Fleet Electrification to Tackle Urban Pollution

Syllabus: GS3/ Conservation/Environmental Pollution & Degradation

In Context

- Considering the worsening air quality index (AQI) in many Indian cities, there is a need to push top gear on the pace of transition to e-trucks.

Urban Pollution in India

- **Concerns of Air Quality:**
  - The **air quality index (AQI)** in many Indian cities has entered the **red zone** several days this year.
  - Millions of people have to face **serious health hazards** due to recurring increases in air pollution.
- **Role of transport and construction sector:**
  - As per two seminal studies pertaining to De**lhi, the Urban Emission (2015) and the TERI study (2018)**, a significant contributor to urban smog is **PM2.5 and PM10 pollution**, which is caused by the transport and construction sector.
- **Contribution of freight movement:**
  - About 9 lakh new trucks are added to Indian roads every year to an already running fleet of 70 lakh trucks.
  - India carries over 2 trillion tonne kilometres of freight on trucks, annually.
  - These trucks consume **over one-fourth of Indian oil imports** and contribute to **over 90% of road transport CO2 emissions**.

Challenges

- **Potential rise in freight movement:**
  - The rate of increase of the truck fleet is expected to keep increasing in a growing network of roads in an emerging economy.
  - If all these new trucks are powered by diesel-fired internal combustion engines vehicles, as is the case today, our cities will face a greater onslaught of PM2.5 pollution.
- **Low rate of electrification:**
  - India has already electrified rail freight transportation, but that caters to only **about 20% of the freight carried** in the country.
  - On roads, India's electric vehicle penetration rate has crossed the 6% mark, but **electric trucks remain a challenge** due to **upfront costs** and **charging infrastructure** constraints.
- **Cost of e truck:**
  - The upfront cost of a **mid-range electric truck** in India is around ₹1.5 crore compared to about ₹40 lakh for a diesel truck.
  - This and the cost of charging logistics remain major hurdles in the transition to e-trucks in the country.

Suggestions

- **e-trucks:**
  - In India, transport sector decarbonisation pathways have to be led by truck electrification.
  - The recent demand for **7,750 e-trucks in India by 2030**, if it materialises, will result in the country saving over 800 billion litres of diesel till 2050.
- **Attracting private capital:**
  - Public funding alone cannot meet the transformational scale required.
  - A pipeline of bankable projects, effectively structured, which can attract private and institutional capital at a ratio of at least six rupees for every rupee of public money is the need of the hour.
- **Capacity building:**
  - Electricity **demand in the country has increased rapidly** and is expected to rise further in the years to come.
  - In order to meet the increasing demand for electricity in the country, **massive addition to the installed generating capacity** is required.
- **Green freight corridors:**
  - Declaring some of the **expressways and national highways** as green freight corridors will have a demonstration effect in the country.
  - Accelerating feasibility studies, demand aggregation, supplier readiness, and a prudent risk allocation strategy are required to create green freight corridors in India.
  - Such corridors **can first evolve in small stretches** of 500 kilometres on routes with heavy truck movement.
- **Creating facilitative infrastructure:**
  - Innovative financial instruments, incentivisation of charging infrastructure, facilitation of entrepreneurial efforts, and a conducive regulatory environment in the country can bring forth the much-needed breakthrough for truck electrification in India.

Advantages of Electric Vehicles	**Challenges of Electric Vehicles**
• **Lower operating costs:** Electric vehicles have lower fuel costs and require less maintenance than traditional gasoline-powered vehicles. • **Environmental benefits:** EVs produce zero emissions and can significantly reduce air pollution	• **High initial cost:** The upfront cost of EVs is still higher than traditional gasoline-powered vehicles, making it difficult for many consumers to afford them. • **Limited charging infrastructure:** The lack of charging infrastructure makes it

and greenhouse gas emissions. • **Energy independence:** As more renewable energy sources are used to power EVs, it can reduce dependence on fossil fuels. • **Improved performance:** EVs have instant torque, which means they can accelerate quickly, and have a smoother and quieter ride. • **Government incentives:** Many countries and local governments offer tax credits, rebates, and other incentives to encourage the purchase of EVs. • **Cost reduction:** The cost of EVs is constantly reducing as the technology improves and economies of scale increase. • **Convenience:** Many electric vehicles have the ability to charge at home using a standard electrical outlet, eliminating the need to visit a gas station. • **Energy security:** EV's use domestic electricity to power the car, reducing the need for oil imports.	difficult for EV owners to travel long distances. • **Battery technology:** The current battery technology still has some limitations, such as limited driving range and long charging time. • **Limited domestic manufacturing capabilities:** India currently lacks the domestic manufacturing capabilities for electric vehicle components and batteries, making it dependent on imports. • **Lack of awareness:** There is still a lack of awareness about the benefits of EVs among the general public in India. • **Lack of standardization:** The lack of standardization in charging infrastructure and lack of uniformity in regulations across states and union territories is a challenge. • **Power Grid infrastructure:** India's power grid infrastructure is not fully developed and is not capable of handling the high-power demand of EV charging stations.

Way ahead

- It is commendable that the government is aggressively electrifying the bus fleet, and sets electrification targets for bus aggregators.
- However, we must realise the urgency of the need to take such concerted efforts if we want a fresh breath of life in our cities.
- In this era of urgency, where every breath counts, deploying solutions swiftly is paramount.
    - The focus must extend to diesel trucks and dust mitigation — significant PM sources requiring immediate attention. This is important both from an energy security perspective and sustainability perspective.

Roadmap for Electric Vehicles

- India has set an ambitious goal to become a **leader in the electric vehicle market by 2030** with the government laying out a

comprehensive roadmap to achieve this goal, which includes several initiatives and policies to accelerate the adoption of electric vehicles in the country.

- One of the key initiatives is the **Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme**, which provides subsidies to customers who purchase electric vehicles.
- The government has also set a target to achieve **30% electric vehicle penetration in the country by 2030**.
- In this regard, the government is also taking steps for the development of domestic manufacturing capabilities for electric vehicles and their components.

Daily Mains Question

[Q] Examine the need of transition to e-trucks considering the worsening air quality index in Indian cities. What are the challenges in shouldering this transition?