The Bharat Stage standards are **environmental norms** that regulate vehicular emissions, controlling the levels of **carbon monoxide**, **nitrogen oxides** and **particulate matter** that can be released when petrol or diesel is burnt. India has been following the **European (Euro) emission norms**, though with a **time lag of five years**. BS-IV norms are currently applicable in 13 cities in which the required grade of fuel is available; the rest of India still conforms to BS-III standards.

India introduced emission norms first in **1991**, and tightened them in 1996, when most vehicle manufacturers had to incorporate technology upgrades like catalytic converters to cut exhaust emissions. Fuel specifications based on environmental considerations were notified first in **April 1996** — to be implemented by **2000**, and incorporated in BIS 2000 standards. Following the landmark Supreme Court order of **April 1999**, the Centre notified Bharat Stage-I (BIS 2000) and Bharat Stage-II norms, broadly equivalent to Euro I and Euro II respectively. BS-II was for the NCR (National Capital Region) and other metros; BS-I for the rest of India.

From **April 2005**, in line with the **Auto Fuel Policy of 2003**, BS-III and BS-II fuel quality norms came into existence for 13 major cities, and for the rest of the country respectively. Subsequently, BS-IV and BS-III fuel quality norms were introduced from **April 2010** in 13 major cities and the rest of India respectively. As per the roadmap in the auto fuel policy, BSV and BS-VI norms were to be implemented from April 1, 2022, and April 1, 2024, respectively. But in **November 2015**, the Ministry of Road Transport issued a draft notification, **advancing the implementation** of BSV norms for new four-wheel vehicle models to April 1, 2019, and for existing models to April 1, 2020. The corresponding dates for BS-VI norms were brought forward to April 1, 2021, and April 1, 2022, respectively. But later the government **recently** announced that India will **leapfrog from the Bharat Stage (BS) IV emission norms** that are now in force, to the **BS VI norms by 2020**. While vehicle manufacturers have been asked to gear up to meet the new deadline, oil companies will also have to prepare to retail BS VI-compliant fuel.

### IMPORTANCE

Upgrading to stricter fuel standards helps tackle **air pollution**. Global automakers are betting big on India as vehicle penetration is still low here, when compared to developed countries. At the same time, cities such as **Delhi** are already being listed among those with the **poorest air quality** in the world.

With other developing countries such as China having already upgraded to the equivalent of Euro V emission norms a while ago, India has been lagging behind. While **BS IV-compliant fuel** in use has **50 ppm (parts per million) sulphur**, BS VI stipulates a **low 10 ppm**. Besides, under BS VI, **particulate matter emission** for diesel cars and nitrogen oxide levels are expected to be substantially lower than in BS IV. The experience of countries such as China and Malaysia (which is currently grappling with haze) shows that poor air quality can be bad for business. Therefore, leapfrogging to BS VI can put India ahead in the race for **investments** too.

### CHALLENGES

The government could face **two key challenges** in implementing the decision. First, there are questions about the **ability of oil marketing companies** to quickly upgrade fuel quality from BS-III and BS-IV standards to BS-VI, which is likely to cost upwards of **Rs 40,000 crore**. Second, and
more challenging, is the task of getting auto firms to make the leap. Automakers have clearly said that going to BS-VI directly would leave them with not enough time to design changes in their vehicles, considering that two critical components — diesel particulate filter and selective catalytic reduction module — would have to be adapted to India’s peculiar conditions, where running speeds are much lower than in Europe or the US.

These challenges are very real — note that the penetration of BS-IV motor spirit (petrol) in the domestic market a full four years after its introduction in the metros, was just about 24 per cent, and that of BS-IV high speed diesel only 16 per cent, according to government data up to August 2014.

Also, the rollout model of introducing higher grade fuel and vehicles first in the cities has fundamental drawbacks, as was evident in the BS-IV implementation. In the periphery of designated BS-IV cities, BS-III vehicles could be registered; BS-IV vehicles (especially heavy vehicles) were more expensive, and BS-III fuel was cheaper than the BS-IV equivalent. And interstate trucks and buses, the biggest polluters, were forced to stay on with BS-III engines simply because the fuel outside cities did not conform to BS-IV norms.

**FUEL QUALITY COSTS**

The government has been unable to move completely to BS-IV because refiners have been unable to produce the superior fuel in the required quantities. BS-IV petrol and diesel essentially contains less sulphur, a major air pollutant. Sulphur also lowers the efficiency of catalytic converters, which control emissions.

Broadly, BS-IV petrol and diesel have 50 parts per million (ppm) of sulphur, as compared to 150 ppm for petrol and 350 ppm for diesel under BS-III standards. Oil companies are learnt to have put in Rs 30,000 crore between 2005 and 2010 to upgrade; the auto industry has made investments of a similar size. Oil firms will have to invest another about Rs 40,000 crore to upgrade fuel quality to BS-VI; additional investments by automakers to upgrade will inevitably raise the prices of vehicles.

**MANUFACTURING INDUSTRY ARGUMENTS**

The auto industry argues that the huge improvements in vehicular technology since 2000 have had little impact in India due to Indian driving, road and ambient conditions. Industry estimates of required investment to upgrade from BS-IV to BS-V are to the tune of Rs 50,000 crore. Vehicles must be fitted with DPF (diesel particulate filter), a cylindrical object mounted vertically inside the engine compartment. In India, where small cars are preferred, fitting DPF in the limited bonnet space would involve major design and re-engineering work. Bonnet length may have to be increased, which would make vehicles longer than 4 metres, and attract more excise duty under existing norms. Also, DPF would have to be optimised for Indian conditions. The technology available in Europe can’t be used in plug-and-play mode, claim auto majors.

BS-VI vehicles also have to be equipped with an SCR (selective catalytic reduction) module to reduce oxides of nitrogen, which is done by injecting an aqueous urea solution (AUS 32, which contains ammonia) into the system when the exhaust is moving. Therefore, if BS-V were to be skipped entirely, then both DPF and SCR would need to be fitted together for testing, which, auto firms say, would make it extremely difficult to detect which of the technologies is at fault in case of errors in the system. Ideally, the technologies must be introduced in series, and then synergised. So, even if oil companies manage to leap, auto firms claim they need 6-7 years to switch to BS-VI.
Also, as diesel vehicles would require significant technology changes, the cost differential between petrol and diesel passenger vehicles would expand further. The narrowing price gap between petrol and diesel, the recent ban on registration of diesel vehicles in the National Capital Region, along with the potential risk of restricting diesel-powered taxis could have significant implications for diesel investments by Original Equipment Manufacturers (OEMs). Availability of BS-VI compliant fuel on nationwide basis by 2020 may be a challenge.

AGAINST
Auto industries have four years to make the necessary changes. If the globalised auto industry is already producing the same clean and safe technology in other markets, there is no reason why the same cannot be done for the Indian market.

Car companies are only interested in securing market for the current polluting BS-IV vehicles that are 10 years behind Europe through the scrappage policy. In India, the future vehicle stock to be added in the coming decade is significantly higher than the current stock. If the date of Euro-VI or BS-VI is pushed back, it will lock in enormous pollution for many more years to come.

Regulatory lethargy is responsible for India's relatively slow adoption of improved fuel emission norms. But that does not absolve the Indian automobile industry of its responsibility towards making their vehicles more green. Remember that over the last few years it has been exporting a good number of vehicles to many of those markets where there are vastly superior safety and emission standards in place. It has no option other than following them while entering those markets.

But when it comes to employing the same standards for the cars it produces for the domestic market - be it safety air bags in low-end cars or more stringent emission norms - the question of how they would jack up the prices of vehicles on the Indian roads start bothering Indian automobile manufacturers. It is a reflection as much of regulatory failure in enforcing better standards as of the industry's lack of enlightened thinking in improving overall standards of the vehicles they produce even if that would mean higher prices or lower margins or sales.

The industry may continue to fight its court battle over the use of diesel, but stalling the introduction of better fuel norms on the ground that it would jack up its costs is specious logic. If its costs go up, then it can pass on that impact to consumers in the form of higher prices. But delaying the introduction of improved emission norms is neither good economics nor good politics. It doesn't even speak well of its corporate social responsibility.

CLIMATE CHANGE AND EMISSION NORMS
Climate change is one of the biggest challenges to sustainable development. It is imperative that policies emphasise on measures that are conducive to mitigating Greenhouse Gas (GHG) emissions. In the recent Paris climate submit, through Nationally Determined Contributions (NDC), India has pledged to reduce 33 – 35 % of its emission intensity of Gross Domestic Product (GDP).

Transport sector is one of the largest contributor to GHG emissions in India and emissions in the sector are still continuing to grow, the sector is struggling to meet the mobility demands of the country required for its economic growth. Besides the challenges to provide access to affordable means of mobility, the sector is also grappling with issues like air pollution, fuel efficiency etc. Proper implementation of BS emission norms will play a big role in curbing carbon emissions from transport sector thus helping us to achieve our NDC.
AIR QUALITY AND EMISSION NORMS

The Centre’s decision to adopt Bharat Stage VI automotive fuels nationwide by April 1, 2020 is a key measure that can, if implemented properly, vastly improve air quality. Rolling out the BS VI standard nationally, skipping BS V, has significant cost implications for fuel producers and the automobile industry, but its positive impact on public health would more than compensate for the investment. Major pollutants such as fine particulate matter, sulphur dioxide, nitrogen oxides and carbon monoxide emitted by millions of vehicles on India’s roads are severely affecting the health of people, particularly children whose lungs are immature and hence more vulnerable. Thousands of premature deaths and rising rates of asthma episodes highlight the urgent need to make a radical and complete shift to modern fuels and vehicle technologies.

Tail-pipe emissions from automobiles determine their impact on air quality. It means that engine technology and fuel quality will both have to improve for India to move from its current emission standards, a mix of BS-III and BS-IV, to BS-VI. The transition, therefore, calls for synergy among stakeholders and needs every-one to deal with both financial and technical constraints. Auto companies need to be prepared to handle upgrades for existing vehicles and oil refiners need investments to come up with superior fuel. If support infrastructure is not in place, the transition to the new emission standard will force much hardship upon citizens.

Improved air quality, especially in big urban centres, depends on several factors in an era of fast motorisation. A bloated population of vehicles using fossil fuels has affected travel speeds, worsening pollution levels. Poor civic governance has left roads unpaved and public spaces filled with debris and construction dust, constantly re-circulating particulate matter in the air. Guidelines to control construction dust continue to be brazenly defied, just like those against the burning of agricultural waste.

Moreover, the monitoring of diesel passenger and commercial vehicles – the biggest contributors to total emissions – for compliance with emissions regulations remains poor. Such a record does not inspire confidence that retrofitting of old vehicles to use higher quality fuels such as BS VI can be achieved smoothly. Equally, the distortions in urban development policy that facilitate the use of personal motorised vehicles rather than expanding good public transport, walking and cycling, are glaring. For all its goodness, even BS-VI is no magic bullet.

It is also worrying that the pollution control debate appears to be narrow-focused on emission norms alone. For meaningful impact, it will have to be accompanied by other measures, such as strict scrappage rules, proper monitoring and control of emissions, as well as enforcement of other regulations, including those covering overloading of commercial vehicles. Even this will address only part of the problem since construction dust, coal-burning power plants, and lack of waste management leading to burning of rubbish contribute significantly to pollution levels. The government has done well to advance the deadline for cleaner fuels by three years but it must show the same diligence in making other policy changes in partnership with State governments to clean up the air.

MODEL QUESTIONS (MAINS)

1. In a move to curb vehicular pollution, the Government has decided to pre-pone the implementation of Bharat Stage (BS)-VI emission standards by a year, to April 2020. What do you understand by BS emission standards? What are the implications for automobile manufacturers, environment and consumers, in leapfrogging to BS-VI from BS-V? Examine. (200 Words)