NOx

NO3 + NO2

Anthropogenic Sources

NO2

Burning of fossil fuels such as coal, oil

Gas →

It forms from emissions from cars, trucks and buses, power plants, and off-road equipment.

NO3

Fertilizer used in agriculture

Storage of manure in ground, causing leaching of nitrates

Effect on Environment

NO2

Can injure trees, forests, and crops →

- stunts growth in plants

NO2 and other NOx interact with water, oxygen and other chemicals in the atmosphere to form acid rain. Acid rain harms sensitive ecosystems such as lakes and forests.

NO3

Excessive amounts of nitrates in freshwater may lead to species of fish being cut off

Eutrophication, where bodies of water obtain high concentrations of nutrients, leading to algae growth

Effect on Humans

NO2

Exposure → Can intensify responses to allergens in allergic asthmatics.

Studies show association with →

Premature death,
cardiopulmonary effects,
decreased lung function growth in children,
Respiratory symptoms, E.R. visits for asthma,
Intensified allergic responses.

NO3

Can be harmful for adults, however it's more potent to infants.

blue-baby syndrome - condition caused by the blood being unable to deliver enough oxygen to the body.

May cause:

Headaches
Dizziness.
Lightheadedness/Nausea

Economic Effects

NO2

More expensive to businesses and factories to switch to wind/solar power in order to prevent the burning of fossil fuels.

Switching to wind/solar power may reduce productivity which would lead to loss of money for that industry/company/business.

NO3

Farmers prefer adding nitrogen, as it financially benefits them

Lowering the amount of fertilizer/NO3 used may negatively impact farmers' income, as the amount of crops produced would be less

Science Behind it

NO2

Some nitrogen dioxide is formed naturally in the atmosphere by lightning and some is produced by plants, soil and water.

However, only about 1% of the total amount of nitrogen dioxide found in our cities' air is formed this way.

NO3

Through lightning: Lightning converts atmospheric nitrogen into ammonia and nitrate (NO3) that enter soil with rainfall.

Industrially: People have learned how to convert nitrogen gas to ammonia (NH3-) and nitrogen-rich fertilisers to supplement the amount of nitrogen fixed naturally.

Primary/Secondary Pollutant

NO2

Secondary →

it is created during the burning of fossil fuels (combustion) which would be a chemical reaction.

NO3

Primary →

it runs off into water source which then leads to negative health and environmental impacts.