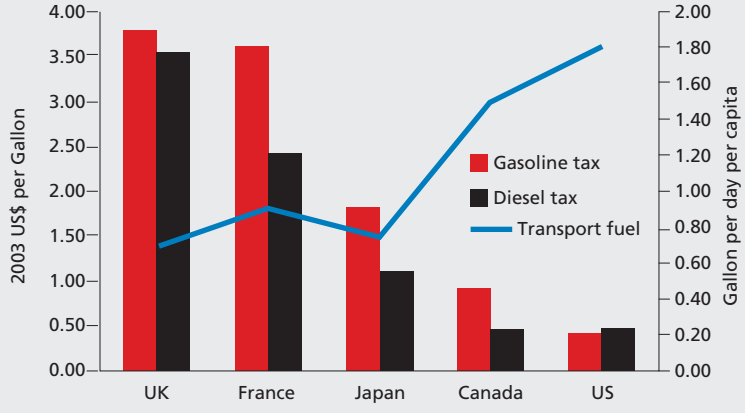
than from petrol refining

Learn from Europe's experience: It is evident from the European experience that dieselisation cannot be the plank for meeting climate goals. As much as 50-70 per cent dieselisation of car segment has been reported in different countries of Europe. This is largely because of the price difference between petrol and diesel fuels, premium on fuel economy and the CO_2 mitigation efforts to encourage fuel-efficient cars. Following such massive dieselisation, diesel black carbon accounted for as much as 43 per cent of black carbon emissions in Europe in 2010 as opposed to global average of 20 percent.

The European industry had relied heavily on expanding the diesel car fleet to reduce CO_2 emissions and meet the CO_2 target of 140g/km in 2008 and 120g/km in 2012. But Europe could neither come close to meeting their targets for reduction of CO_2 emissions, nor their local air quality targets within this timeline. With dieselisation, the average power of the car fleet in Europe had also increased by 30 per cent since 1990.

Graph 11: Fuel taxation and consumption

Countries which tax less encourage more consumption



Source: Petroleum Planning & Analysis Cell

European cities have found it difficult to meet their air quality guidelines. The stark evidence of this is the landmark judgment of the Court of Justice of European Union that has reinforced the obligations of all member states to have a clear action plan to meet the air quality standards for the period specified. In this case United Kingdom was dragged to the court by civil society groups for breaching the Air Quality Directives. Since 2010, about 40 of its zones have recorded nitrogen oxide levels higher than the standards. The bigger story is that diesel vehicles have now become the eye of the storm.

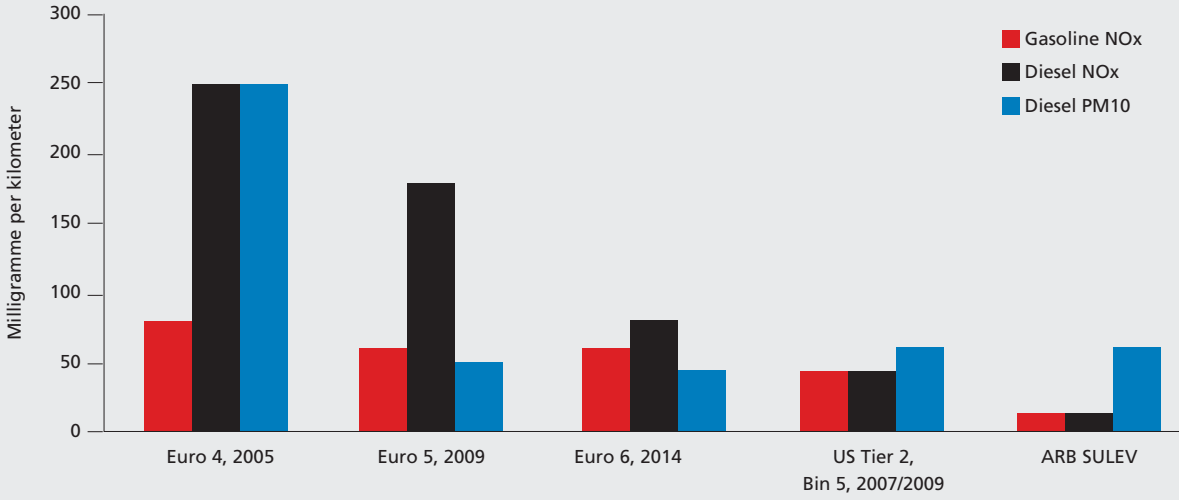
Leapfrog to clean diesel fuel and technology for climate and health co-benefits: The only solution to toxic diesel emissions is to make diesel and vehicle technology meet the cleanest benchmark. Globally, efforts are being made to make emission standards more stringent to enable quicker uptake of advanced emission-control systems and clean diesel fuel to reduce emissions and cut the toxic risk. India follows European emissions standards but with a considerable time lag. Currently, Euro IV in a few cities and Euro III in the rest of the country are in place. But Euro IV technology being implemented in India is nine years behind Europe and the implementation of Euro III is 14 years behind Europe.

Euro IV is also not stringent enough to force adoption of effective particulates and nitrogen oxide emission control systems. India will have to quickly move to Euro V and Euro VI emissions standards. Particulate norms are lowered in cars and light-duty commercial vehicles from Euro IV to Euro V but not for buses or heavy-duty commercial trucks. For that we need to adopt the more stringent Euro VI for these vehicles (see Graph 12: *European emission standards that are followed by India*). Only from Euro V onwards standards are also set not only for mass of particles but also for particle numbers that can be met only with advanced emission-control systems. Euro VI is the ultimate target in the immediate timeline to begin to close gap between petrol and diesel.

Dieselisation strategy has not helped Europe meet their CO_2 emission targets

Graph 12: European emission standards that are followed by India

The NOx and PM10 emission levels of Euro III and IV are dangerously high when compared to US Tier 2 and California norms. This is particularly true of diesel emissions



Source: International Council on Clean Transportation

Petrol and diesel emissions norms for NOx begin to close the gap only at the level of

Euro VI

Even with successive improvement in emissions standards (Euro I, II, III, IV, V, VI), very high ratio of black carbon to organic carbon persists in the emissions. According to the 2014 World Bank study fleet-wide averages taken in a global emissions inventory model shows that while the share of black carbon in the particulate emissions from Euro II model was 80 per cent it has reduced to 25 per cent in the Euro V fleet – but is still a problem. Black carbon reduction technologies become effective for cars at Euro V level and for heavy duty vehicles only at Euro VI level.

No action roadmap: In the meantime, the Auto Fuel Policy Committee set up by the Union Ministry of Petroleum and Natural Gas has proposed a roadmap for emission standards until the year 2025. It has proposed Euro IV nation-wide by 2017-18; Euro V by 2020-21 and Euro VI by 2024-25. This is too little too late. It is also conditional. The requisite fuel quality needed for the introduction of Euro V and Euro VI will cost a whopping Rs 80,000 crore. Therefore, fiscal support may be extended to the refineries to enable introduction of cleaner fuels. The Committee has suggested a fiscal strategy to create a clean fuel fund by tapping into additional revenue from a proposed cess on fuels and from a proposed price equalisation of the current Bharat Stage III and Stage IV fuels. This also means that if the government does not frame a fiscal strategy quickly enough even this slow roadmap will remain unimplemented.

Already, serious delays have resulted from the government not announcing the post-2010 emission standards roadmap well in advance to allow improvement in emission standards every five years after 2010. Under the first phase of emissions standards regulations, Euro III nation-wide and Euro IV emissions standards were implemented in only 13 cities in 2010. Euro IV was subsequently expanded to 30 more towns and cities. But as of today, there is no offical roadmap to suggest how soon the automobile industry as well as refineries will move to the next stage of emission standards.

It is therefore clear that India needs regulatory action to set clean-emissions benchmarks for fuels and vehicle technology and also fiscal measures to discourage dieselisation based on poor quality fuels and technology. In addition, India needs to have a comprehensive fiscal strategy to meet the cost of investments to accelerate the emission standards roadmap. ■

2. CNG, petrol and diesel: Linked at birth

With the economic downturn, fuel subsidy began to weigh down the economy even more. Signs on the wall were clear. Without a decision on the fate of fuel subsidies economic stress would worsen.

Subsidy on petroleum and natural gas in 2012-13
Rs 96,880 crore

Fuel subsidy and growing fiscal burden: In 2010-11, total expenditure on subsidies was estimated to have grown by as much as 26.7 per cent compared to the previous year. Bulk of the subsidy remained tied with under-recoveries of the public-sector oil companies. During the financial year 2012-13, the subsidy burden of petroleum and natural gas sector stood at Rs 96,880 crore accounting for a massive 38 per cent of the aggregate government subsidies of Rs 257,654 crore. This excluded Rs 60,000 contribution by the upstream oil companies to the OMCs in that year. On the whole, the energy subsidy was therefore even larger. In the Union Budget 2012-13, government targeted to maintain the level of gross subsidy to under two per cent of GDP and reducing to 1.75 per cent within three years. But in 2013-14 the subsidy burden rose enormously. This compelled decision on deregulation of diesel prices.

The biggest loss is in the car sector where 40 per cent of the fuel used in cars has been the subsidised meagrely taxed diesel. Subsidised diesel was cheaper than industrial fuels like furnace oil and that led to huge diversion of diesel for industrial use as well. This is gross misuse of government subsidy. This massive increase in diesel use thanks to state subsidies and tax policies has put Indian economy at a serious risk.

Per cent of total subsidies
38%

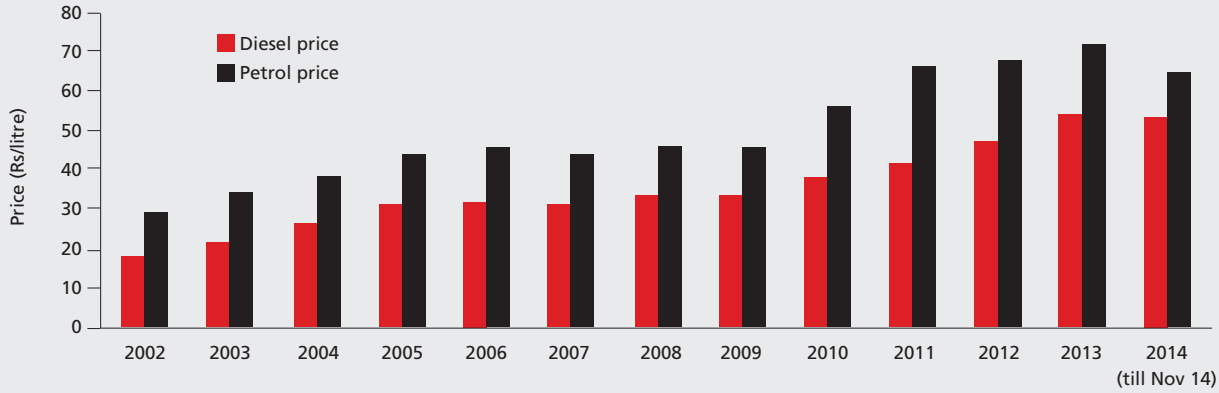
The process of fuel price deregulation had started a long time ago, but took ages to complete. Way back in 1998, the government had announced the dismantling of the Administered Pricing Mechanism (APM) which came into effect from April 1 of that year (except for fuels like domestic LPG and PDS kerosene). However, the process could not be continued beyond April 2002 and the government restarted controlling the prices of major petroleum products.

In the case of automobile fuels, both diesel and petrol pricing remained under control until June 26, 2010 when petrol pricing was 100 per cent deregulated and was aligned with international market prices. This further skewed the price difference between petrol and diesel, fanning the massive dieselisation of the recent years.

How fuel subsidy distorted automotive fuel market: The policy of levying minimum taxes and heavily subsidising diesel has completely distorted the automotive fuel market of diesel, petrol and CNG. This is largely a reflection of the wide price differences (see Graph 13: *Prices of Petrol and Diesel, 2002-14*). The gap between the retail prices of these fuels has been the widest around 2009-13 when the international crude prices had increased significantly

Graph 13: Prices of petrol and diesel, 2002-14

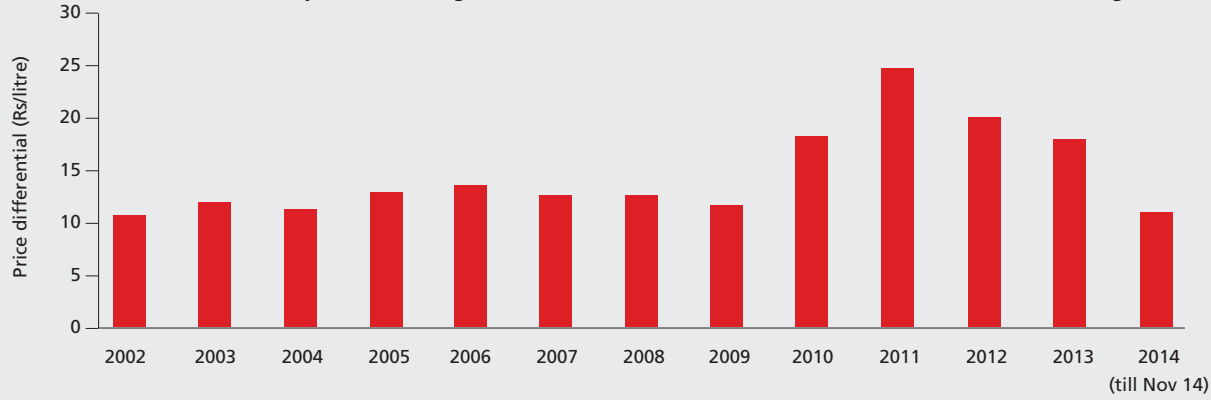
While the prices of petrol and diesel have been rising with inflation in the last decade, the difference in the prices of petrol and diesel grew undesirably due to faulty fiscal policy, encouraging dieselisation



Source: Compiled by Centre for Science and Environment from information available from IOC product prices

Graph 14: Price differential between petrol and diesel in Delhi (2002-14)

The differential increased when petrol was deregularised and diesel was not, and decreased when diesel too was deregulated



Source: Compiled by Centre for Science and Environment from information available from IOC product prices

Difference in diesel and petrol prices in Delhi

2010-11 Rs 18 – Rs 24

2013 Rs 19.91

2014 Rs 7.68

Despite deregulation, the price of diesel is less than that of petrol

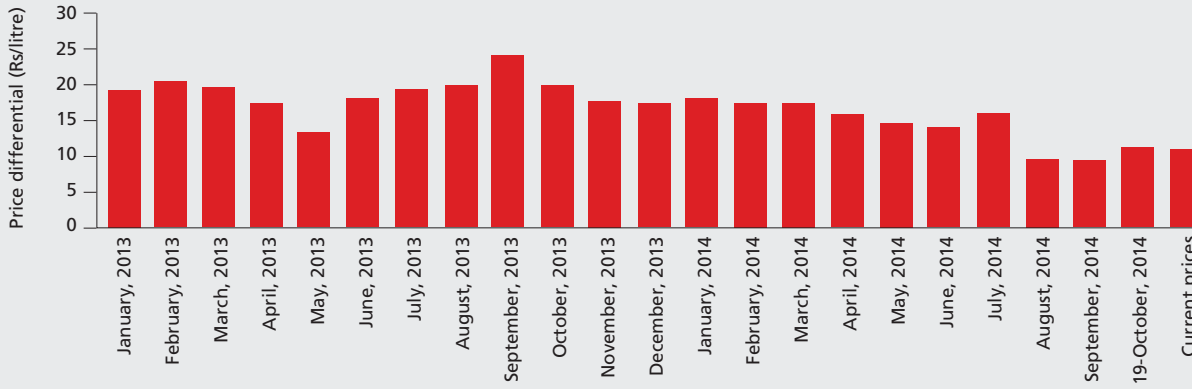
leading to pressures on the price of petrol. Diesel prices continued to remain regulated during this period.

During 2010-11 the price difference between diesel and petrol in the Delhi market was as high as Rs 18 – Rs 24 (see Graph 14: *Price differential between Petrol and Diesel, 2002-14*). The price differential between petrol and diesel was highest in 2011 (Rs 24.73/ litre, 60.45 per cent respectively – taking year end prices). A policy of gradual deregulation was started by the India government with effect from January 18, 2013. Before that, the price differential between diesel and petrol was Rs 19.91or 41.78 per cent (Petrol was priced at Rs 67.56 on January 16, 2013 and diesel was priced at Rs 47.65 on 17th January, 2013). Diesel was completely deregulated on 18th October, 2014. Just before that, the price differential was Rs 7.68 or 13.02 per cent (diesel price Rs 58.97 in Delhi, petrol price Rs 66.65).

Immediately after the deregulation, diesel prices fell to Rs 55.6 on October 19, 2014 and further dipped to Rs 53.35. The current price differential between petrol

Graph 15: Monthly price differential between petrol and diesel

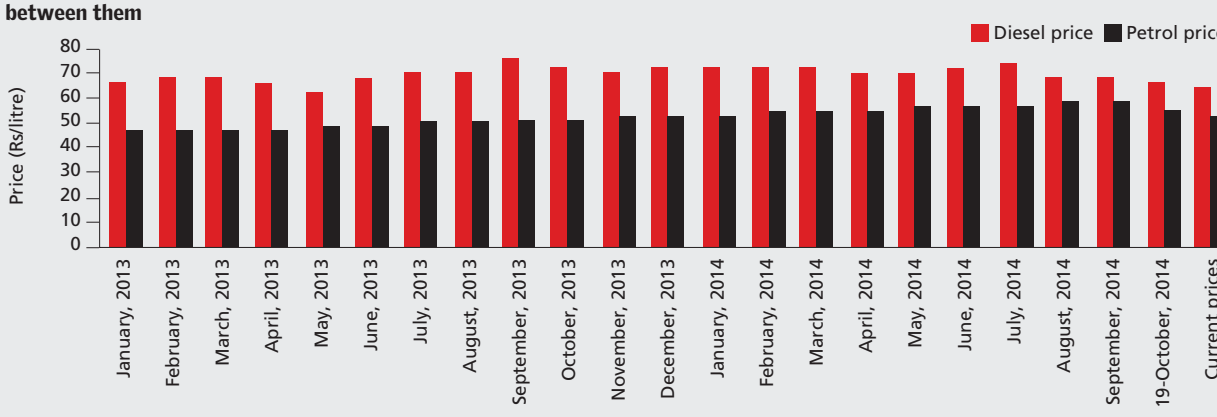
A marked decrease can be observed after diesel prices were deregulated too



Sources: Complied from market sources

Graph 16: Price build-up of diesel and petrol (2013-2014)

Prices of both petrol and diesel have responded to international rates post deregularisation, decreasing the differential between them



Source: Complied from market sources

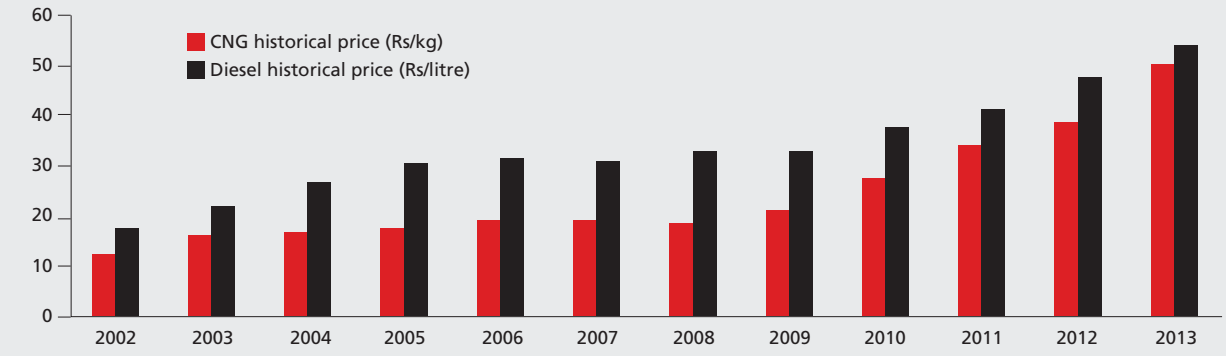
and diesel in Delhi – in November – is Rs 10.93, or 19.65 per cent. It has been reported that since the formation of the new government in May 26, 2014, petrol prices in Delhi have come down by around Rs 8 per litre, or 11.3 per cent, and Rs 4.2 per litre for diesel or 7.4 per cent.

As soon as the process of price deregulation started the price gap began to decline and drop. (Graph 15: *Monthly price differential between petrol and diesel*) and (Graph 16: *Price build-up of diesel and petrol 2013-2014)* between petrol and diesel show that it has never gone below Rs 10 per litre. The only exception was in August and September 2014 when government was gradually increasing the diesel prices by 50 paise per litre. However, the price differential has again reached Rs 10.93 after deregulation of diesel due to fall in global prices and no rise in excise duty or sales tax on diesel to maintain parity with petrol. Since both these fuels have been massively used in the transport sector over the decades, a lower price of diesel (by at least a difference of 35-40 per cent) always meant the cheaper, dirtier fuel remained the preferred fuel.

Price deregulation has narrowed the gap between petrol and diesel prices

Graph 17: Prices of diesel and CNG in Delhi, 2002-13

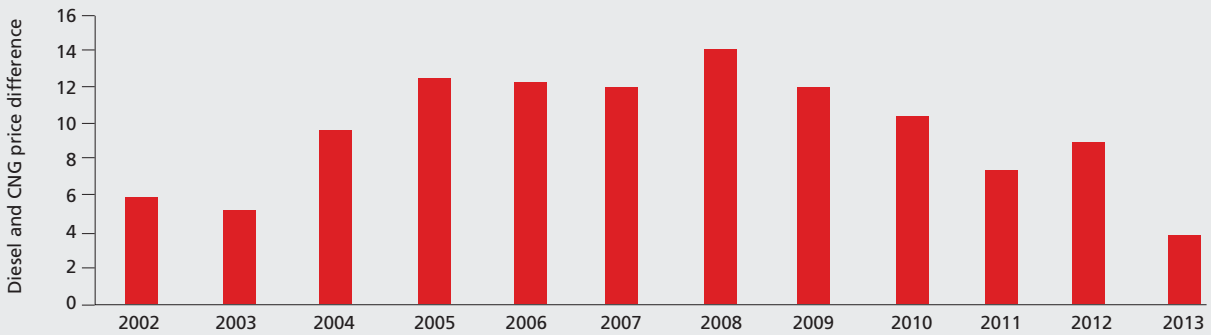
CNG and diesel prices have increased together, decreasing their price ratio



Source: Compiled from market sources

Graph 18: Price differential between CNG and diesel in Delhi, 2002-13

Was healthy in 2008 but has been decreasing alarmingly since then



Sources: Compiled from market sources

Price ratio, CNG/diesel in Delhi

2002-03 1/2
2011 4/5

Intervention is needed to reduce this ratio.

Cheap and low taxed diesel undermining CNG market: CNG was introduced in Delhi and in several other cities to reduce particulate pollution, especially toxic diesel emissions. To support this programme the Supreme Court had directed the national government in 2001 to adopt a favourable taxation policy. The Environment Pollution (Prevention and Control) Authority had suggested fiscal measures to keep CNG prices at least 30 per cent below diesel.

Over time the price gap has narrowed considerably hurting the programme. In 2002-03, CNG was cheaper than diesel by about 46.71 per cent. Between 2004 and 2009 the difference widened further to more than 50 per cent as diesel prices increased. But, in 2011, for the first time, the differential fell to 21.21 per cent. In December 2013, the price differential plummeted to 7.35 per cent. High fuel costs hurt public transport and undermine clean fuel programme (see Graph 17: *Prices of diesel and CNG, 2002-13* and Graph 18: *Price differential between CNG and diesel, 2002-13).*

Though the national government reduced CNG prices in April 2014, they will be raised again soon. Government of India should be directed to come up with a long-term favourable taxation policy to maintain at least a 30 per cent

NUMBER GAME

Automobile industry challenges official estimate of share of diesel use in cars

The Society for Indian Automobile Manufacturers (SIAM) aimed to prove that diesel cars use a negligible amount of the fuel. According to their estimate, personal cars, SUVs and taxis together consume only five per cent of the total diesel used in the country. Personal cars use less than one per cent.

But the government's own Petroleum Planning and Analysis Cell (PPAC) – and cited in the Planning Commission's Kirit Parikh Committee Report of 2010 – stated that diesel passenger cars use up 15 per cent of diesel and are the second largest users of the fuel in the country.

The SIAM estimates that were also cited in the 12th Planning Working Group on Petroleum Sector (WGP), reduced the share of diesel use by all the key sectors of the economy by creating a category called "others" that uses up more diesel than the power and industry sectors put together. This undefined category "others" – which is said to be guzzling 12 per cent of the total diesel used in the country – has not been accounted for by SIAM/WGP. By using this category, the relative share of the critical sectors of economy – transport, industry and power were reduced significantly.

Moreover, increase in the use of diesel in the country is not reflected in the transport sector. Strangely, even though overall diesel consumption has gone up since 2008-09, the share of road transport sector remains unchanged in the SIAM/WGP estimates. In 2008-09, the PPAC had estimated the total diesel consumption in the country at 51,700 thousand metric tonne (TMT). In 2011-12, SIAM/WGP estimates put the figure at 63,001 TMT – which was a 20 per cent jump. But this increase is not reflected in the SIAM/WGP estimate for the road transport sector.

Even the juggled numbers expose massive dieselisation of the car segment. Even at five per cent as the SIAM/WGP estimate, cars, taxis and jeeps are using up 3,276 TMT of diesel. Petrol cars are using about 4,272 TMT of petrol – a third of the total petrol consumed in the country. This means diesel fuel is already more than 40 per cent of the total fuel used in the car and SUV segment. The real concern is the rapid increase in the use of diesel in car and SUV segments. In 2010-11, the car industry sold about 800,000 diesel cars, a 32 per cent increase in sales over the previous year. Assuming a much moderate and flat growth rate of 20 per cent a year until 2020, the total diesel cars will be double the size of the total car sales today.

price differential between diesel and CNG and also accord priority to the transport sector for gas allocation in cities to address public health concerns in polluted cities.

Maintain at least
30%
price differential between diesel and CNG

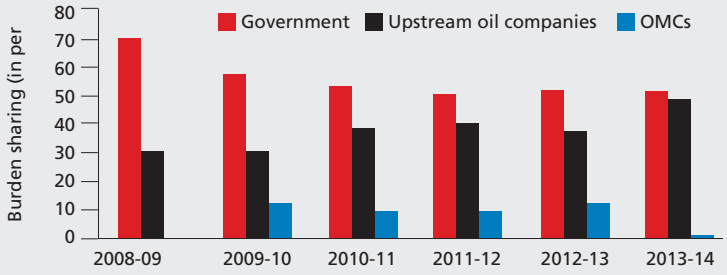
Under-recovery burden of the oil marketing companies: The Indian Oil Corporation, Bharat Petroleum and Hindustan Petroleum are the major oil companies that import and market oil in India. The difference between the desired price of a petroleum product for supply to OMCs' dealers and the government-regulated price of that product is referred to as gross under-recovery per unit of that product. This amount net of government subsidy is known as net under-recovery burden. The government was not bearing the complete gross under-recovery burden. Therefore, the net under-recovery burden was being shared between the upstream oil companies and the OMCs post the government subsidy. This method of gross under-recovery burden sharing however has no fixed approach and is determined on an ad-hoc basis by the government (see Graph 19: *Sharing of gross under-recovery burden*).

Such an onerous burden is unbearable in the wake of high international crude oil prices and sharp depreciation of Indian rupee against the US dollar.

In 2008-09, the OMCs were free of the gross under-recovery burden sharing. However, since 2009-10, they started to share this burden while the government

Graph 19: Sharing of gross under-recovery burden, 2008-09 to 2013-14

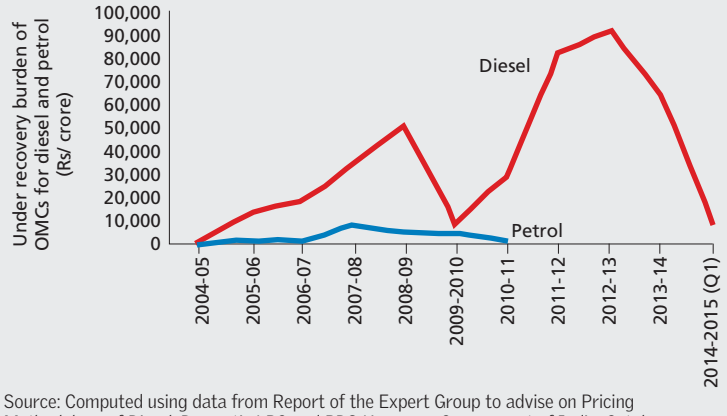
The share of gross under-recovery burden has been steadily off-loaded by the govenment on upstream oil companies



Source: Computed using data from Indian Petroleum and Natural Gas Statistics, 2012-13, Government of India, Ministry of Petroleum and Natural Gas, Economic Division, New Delhi, Indian Oil and Gas Sector – Upstream, ICRA Research Services, http://www.icra.in/Files/ticker/SH-2014-Q3-1-ICRA-Oil%20&%20Gas.pdf

Graph 20: Trend in net under-recovery burden of OMCs, 2004-05 to 2014

The net under-recovery burden of a fuel keeps increasing until deregulation of prices



Source: Computed using data from Report of the Expert Group to advise on Pricing Methodology of Diesel, Domestic LPG and PDS Kerosene, Government of India, October 2013, PPAC, http://ppac.org.in/WRITEREADDATA/PS_oil_prices.pdf, Source: http://ppac.org.in/content/150_1_Subsidy.aspx

share seemed to be on the decline. The upstream oil companies' share of this burden on the other hand was increasing. Some speculated effects of this burden-sharing arrangement included the rising fiscal deficits in India, limited expansion of exploration and development activities by upstream oil companies and adverse effects on the profitability of the OMCs.

It must be noted that the under-recovery burden for petrol has always been less than that of diesel. Owing to 100 per cent deregulation in the petrol prices from June 2010 onwards, the under-recovery for the same decreased in 2010-11 and was annulled thereafter, thus explaining the discontinuity on the plotted line for petrol prices (see Graph 20: *Trend in net under-recovery burden of OMCs*).

It is also interesting to note the sudden plunge in the diesel net under-recovery to the OMCs for the fiscal year 2009-10. This was due to the increased oil bonds/ government cash subsidy and the higher net under-recovery share of upstream companies during the same period.

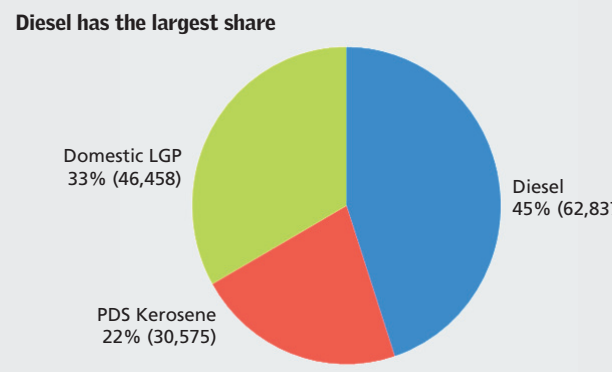
Some of the reasons attributed to this increasing under-recovery burden for diesel fuel despite gradual deregulation in its prices were the rising, always volatile, international prices and the depreciating rupee. Based on the estimates by Regency Energy Partners LP (RGP) as of October 1, 2013, increase of price in the Indian basket of crude oil by $one/bbl raises the net under-recovery burden of OMCs by around Rs 4500 crore. The effect of a Rs one depreciation in the rupee-dollar exchange rate, on the other hand, results in an increase in the same by approximately Rs 8000 crore. Given such high sensitivities of net under-recovery burden to these factors, one can imagine the amount of fluctuations and extent of increase in the same due to the depreciation of Indian rupee since September 2011 till today. This depreciation has brought the rate of the rupee vis-à-vis the dollar down from 47.64 to roughly 61.5 lately.

It is also important to comprehend the share of net under-recoveries by diesel vis-à-vis domestic LPG and PDS kerosene (see Graph 21: *Product-wise breakup of net under-recoveries to OMCs*). The major share (45 per cent) of under-recoveries by diesel highlights the high extent of regulation of the fuel by the government.

The staggering subsidy bill gives no other option but to slacken the price control.

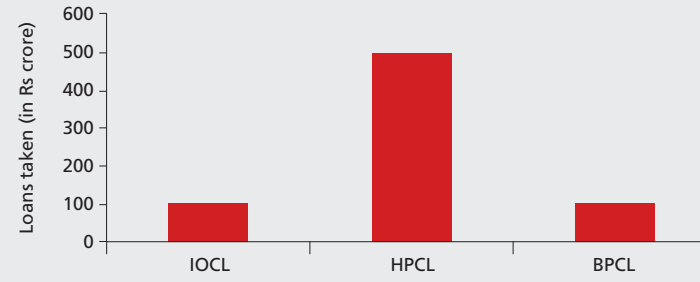
Normally, the government repays its share of the gross under-recovery burden directly to the OMCs by means of oil bonds/cash subsidy. However, it has been noted that there exists a time lag of about six to eight months in the OMCs receiving payments of the government's share of under-recoveries. Hence, the OMCs have to borrow additionally to meet their working capital requirements, resulting in an additional interest burden (see Graph 22: *Loans taken during the financial year 2011-12*). In 2012-13, OMCs incurred an additional interest burden of Rs 6000 crore due to this reason alone.

Graph 21: Product-wise breakup of net under-recoveries to OMCs, 2013-14 (Rs crore)



Source: Petroleum Planning and Analysis Cell, http://ppac.org.in/WRITEREADDATA/PS_oil_prices.pdf

Graph 22: Loans taken during the financial year 2011-12 (Rs crore)



Source: Computed using data from Petroleum Planning and Analysis Cell and individual companies' financial statistics

Not deregulating diesel prices is not an option: Not raising diesel prices may do greater harm to the economy, says the former member of Planning Commission Kirit Parikh, who has submitted a report to the Ministry of Finance based on his assessment of the impacts of decontrolled diesel prices. This assessment shows that large under-recovery will further increase fiscal deficit, enhance money supply, stoke inflation and interest rates, negatively affect investments and lower GDP. Inflation rates will be much higher if nothing is done about reducing under-recovery.

On the contrary, if diesel prices are raised, there will be some increase in prices but the economy will adjust in the short-run and witness more healthy growth in the long-run. Parikh has further noted that the impact of the increased prices on poor and the rich will be bearable. Diesel price accounted for around 60 per cent of the under-recovery or losses of the oil marketing. This can be mammoth on a nation-wide basis.

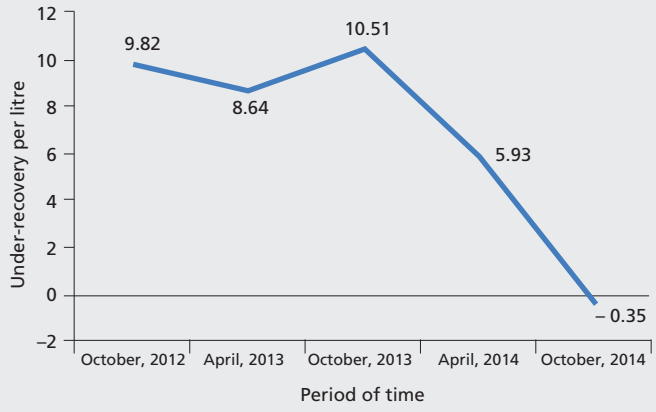
Decision to deregulate diesel prices: In 2013 the Government of India took the decision of completely dismantling the diesel subsidy. This was done in a phased manner. While the price of bulk purchase of diesel by bus companies, railways etc was increased by Rs 10 per litre at one go the retail prices were increased with a small monthly increase of Rs 0.50 per litre.

Finally, on October 18, 2014 the government took the final step to deregulate diesel fuel completely and align it with international oil prices. Diesel subsidies have finally been withdrawn by the government. Incidentally,

On October 18, 2014 the government took the final step to deregulate diesel fuel completely. Soon after diesel prices fell by Rs 3.37 per litre

Graph 23: Under-recovery per litre of diesel fuel, October 2012-October 2014

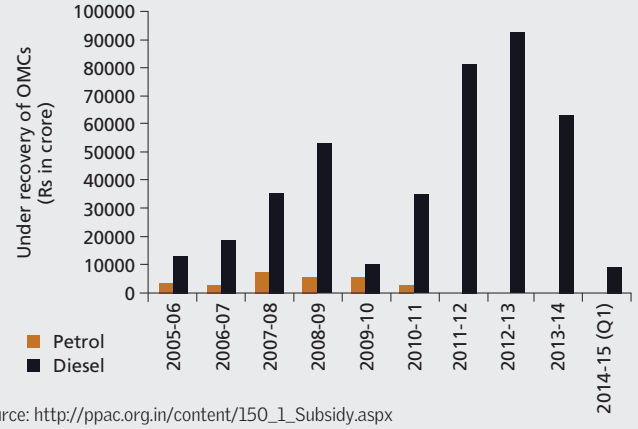
Since October 2012, the under-recovery of diesel has been decreasing



Source: Compiled from market information and media reports

Graph 24: Under-recovery burden of OMCs

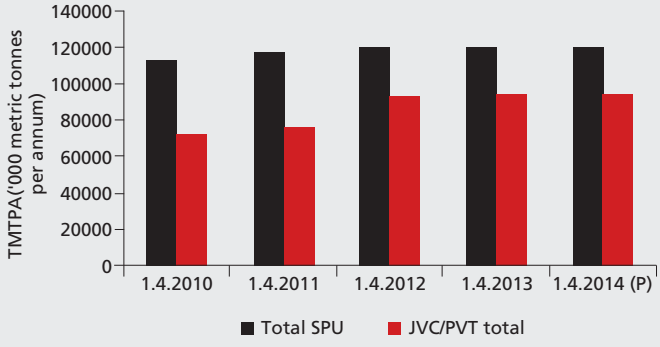
The under-recovery burden of OMCs is also lessening



Source: http://ppac.org.in/content/150_1_Subsidy.aspx

Graph 25: Refining capacity

The refining capacity in India has great potential to increase and employ new technology



Source: Computed using data from Petroleum Planning and Analysis Cell and individual companies' financial statistics

the decision to deregulate diesel came at a time when global prices for diesel are falling in the market. Soon after, diesel prices fell by Rs 3.37 per litre. The differential between petrol and diesel prices was also lowered.

Trends in under-recovery after deregulation: Due to declining international crude oil prices, the under-recovery per litre of diesel went skidding down to as low as 8 paise as of the first fortnight of September 2014. In the second fortnight of September 2014 this under-recovery turned into an over-recovery of 35 paise per litre of diesel creating profits for the OMCs (see Graph 23: *Under-recovery per litre of diesel fuel*). This has also attracted private players – Reliance and ESSAR – to India's domestic market. With the private players now in the field, public sector OMCs face stiff competition.

It may be noted that under-recovery on petrol continued only till June 25, 2010. It was deregulated and there was no role of government in petrol pricing thereafter. Currently, updated data for under-recovery on diesel post Quarter 1 of 2014 is unavailable (see Graph 24: *Under recovery burden of OMCs*).

With the recent decrease in prices of international crude oil and the deregulation of diesel price, the under-recovery has transformed into over-recovery for the OMCs resulting in drastic fall in the overall under-recovery burden for the economy. According to ICRA, if crude prices remain low for the rest of the financial year 2014-15, under-recoveries would fall to around Rs 90,000 crore and those on diesel would fall to almost one-fourth, to Rs 15,000 crore this fiscal year, from Rs 62,800 crore in FY14.

According to a recent estimate by IMF, India's fiscal deficit is expected to rise to 8.5 per cent of the GDP in the financial year 2014. While the fiscal deficit in the country has been on the rise, the refining capacity of the upstream

companies and the profit after tax of OMCs have also been on the rise for the past couple of years despite growing under-recoveries (see Graph 25: *Refining Capacity* and Graph 26: *Profit after tax*).

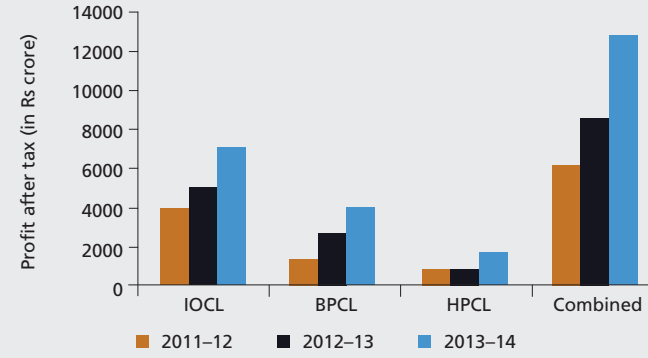
The bottom line is that with deregulation both private and public sector refineries now have a level playing field in Indian market. This was not the case earlier as the price caps had virtually outpriced the private players. Therefore, deregulation is also an opportunity to get both private and public sector players to compete to introduce clean fuels quickly and acclerate clean fuel transition. Local capacities have already been created in the private sector to produce 10 ppm sulphur fuels to cater to the European and other advanced markets. India needs regulations to leverage that for improving the domestic market for clean fuels.

The challenge of fuel taxation: Even though subsidy has been removed the government has continued with the policy of maintaining a wide differential between taxes on diesel and petrol. This differential is maintained at both central and state level. While the central government fixes the central excise duty, the state governments are in charge of sales and VAT. There is also enormous variability among state taxes. All these together have a cascading impact on the final retail prices that influence consumer choice.

Central excise duties on diesel and petrol: The government of India relies on petroleum products for almost 40 per cent of its earnings from customs and excise levies; while almost 1/3rd of its total sales tax revenue comes from petroleum products. Currently, the excise duties on non-branded petrol and diesel in India are Rs 9.20/litre and Rs 3.46/litre respectively (see Graph 27: *Excise duty on non-branded petrol and diesel between 2010 and present* and Graph 28: *Excise duty on branded petrol and diesel between 2010 and present*).

Graph 26: Profit after tax (Rs crore)

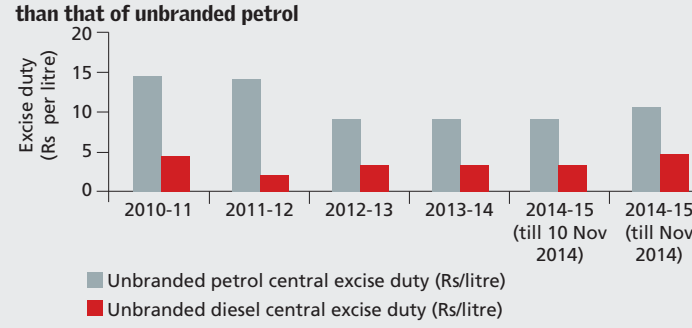
Profits have increased partly because the gross under-recovery burden of diesel has decreased



Source: Computed using data from Petroleum Planning and Analysis Cell and individual companies' financial statistics, http://petroleum.nic.in/docs/pngstat.pdf

Graph 27: Excise duty on non-branded petrol and diesel between 2010 and present

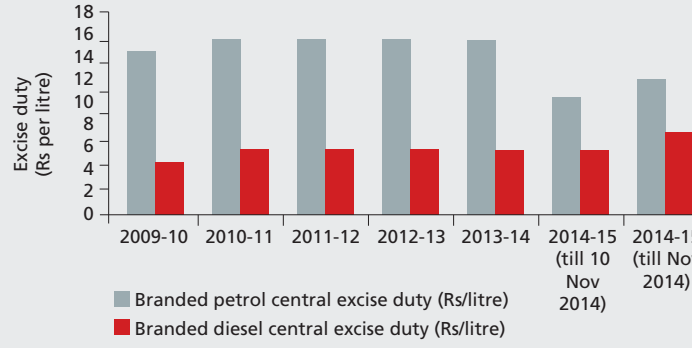
Excise duty of unbranded diesel has been increasing, but is still much lower than that of unbranded petrol



Source: Compiled by CSE from statistics on petroleum and natural gas (2011-12); Government of India Budget 2009-10, 2010-11; Hindustan Times article 'Petrol-Diesel Excise duty hiked by Rs 1.50 per litre) 2014 (http://www.hindustantimes.com/business-news/petrol-diesel-excise-duty-hiked-by-rs-1-50-ltr/article1-1285610.aspx)

Graph 28: Excise duty on branded petrol and diesel between 2010 and present

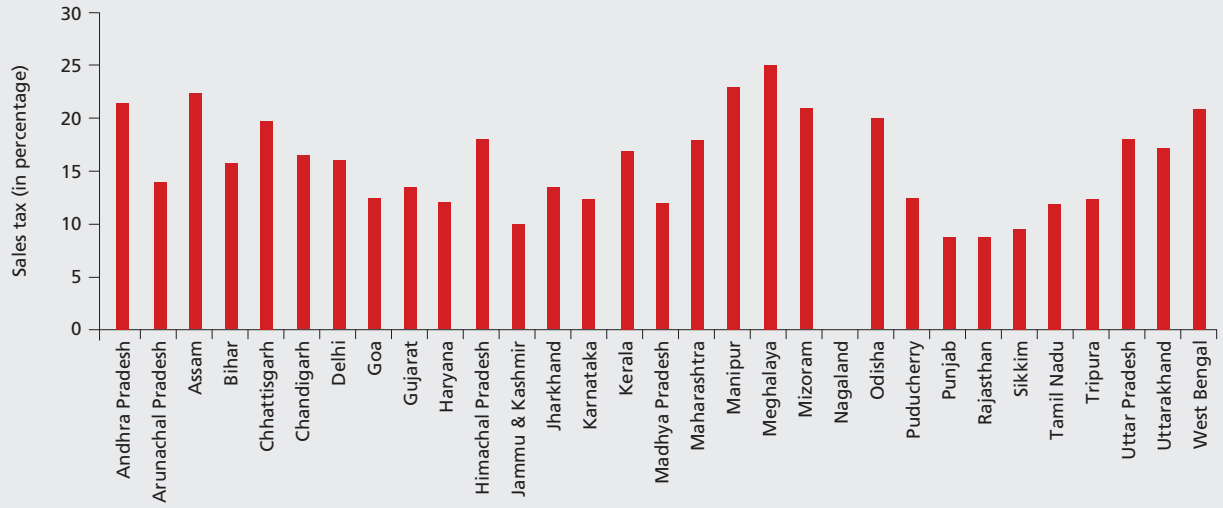
Excise duty of branded diesel, too, is lower than that of branded petrol



Source: Data compiled by CSE from Union Budget government of India (2009-10, 2010-11), Indian Petroleum and Natural Gas Statistics (2013-14)

Graph 29: Sales tax on diesel across states in India

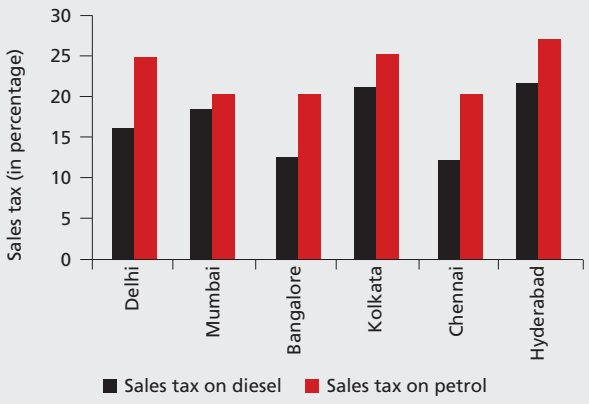
The fact that every state has its own sales tax regime on fuel oils is a hurdle in forming a larger national policy



Source: http://petroleum.nic.in/docs/pngstat.pdf

Graph 30: Sales tax in metropolitan cities

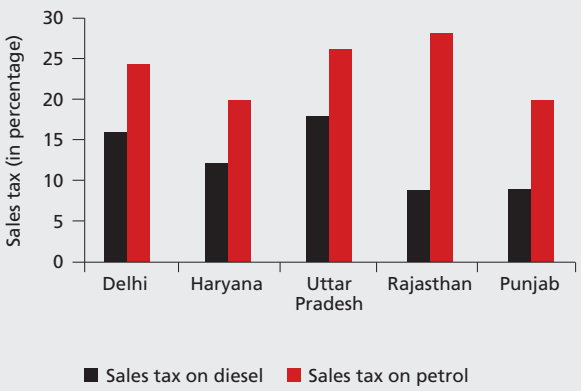
Cities like Delhi and Chennai, with a yawning gap between the sales taxes of diesel and petrol, invite dieselisation



Note: Sales Tax rates as on 1st April, 2014
SOURCE: Data compiled by CSE from Indian Petroleum and Natural Gas Statistics (2013-14)

Graph 31: Sales tax in Delhi and its neighbouring states

But the sales tax differential in Delhi is still better than that in Rajasthan and Punjab



NOTE: Sales Tax rates as on 1st April, 2014
SOURCE: Data compiled by CSE from Indian Petroleum and Natural Gas Statistics (2013-14)

The excise on petrol was reduced recently when overall prices had reduced in the international market.

Wide variations in sales tax between states: There is a wide variation in the sales tax on diesel in different states. While the sales tax is the same as a value added tax in theory, there is a lot of difference between the two taxes in reality. There is an agreement between the federal government and the provincial governments to keep petrol, diesel, LPG, kerosene, bitumen and some other

fuels out of the VAT framework. This triggers a cascading effect as well. (See Graph 29: *Sales tax on diesel across states in India*).

Currently, there is extreme disparity between sales tax for diesel and petrol in different states of India as shown (see Graph 30: *Sales tax in metropolitan cities*; Graph 31: *Sales tax in Delhi and its neighbouring states*).

Cities like Hyderabad, Kolkata and Mumbai have set a good example of reducing the sales tax differential between the two fuels.

Sales tax on petrol is as high as 28 per cent, 26 per cent and 24.5 per cent in Rajasthan, Uttar Pradesh and Delhi respectively while it is as low as 8.75 per cent and 8.8 per cent on diesel in Rajasthan and Punjab. This gives an additional reason for consumers to switch to diesel run cars. This also shifts demand to low tax regions.

The only states that do not maintain a noticeable difefrential between petrol and diesel taxes are Odisha, Chhattisgarh and Goa. This is a good practice and worth emulating in other states.

As of now there is no official proposal to equalise taxes of fuels either at national or at the state level. But this will have to be addressed urgently. Fiscal experts, too, demand such equalisation. In his report, Kirit Parikh states that there is a need to remove the tax differential between petrol and diesel because it is leading to dieselisation at an unsustainable rate. ■

States that do not maintain price differential between petrol and diesel are Odisha, Chhattisgarh and Goa

3. Making diesel pay its dues

Fuel pricing and taxation has therefore led to considerable distortion in the fuel and vehicle markets. This presents the challenge of crafting fiscal measures that will help to remove differential between petrol and diesel prices and also generate additional funds that can be deployed to meet the refinery costs to produce clean diesel.

Various estimates available from oil companies estimate the investments for producing clean fuel between Rs 60,000 crore to Rs 80,000 crore. So far, under-recovery and subsidy burden had made investments in refinery upgradation difficult. Even though the subsidies are gone now, there is a concern that unless additional fiscal strategy is put in place clean fuel production will be put on hold.

It is therefore possible and also desirable that a fiscal policy is devised based on polluter pays principle to tax the bad and fund the good. This can include additional taxation measures to disincentivise diesel cars as well. Wide tax differential between diesel and petrol prices would still fan dieselisation of the car segment based on poor-quality diesel fuel and technology and complicate the toxic and environmental risk.

Fiscal strategy for clean fuel fund

For the first time there is an official proposal to frame fiscal measures to generate fund for clean fuel production. The Government of India had set up an Auto Fuel Policy committee in 2012 to recommend the next stage of emissions standards roadmap for the country until the year 2025. This report, submitted in 2014, while recommending introduction of 10 ppm sulphur diesel and Euro V emissions standards in 2020 and Euro VI in 2025 has also recommended a slew of fiscal measures to meet the cost of refining clean fuels.

The Auto Fuel Policy Committee has recommended that the retail price of the current Euro III (or Bharat Stage III) fuel should be made equal to that of Euro IV (or Bharat Stage BS IV) fuel.

The committee has proposed to levy a "special fuel upgradation cess" of 75 paise per litre on all petrol and diesel sold in the country for seven years up to 2021. Assuming that this cess can be made effective from July 1, 2014, then over the course of the next seven years a total of Rs 64,000 crore would be collected, assuming a modest rate of annual growth in domestic consumption. This cess will accrue to the Oil India Development Board (OIDB) which will make the funds available to the oil companies for investments which are necessary to achieve the upgrading of quality of fuel produced. After seven years, this cess will be discontinued.

The committee has also recommended that the retail price of Bharat Stage III fuel (Euro III) should be made equal to Bharat Stage IV (Euro IV) fuel. It has been separately recommended that the quality differential in price as

Auto Fuel Policy Committee has proposed Special Fuel Upgradation Cess

75 paise/litre on petrol and diesel

And revenue from price differential between Bharat Stage III and Bharat Stage IV to be called fuels High Sulphur Cess to create

Clean Fuel Fund

between the two grades of fuel should be 75 paise per litre; therefore the excess collected by re-pricing of Bharat Stage III fuel would also be 75 paise per litre. However, this amount should not go to the oil companies but accrue as a cess to the OIDB. The cess may be called "high sulphur cess", since that is what it is in fact; and in order to distinguish it from the "fuel upgradation cess". The amounts collected as "high sulphur cess" will rapidly decline as the three-phase rollout to complete Bharat Stage IV standards is completed and will end in early 2017. Assuming it is made effective from July 2014, the total collections before full rollout of Bharat Stage IV will be of the order of Rs 10,000 crore.

The collections to the OIDB on account of both the "special fuel upgradation cess" and the "high sulphur cess" will thus be of the order of Rs 74,000 crore, which comes close to the estimate of Rs 80,000 crore referred to above required to meaningfully relax the financial constraints that can enable the refineries to proceed.

Unfortunately, this proposal that was tabled for implementation early this year has not been notified yet. It is therefore not clear whether these recommendations have official backing and a legal mandate. Quick decisions on this are the need of the hour if we are to be able to adhere to the timeline proposed for introduction of improved emissions standards and to also ensure further tighteining of the timeline.

It may also be noted that clean diesel is needed just not for cars but also for captive users like trucks and buses. During the 12th plan, our refinery capacity is slated to increase 1.6 times. This new investments must be linked with clean diesel production.

Uncontrolled dieselisation hurts refineries as well. Even refinery economics get burdensome if automotive use of diesel explodes. Total diesel consumption is already 4.6 times higher than petrol consumption. If this skews further, refineries will be compelled to fractionate more diesel – even beyond the optimum balance with other refinery products. More secondary refining of heavier petroleum end-products will lead to more energy losses and add to the refinery costs. Europe is already debating this. To this is added the challenge of producing clean diesel that is a non-negotiable public health agenda. Rigidity in investments must not inhibit refinery upgrades and production of clean diesel.

Total diesel consumption
4.6 times higher
than petrol consumption

Tax measures to cut dieselisation of car segment

Principally, it is not acceptable to maintain wide tax differential between diesel and petrol fuels. This has completely skewed the end use – the vehicle market. The government has begun to increase excise duty on petrol and diesel. But it now needs to rationalise the taxes further to close gaps between their prices.

It may also be noted that increased use of diesel by cars means greater revenue losses due to the under-priced and under-taxed fuel – with each litre of petrol replaced by diesel to run a car, the excise earnings of the government drop by almost three times. With each litre of diesel replaced with petrol, excise revenue drops seven times. Diesel guzzled by new diesel cars sold in 2010-11 – when dieselisation was peaking – has cost the central government an estimated Rs 800 crore in fuel excise losses. From the existing fleet of all diesel cars and SUVs, the loss is staggering: close to Rs 3,000 crore. This excise loss will compound with high annual sales, while losses from other central and state

The Kirit Parikh Committee has recommended an additional excise duty of

Rs 81,000

on every diesel car

taxes are not even accounted for. At every stage of price build-up – pre-tax adjustments, dealer commission, state taxes – the fuel price gap grows wider.

It is not clear how soon the government will be willing or able to push decisions to equalise the tax and prices of petrol and diesel at retail level. This therefore demands additional taxation measures for the end use of diesel in cars. This can take the form of environmental tax or additional excise duty on diesel cars to nullify the perverse benefits of cheaper low tax diesel. It may also include annual taxes to nullify the gains of lower running costs.

In 2010 the Kirit Parikh panel report on petroleum pricing had proposed an additional excise duty of Rs 81,000 on diesel cars to equalise the excise tax burden on petrol car. The panel also proposed to deregulate fuel prices to allow them to move freely with the international pricing trends. But it did not propose to rationalise and equalise skewed taxes on the two fuels. This was then justified as tax differential in the name of agriculture and freight though rich car owners are the bigger beneficiary.

The panel acknowledged that higher excise duty on petrol compared to diesel was encouraging diesel cars. The proposed Rs 81,000 additional excise duty to correspond to the differential with higher excise on petrol was expected to act as "the equaliser". While this proposed amount of additional tax on diesel cars still has scope of being refined as a principle this has not been implemented yet.

If the government fails to put the fiscal brakes in its budget, investment in diesel car facilities will continue. This would also make automobile industry more resistant to emissions improvement and undermine the negotiating power of the regulator to push for tighter emissions standards. ■

4. What are other governments doing?

Globally several governments have started to frame regulatory and fiscal measures to discourage diesel cars and also incentivise clean diesel production. This provides the template for policy action that India can learn from.

Action on diesel cars

Several developing countries have discouraged diesel cars. In Brazil diesel cars are not allowed because of the policy to keep taxes lower on diesel. In China, taxes do not differentiate between petrol and diesel. Diesel cars constitute less than one per cent of all cars in China. As a pollution control measure Beijing has not been allowing diesel cars since 2003. Sri Lanka has imposed several times higher duties on diesel cars compared to petrol cars and has reduced diesel car sales.

In Denmark, Germany and several other European countries the tax on diesel cars, including annual taxes, is higher than on petrol cars. Also, in cities like Paris, diesel car operations are not allowed to reduce the peak pollution levels during severe smog days. This brands diesel cars as more polluting. France in December 2014 made a dramatic announcement that it would gradually phase out the use of diesel fuel for passenger cars and will put in place a system to identify the most polluting vehicles. "In France, we have long favoured the diesel engine. This was a mistake, and we will progressively undo that, intelligently and pragmatically," French Prime Minister Manuel Valls is reported to have said in a speech. It has now been reported that the French government, which owns about 15 per cent of carmakers Renault and PSA Peugeot Citroën, has pledged to "progressively" ban from 2015 diesel vehicles – which account for two-thirds of car sales in the country and almost two-thirds of Renault and Peugeot's European sales.

Other governments are also adopting tax incentive measures for cleaner vehicles. The UK has vehicle targeted incentive. In 1998-99, the UK reduced the vehicle excise duty of £500 for heavy-duty diesel vehicles with particulate traps and other pollutant abatement technologies (meeting a preexisting Reduced Pollution Certificate qualification). The Vehicle Excise Duty reduction increased to £100,021. The incentives for cleaner fuel and cleaner vehicles worked together to promote a rapid shift.

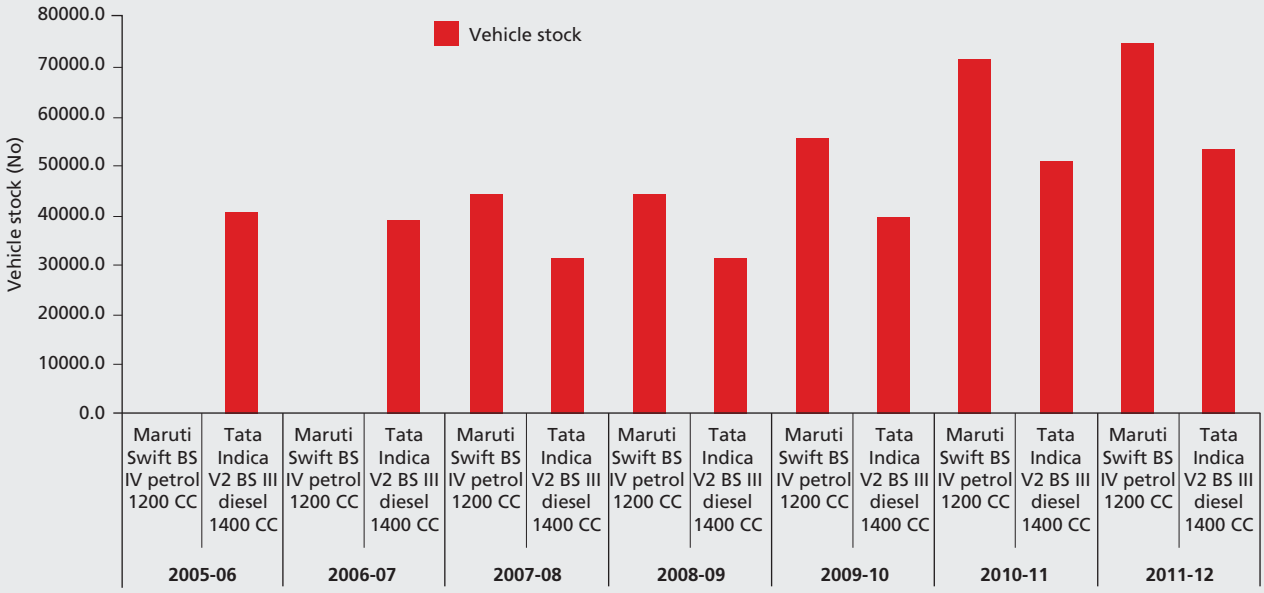
Regulatory efforts are combined with a limited tax incentive issued to customers for the purchase of advanced lean-burn technology diesel vehicles ranging from US $1,300 to $1,800 beginning in 2008. The tax

International action on diesel cars

- **Brazil** Not allowed by law
- **China** Equal taxes on petrol and diesel
- **Beijing** has banned diesel cars
- **Lanka** Higher import duties
- **Denmark** Annual tax
- **Paris** Proposed to ban diesel cars

Graph 34: Rise in petrol and diesel car prices

The increase in petrol car prices is sharper compared to diesel car prices



Source: Computed by using data from cardekho.com

incentive is gradually phased out after the manufacturer reports the sale of the 60,000th vehicle.

Need action in India: In India several official committees have asked for special and additional taxes on diesel cars to neutralise the incentive of cheaper fuel.

Vehicle industry in India may be incentivised to move to Euro VI within a tight timeframe. For vehicle industry the new technologies have been demonstrated in other regions for several years. India has time until 2020 to move to Euro VI. It is more cost effective to design and implement the complete system in one step rather than two.

So far only very small steps have been taken to marginally increase taxes on SUVs through various budgetary provisions in India. One such increase was made in the budget of 2012 but it was subsequently withdrawn in the 2013 budget under pressure from automobile companies. The government now needs to take bolder steps to discourage use of low tax diesel in cars. This will ensure that it does not lose revenue from same end use as that of petrol and reduce the risk of toxics in cities.

Though there is a price differential between petrol and diesel cars, with price of diesel variant a little higher than petrol models, this has not discouraged dieselisation as the lower running cost owing to lower diesel fuel prices has remained attractive. Moreover, during the past decade both diesel cars and petrol cars have experienced increase in prices. For instance, a diesel car of engine capacity 1400 CC has witnessed an increase from Rs. 2.92 lakhs

to 3.38 lakhs, an increase of 16 per cent. A petrol car of engine capacity 1200 CC has registered an increase in price from Rs. 3.5 lakhs to Rs. 4.5 lakhs, an increase of 29 per cent; roughly double that of a similar diesel car segment (see Graph 34: *Rise in petrol and diesel car prices*). The market has absorbed the higher prices. Therefore incremental increase in prices owing to improvement in emissions standards must not deter stringent timeline for emissions improvement.

It may however be noted that there are governments in Asia – Chinese cities – as well as Europe, where fiscal measures including taxes and road pricing policies are being applied to make ownership and usage of cars more expensive to recover the cost of societal and environmental harm that cars impose on society.

Japan, Hong Kong, Germany, the UK and the US have eliminated high-sulphur diesel through fiscal measures

Strategies for clean fuels

Several governments have innovated fiscal strategy to phase in clean fuels. These strategies include setting of differentiated tax rates; tax reduction/ credits to refiners that provide lower sulphur fuels; directly subsidising the supply of lower sulphur fuels; incentives targeting consumers, such as tax reductions implemented at the pump – combined with an increased tax at the pump for higher sulphur diesel.

Fiscal incentives must be combined with regulatory mandates on clean fuel quality (10 ppm sulphur fuels) for public health and environmental benefits. This should also be leveraged to leapfrog emissions standards within a tight time frame.

Japan: Tax incentive to refineries: The government instituted direct tax incentives in two phases to subsidise refinery investments for reducing sulphur in diesel. Refineries had a choice of a seven per cent deduction in corporate tax or a 30 per cent accelerated depreciation on the purchased equipment. The Tokyo government initiated a two-year incentive program in 2001 to subsidise up to 10 yen per litre to oil companies that supply 50-ppm sulphur diesel fuel.

Hong Kong: Tax differential in favour of clean fuel: To promote the supply of 50-ppm diesel fuel, in July 2000, the government reduced the import duty for 50-ppm sulphur diesel to HK $1.11 per litre. Within two months, 50-ppm sulphur diesel became the main diesel fuel at local filling stations. The following year – although the duty on 50-ppm sulphur diesel rose – the tax differential between the two fuel types (500-ppm vs. 50-ppm) remained at HK $0.89 per litre.

The Hong Kong Environmental Protection Department in 2007 issued a HK $0.56 per liter concessionary duty to promote market penetration of 10-ppm sulphur diesel fuel in anticipation of implementing Euro V requirement for all diesel vehicles in 2009. By mid-2008, the duty rate for 10-ppm sulphur diesel was waived altogether and filling stations began to exclusively carry this fuel. The government continued to waive the concessionary duty for 10-ppm sulphur diesel fuel even after the 10-ppm sulphur limit was mandated in July 2010.

The UK: Duty differential in favour of clean fuel: The conversion of high-sulphur diesel fuel to 50-ppm was achieved six years ahead of the EU schedule

and well ahead of most other EU member states. This can largely be attributed to a series of 50-ppm diesel tax incentives. Beginning in the fiscal year 1997, the tax differential was set at 1 pence per liter, and the amount ratcheted up each year until full market penetration of 50-ppm diesel in the market was achieved.

Germany: Duty differential in favour of clean fuel: The government issued an extra tax of 3 pfennigs/litre on fuel with a higher-than-50ppm sulphur level beginning in 2001, then extended to three pfennigs/litre extra tax on fuel with higher than 10-ppm sulphur content from January 1, 2003. In 2004, virtually all fuel sold in Germany contained 10-ppm sulphur with minimal and short-lived fuel price disruption due to competition and gains in efficiency from refining technology.

The US: The government did provide some flexibility to assist refiners in meeting targets such as allowing credit trading among refiners and extension of the target deadline for small refineries. From fiscal years 2003 – 2009, a tax credit of $ 0.05 per gallon of 15-ppm diesel was granted to small business refiners.

Delhi has succeeded in creating a dedicated Air Ambience Fund out of revenue from the environment cess imposed on diesel sold in Delhi
Cess of Rs 0.25/litre

India needs to act: India can adopt direct tax incentive, one time capital subsidy and differential pricing. Earlier differentiated retail prices for clean and dirtier fuel would not have been effective as price caps could make investments rigid. But this is possible now. Additional tax on diesel cars or differentiated tax on all cars and fuels and that can help to offset the subsidy and revenue shortfall from tax concession. A dedicated fund can be created from this revenue to cover the cost of refinery upgrade within a short time frame. Even a small cess on each litre of fuel sold can help to offset costs.

In fact, in India, Delhi has taken the lead to apply polluter pays principle and imposed an environment cess on diesel fuel sold in Delhi. The revenue from this small cess – only Rs 0.25 per litre – has been used to create a sizeable amount of dedicated fund called Air Ambience Fund that is available to finance pollution control measures in Delhi. This cess notified under the Air Act is an important step forward and should be leveraged for a more upscaled action across the country.

There is now considerable curiosity among the market watchers to know if the recent process of deregulation and therefore consequent reduction in price differential can make any dent in dieselisation. IRADe head Kirit Parikh has carried out an analysis of this trend. His draft report states that the share of new diesel car sales at 47 per cent in 2012 has dropped to 38 per cent in 2014. With increased prices it will take longer for the car owners to recover the premium paid for diesel cars. This is a positive sign and also an indicator of the potential of fiscal measures to contain dieselisation. ■

5. Oil cuts oil

It is necessary to explore various potential strategies that are possible to mop up additional revenue to fund the transition as well as disincentivise dieselisation. The Centre for Science and Environment has reviewed a few possible strategies to indicate the enormous potential of measures that can help to generate additional funds and create clean fuel fund for emissions control. Three possible options have been assessed to indicate the potential of such instruments.

Need fiscal measures:

- **Rs two hike in excise on fuels can generate more than Rs 50,000 core over five years**
- **Fuel cess of Rs 1/litre Rs 40,000 crore over five years**
- **Additional duty on diesel cars Rs 10,000 crore**

CASE 1: Increasing and equalising the excise duty of petrol and diesel

Ever since the deregulation the government has increased and rightly so, the excise duty on both petrol and diesel. Diesel has excise duty of Rs 7.96/litre with additional education cess of Rs 5.11/litre. In case of petrol the excise duty is Rs 14.95/litre with education cess of Rs 11.02/litre. On January 1, 2015, while increasing the excide duty on fuels, the Ministry of Finance issued a release stating, "In order to fund the ambitious infrastructure development programme of the Government, particularly the building of 15000 kms of roads, during current and next financial year, the Government has decided to increase basic excise duty on petrol and diesel (both branded and unbranded) by Rs two per litre." If such a step can be taken to build roads, it can also be leveraged to protect public health. However, in this case though the taxes have been increased the differential still remains wide. This gap has to close.

This Rs two hike in excise at the level of fuel consumption recorded during 2013-14 can generate additional revenue of Rs Rs 21,200 crore a year. If half of this is taken to the clean fuel fund, over the next five years, at least Rs 53,000 crore can be generated for clean fuel fund.

However, equalising the excise duty on diesel with petrol will generate more revenue as well as remove differential that fans demand for diesel cars.

CASE 2: Imposing a clean fuel cess

Imposing a clean fuel cess of Rs one/litre of diesel will generate a revenue of about Rs 8,300 crore in a year. In case the same cess is imposed on petrol it will generate an additional revenue of about Rs 2,300 crore in a year. So a total of about Rs 10,600 crore revenue can be generated a year. In five years this can bring at least Rs 53,000 crore.

CASE 3: Imposing additional duty on diesel cars

Kirit Parikh Committee suggested an additional specific duty on diesel cars to prevent the current rapid rate of dieselisation in India. The committee had suggested an additional excise duty of Rs 81,000 per car as a tax equaliser. The total number of passenger vehicles, including cars and SUVs, sold in the country as per latest available SIAM data (for 2012-13) is 2,686,429 . Of this,

Table 2: Proposed final adjusted additional duty on diesel cars

Car engine size	Final adjusted additional duty on diesel cars
<1400 cc	Rs 81,000 per car
>1400 cc	Rs 1.62 lakh per car

Source: CSE recommendation

50 per cent are considered to be diesel cars and SUVs – so by imposing Rs 81,000 per car the government will generate revenue of about Rs 10,000 crore annually. So in the next five years this measure can generate a revenue of Rs 50,000 crore.

If this strategy is further refined to double the amount of additional duty for the bigger cars and SUVs the potential of revenue generation can increase further and also check dieselisation (see Table 2: *Proposed final adjusted additional duty on diesel cars*).

The public policy to support rich car owners with lower taxes on diesel cars need to stop. Official committees (Raja Chelliah 2004, Chaturvedi 2008, Kirit Parikh 2010, Interim report on low carbon economy of Planning Commission 2011 etc.) have repeatedly recommended additional taxes on diesel to neutralise the effect of the cheaper diesel fuel. Kirit Parikh supports taxing of the dirtier fuels by means of introduction of a pollution tax, the burden of which must be transferred to the end user of this dirty fuel, which would be mostly automobile users. But the issue remains unresolved. Given the public health concerns and economic backlash this decision cannot be delayed any further.

The way forward

It is now very clear that tax distortions beget more such distortions and come at serious societal and public health costs. But addressing societal and public health risk has not been the goal of India's fuel tax policy till now. Fuel taxes are a typically easy source of income for the government of any developing economy as the earnings are limited from its narrow base of direct taxes. In India, too, fuel taxes are close to one fifth of the total tax receipts. Therefore, the usual buzz on fuel pricing is always about economic price stabilisation and not about public health and energy security benefits and economic savings from it.

This has to change. The tax differential acts like a "subsidy" for diesel cars. As diesel can be easily substituted with petrol in cars, the revenue losses from each litre of diesel that replaces a litre of petrol in a car is enormous.

It is important to introduce fiscal strategies to off-put conventional diesel, hasten clean diesel and dampen fuel guzzling. While luxury consumption of diesel in cars can be cut, trucks, buses and other commercial vehicles will still be the captive users of diesel and continue to spew deadly toxics into the air we breath. India's vision to revolutionise public transport for clean air, health and energy security will also have to be powered by clean fuels.

Impose an environment tax on diesel cars and cess on fuel to create a Clean Fuel Fund

Provide fiscal support for clean fuel production

The Auto Fuel Policy Committee has already put the bargain on the table: that clean fuel will cost a lot of money and oil companies can produce clean fuel particularly clean diesel only if there is fiscal support facilitated by a clean fuel fund. This fund can be created from additional cess on fuels and from the additional revenue that is possible by removing the current price differential between Bharat Stage III and Bharat Stage IV emissions standards.

It is also encouraging that the Central Government in its affidavit to the Supreme Court in the ongoing public interest litigation on air pollution in Delhi has submitted that it is willing to consider introducing Euro VI emissions standards in 2020. This is an opportunity to accelerate the roadmap. The government must legally mandate this. Therefore the Union Ministry of Petroleum and Natural Gas as well as the Union Ministry of Finance will have

to take quick decisions to find ways to provide fiscal support to enable clean fuel production within a tight timeframe. Cost cannot be an excuse to delay the emissions standards roadmap. Public health cost of dieselisation is too high to ignore fiscal solutions.

The agenda for regulatory action and fiscal solutions to reduce public health and climate impact of dieselisation:

Equalise excise duty on petrol and diesel

Disincentivise diesel cars by imposing additional taxes

Link fiscal solutions with stringent emissions standards roadmap: The Union Ministry of Petroleum and Natural Gas needs to further tighten the proposed roadmap from the Auto Fuel Policy Committee and immediately notify the emissions standards roadmap. The Auto Fuel Policy Committee has proposed nation-wide introduction of Euro IV emissions standards by 2017-18; Euro V with 10 ppm sulphur fuels by 2020-21; and Euro VI emissions standards by 2024-25. This timeline may be further tightened to be able to introduce Bharat Stage IV nation-wide by 2015; Euro V in 2017 and leapfrog to Euro VI by 2020. As mentioned earlier, the Union Government in its affidavit to the Supreme Court in the ongoing air pollution case in Delhi has indicated the possibility of introducing Euro VI by 2020. This should be immediately mandated. Simultaneously, a clean fuel fund needs to be set up to enable this transition. The proposal of high sulphur tax on fuels and tapping of additional revenue from price equalisation of Bharat Stage III and Bharat Stage IV should be put in place to create the fund.

Equalise central excise duty on petrol and diesel and direct state governments to lower tax differential to equalise prices at the retail end: The Union Ministry of Finance and the Union Ministry of Petroleum and Natural Gas together need to chart an action plan to move towards tax equalisation of fuels. It is possible to do so by adjusting both petrol and diesel taxes in a revenue-neutral manner. A small cut in petrol excise can be easily compensated by a small increase in diesel excise. Studies have shown that the trucking – which is often cited as a reason for not changing diesel prices – has higher elasticity for the trend in GDP and less for diesel prices. The current low prices of fuel is an opportunity to move in this direction.

Disincentivise diesel cars with additional taxes: The Union Ministry of Finance may frame a scheme of imposing additional excise duty or an environmental cess on cars. Principally, low tax fuel and polluting fuel should not be encouraged for use in personal cars. Dieselisation of the car segment should be discouraged because it has other choices of fuels. An additional tax upfront at the time of purchase and also an annual tax can be effective in nullifying the perverse benefits for car owners and other users stemming from low taxed diesel. Furthermore, state taxes can be rationalised to address this issue.

Implement fiscal strategies to create clean fuel fund to meet the cost of clean fuel: The Union Ministry of Finance and Union Ministry of Petroleum and Natural Gas need to implement fiscal strategies to create a dedicated clean fuel fund to enable Indian public sector refineries to meet the cost of refinery upgrades to meet clean fuel benchmark of 10 ppm sulphur fuel and related parameters by 2018-19.

Fuel pricing and tax reforms cannot happen in isolation, cut off from the concerns over public health, energy and climate

Indian refineries face the challenge of making a quick transition to clean fuels (10 ppm sulphur fuels along with tighter benchmarks for other fuel parameters) within a short time frame. While the refineries will have to be held accountable for adhering to a strict deadline, additional steps can also be taken to help fund the transition. This principle has already been taken on board by the Auto Fuel Policy Committee. The committee has recommended a few measures including differential pricing of Bharat Stage III and Bharat Stage IV fuels and additional cess on fuels to generate additional revenue and create a dedicated clean fuel fund. These and more measures as practised globally and also assessed in this paper, including differential taxation of clean and dirty fuels, capital subsidy to the refiners etc., can be explored and adopted for implementation in India. These, as assessed by the Centre for Science and Environment, have enormous potential to meet the refinery costs and roll out clean diesel quickly. This is urgently needed to implement Euro V and Euro VI emissions standards by 2020. Only at these levels of emissions standards effective emissions control technologies are possible in diesel vehicles to reduce toxic and warming particulate matter. Euro VI levels the emissions norms for diesel and petrol cars to a point where emissions become fuel neutral.

The deregulation of diesel prices have helped OMCs improve earnings. If the government puts in place taxation mechanism to create a fund for clean diesel fuel production it can accelerate the process.

India cannot delay decisions on a roadmap of emissions standards and the fiscal strategy to meet the cost of transition as well as to remove market distortions owing to skewed price differential between petrol and diesel. The message is clear. Fuel pricing and tax reforms cannot happen in isolation, cut off from the concerns over public health, energy and climate. ■

References

- Anand Mukesh 2012, *Diesel pricing in India: Entangled in policy maze,* National Institute of Public Finance and Policy
- Centre for Science and Environment 2012, *Proposal for additional excise duty on diesel cars to reduce public revenue losses and public health costs*
- Indian Petroleum and Natural Gas Statistics 2012–13, Government of India, Ministry of Petroleum and Natural Gas, Economic Division, New Delhi
- *The Energy and Resources Institute Policy Brief*, January-March 2013, Issue 7
- *The Energy and Resources Institute Policy Brief*, March 2013
- *Report of the Expert Group to advise on Pricing Methodology of Diesel, Domestic LPG and PDS Kerosene*, Government of India, October 2013
- Petroleum Product Pricing Reforms in India: Are we on the Right Track?, *The Energy and Resources Institute Policy Brief*, March 2013
- Bharat Petroleum, Price Build up of Diesel at Delhi, http://www.bharatpetroleum.in/YourCorner/PetroPrice.aspx?id=5, accessed on October 19, 2013
- Cerebral Business Research, *http://archive.financialexpress.com/news/parikh-panel-against-export-parity-pricing-for-petro-products/1177016,* accessed on October 2, 2013
- CNBC, With diesel loss at historic low, experts see OMCs' upgrade, *http://www.moneycontrol.com/news/economy/with-diesel-loss-at-historic-low-experts-see-omcs-upgrade_1167995.html*, accessed on September 2, 2014
- Economic Times, *Government may alter diesel, LPG pricing to cut subsidy burden, http://articles.economictimes.indiatimes.com/2013-07-07/news/40421444_1_import-parity-price-lpg-subsidy-burden*, accessed on July 7, 2013
- Economic Times, *http://economictimes.indiatimes.com/et-now/corporate/diesel-deregulation-is-a-policy-level-decision-bpcl/videoshow/42890638.cms*, accessed on September 20, 2013
- Economic Times, India's fiscal deficit may rise to 85 pc of GDP in FY14: IMF, *http://articles.economictimes.indiatimes.com/2013-10-09/news/42864377_1_gdp-growth-fiscal-deficit-gradual-fiscal-consolidation*, accessed on October 10, 2013
- Firstpost 2014, Petrol Price cut by 54 paise/litre; decision on diesel after Modi's return from USA*, http://firstbiz.firstpost.com/economy/petrol-price-cut-by-54-paisel-decision-on-diesel-after-modis-return-from-us-102846.html?utm_source=fb_related_stories, accessed on October 1, 2014*
- Hindu Business Line, Siddhartha Kirit Parikh panel for Rs 1–1.50 monthly hike in diesel price, *http://www.thehindubusinessline.com/economy/kirit-parikh-panel-for-rs-1150-monthly-hike-in-diesel-price/article5174835.ece*, accessed on September 28, 2013
- Nidhi Verma, Reuters, India's oldest refineries to face survival test on diesel deregulation*, http://in.reuters.com/article/2014/09/25/india-diesel-idINKCN0HK2K220140925*, accessed on September 27, 2014
- Petroleum Planning and Analysis cell, http://ppac.org.in/content/150_1_Subsidy.aspx, accessed on September 15, 2013
- Press Information Bureau, Ministry of Petroleum and Natural Gas, Government of India, *http://pib.nic.in/newsite/PrintRelease.aspx?relid=102799*, accessed on January 28, 2014
- Press Release, One World South Asia, January 25, 2012, Rapid dieselisation of Indian cars poses health risks*, http://southasia.oneworld.net/news/rapid-diesel-isation-of-indian-cars-poses-health-risks#.Uyla6vmSwso*, accessed on November 11, 2014
- *Report of the Expert Group to advise on Pricing Methodology of Diesel, Domestic LPG and PDS Kerosene*, Government of India, October 2013
- With diesel loss at historic low, experts see OMCs' upgrade *http://www.moneycontrol.com/news/economy/with-diesel-loss-at-historic-low-experts-see-omcs-upgrade_1167995.html*, accessed on September 4, 2014

Centre for Science and Environment
41, Tughlakabad Institutional Area, New Delhi 110 062
Phones: 91-11-29955124, 29955125, 29953394
Fax: 91-11-29955879 E-mail: cse@cseindia.org
Website: www.cseindia.org