Tyre Particle Pollution from Electric Vehicles

Prelims – Environment and Ecology, Science and Technology

Mains – *General Studies-III* (Environment and Ecology – Conservation, Environmental Pollution and Degradation; Science and Technology – Developments and their Applications and Effects in Everyday Life)

Why in news?

A recent study published by researchers from TIFR, IIT Bombay, and Columbia University reveals that electric vehicles (EVs) may worsen air pollution through increased tyre wear and plastic particle emissions.

Tyre Particle Pollution

- Tyre particle pollution refers to the release of tiny bits of rubber and plastic from vehicle tyres as they wear down during driving.
- These particles become a part of air pollution.
- Tyres release particles of broadly two sizes:
  - **Smaller Particles** (1-10 micrometres): These are very tiny.
  - **Larger Particles** (more than 100 micrometres): These are bigger.
- The study found that *EVs are heavier, experience more friction and wear on their tyres compared to regular petrol or diesel cars*.
- EVs release substantially larger amounts of particle sizes into the atmosphere.
- These plastic particles can have harmful effects on both human health and the environment.

Impacts of tyre Particle Pollution from Electric Vehicles

- **Increased Tyre Wear** – EVs, being heavier due to their batteries and reinforced frames, put more stress on their tyres, leading to accelerated wear.
- **Microplastic Release** – The increased tyre wear results in the release of tiny plastic and rubber particles (microplastics) into the air.
- **Health and Environmental Risks** – These airborne microplastics can be inhaled, posing respiratory and other health problems. They also contribute to microplastic contamination in ecosystems.
- **Increasing Airborne Pollutants** – The smaller particles, being lighter, remain suspended in the air for longer durations, thereby increasing the concentration of airborne pollutants.
- **Primary Fragmentation** – Heavy EVs experience more sudden tyre wear from rapid acceleration, braking, and road irregularities.
- This process, known as primary fragmentation, primarily produces the smaller, more problematic particles that remain airborne.

Way forward

- **Technological Solutions** – Development of sturdier tyres specifically designed for heavier EVs.
- Research into particle capture systems that prevent tyre fragments from entering atmosphere.
- Innovation in tyre materials to reduce particle generation.
- **Policy Interventions** – Expansion of air quality regulations to include smaller tyre particles.
- Updated emission standards accounting for non-exhaust emissions.
- Stricter manufacturing standards for tyre durability and composition.
- **Infrastructure Improvements** – Better road quality to reduce some types of tyre wear.
- Limited effectiveness on smaller particles that cause air pollution.

Reference

[The Indian Express]