Car Emission Effects on Global Warming

Semanti Deb
University School of Environment Management
Guru Gobind Singh Indraprastha University

With increasing car sales in India, exposure to vehicular exhaust emissions is rising daily. By 2030, annual car sales in India are to be at a high of 10.5 million. 20-30% of particulate matter (PM) 2.5 present in the environment is due to the direct contribution of vehicular emissions. 8% of total Greenhouse Gas Emissions in India are from vehicles, and in Delhi, particularly, it exceeds 30%

The transport and road sectors account for the highest degree of vehicular emissions. The road sector alone is responsible for about 15% of total CO2 emissions. 45% of CO2 is emitted from passenger vehicles. If similar situations prevail, these numbers predict a very high percentage of greenhouse gas emissions by 2050.

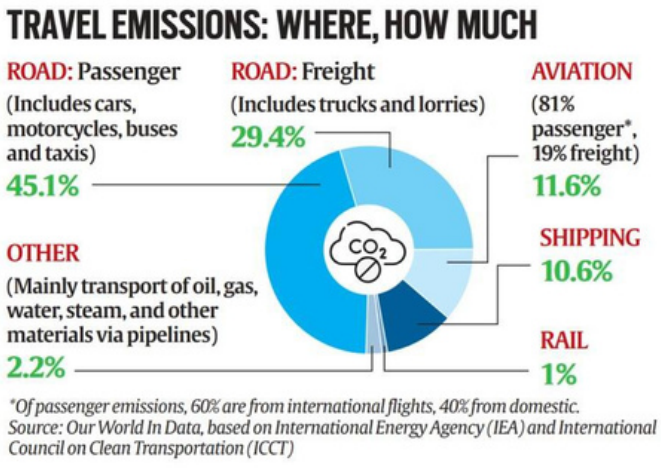

Figure 1 (Source: Express news service, 2021)

What are Car Emissions?

Automobile emissions are a major source of Carbon. Car emissions are chemicals and particulates that are produced by burning fuel in an engine. Major gases present in car exhaust are carbon dioxide, ozone, benzene, nitrogen oxide, and carbon monoxide.

These gases can cause damage to humans if inhaled directly. The world is set on reducing carbon emissions. To combat global warming, reducing car emissions is the key.

Along with CO2, cars produce other pollutants that contribute to global warming, for example, nitrogen oxides (NOx) and particulate matter. NOx can react with other pollutants to form ground-level ozone, which further contributes to global warming. Particulate matter can absorb and reflect sunlight, contributing to changes in climate patterns.

Other factors like the model of the car, the age of the car, and how much it has been driven also affect emissions produced by the car. Older cars generally produce more emissions than newer cars. Older cars are less technologically advanced and are less fuel-efficient. Cars driven at higher speeds produce more emissions than those driven conservatively.

Car emissions are the second largest greenhouse gas emitters in the world. People use cars for traveling and fulfilling their day-to-day needs. The average global temperature is rising, and greenhouse gases contribute hugely to this rise. Greenhouse gases trap the heat in the atmosphere and increase the temperature of the planet. This temperature rise is causing impacts on the environment like heat waves, droughts, heavier rainfalls, hurricanes, etc.

Greenhouse gases are also being actively emitted due to human activities. Majorly gases like carbon dioxide and methane are huge greenhouse gas contributors.

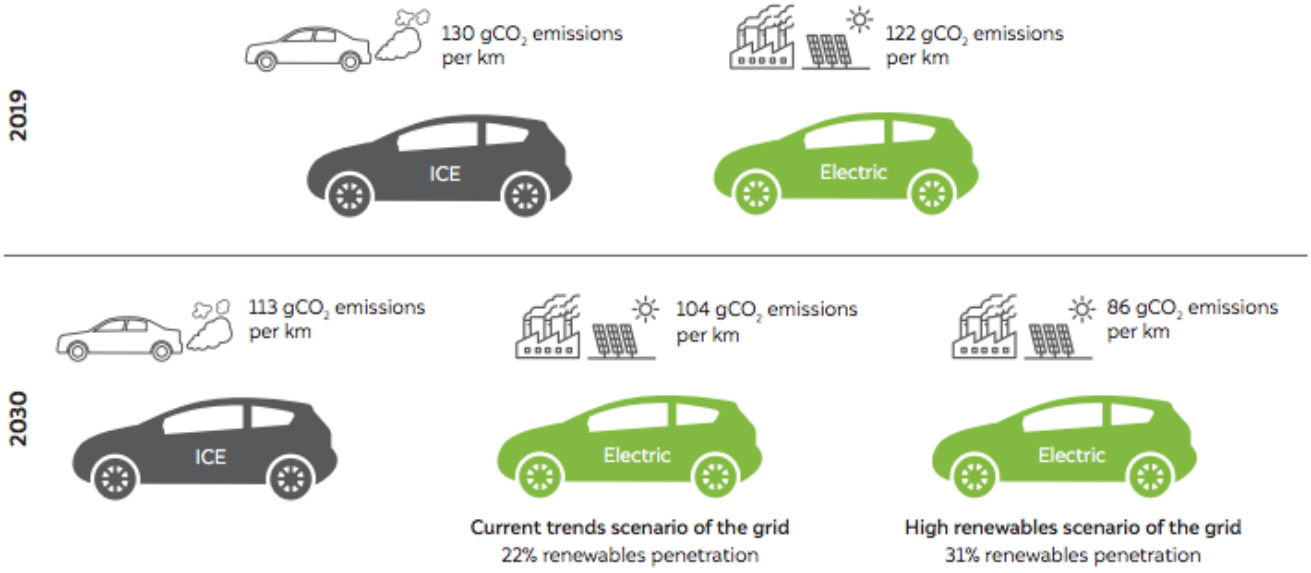

Figure 2 (Source: CEEW, Soman, Ganesan, and Kaur, 2019)

Every 3.7 liter of gas used by cars emits about 24 pounds of greenhouse gases. In the US, greenhouse gas emissions from transportation account for about 27% of total US greenhouse gas emissions. The transportation department is the largest contributor to US GHG emissions.

Climate change caused by car emissions has a range of impacts on the environment:

1. Rising global temperatures: As more greenhouse gases are being released into the atmosphere, the Earth's temperature increases leading to more frequent heat waves, droughts, etc.
2. Changes in weather patterns: Global weather patterns can differ, leading to more frequent storms, hurricanes, and flooding.
3. Rising sea levels: As global temperature rises, icecaps and glaciers are melting leading to rising sea levels. Coastal cities and ecosystems can become highly influenced by this pattern.
4. Biodiversity loss: Climate change caused due to car emissions can also lead to biodiversity loss as ecosystems are disrupted by changing temperatures and weather patterns.

Initiatives to combat car emissions and global warming:

- Electric and hybrid vehicles: Electric cars produce no emissions, and hybrid vehicles produce lower emissions than traditional vehicles. Switching to electric and hybrid vehicles is one of the most effective ways to reduce emissions from cars.
- Fuel efficiency standards: Governments have the power to impose fuel efficiency standards on automakers. Automakers can produce cars that use less fuel and emit fewer pollutants.
- Alternative fuels: Fuels like biodiesel, ethanol, and hydrogen can be used to power cars, reducing their emissions.
- Public transportation: Spreading awareness and encouraging the public to use public transportation, such as buses and trains, to reduce the number of cars on road, and henceforth the emission.
- Carpooling and ride-sharing: These programs reduce the number of cars on road, and hence reduce the emission.

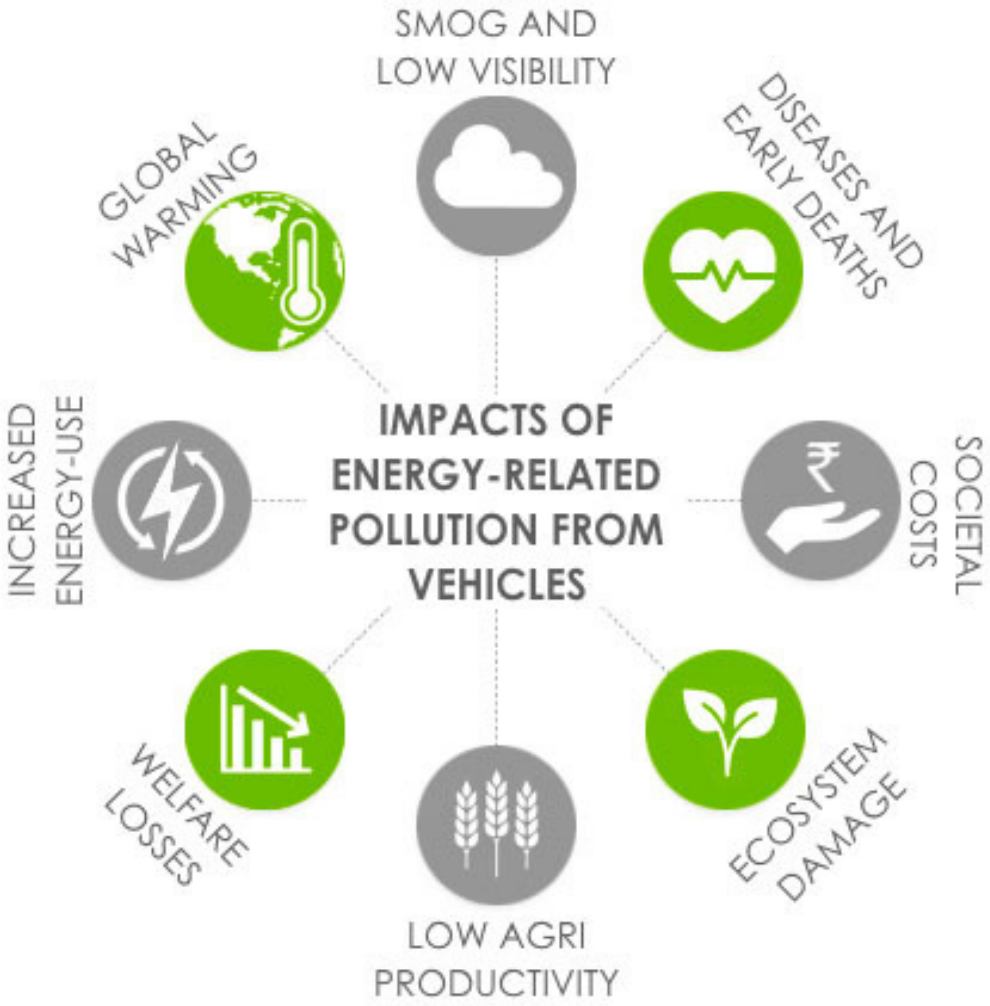

Figure 3 (Source: AEEE, 2021)

- Carbon taxes and cap-and-trade systems: Government can implement carbon taxes or cap-and-trade systems to put a price on carbon emissions and incentivize companies and individuals to reduce their emissions.
- Infrastructure improvements: Improving infrastructure like bike lanes, pedestrian paths, and public transportation can encourage people to use these sustainable modes of transportation and reduce the need for cars.
- Education and awareness: Increasing public awareness about the impacts of car emissions on global warming and promoting sustainable transportation options can encourage people to make environmentally-friendly choices.

References:

1. https://www.ucsusa.org/resources/car-emissions-global-warming
2. https://greenly.earth/en-us/blog/ecology-news/vehicle-emissions-whats-the-impact-on-the-planet
3. https://www.europarl.europa.eu/news/en/headlines/society/20190313STO31218/co2-emissions-from-cars-facts-and-figures-infographics