

SYNTHETIC GREENHOUSE GASES

Three synthetic greenhouse gases (SGGs) are regulated under the *Ozone*

Protection and Synthetic Greenhouse Gas Management Act 1989:

- hydrofluorocarbons (HFCs)
- perfluorocarbons (PFCs)
- sulfur hexafluoride (SF₆).

The Australian Government is committed to reducing our emissions of the SGGs listed under the Kyoto Protocol. SGG emissions occur mainly as a consequence of leakage or release from various pieces of industrial, commercial and domestic refrigeration and air conditioning equipment, or as a by-product of industrial activity.

The main sources of SGG emissions include:

- HFCs (and sometimes PFCs) are used as refrigerants in industrial, commercial and domestic refrigeration and air conditioning equipment. Emissions occur due to leakage from piping, joints and seals and during the maintenance and decommissioning of equipment
- HFCs are used as foam-blowing agents in the manufacture of polyurethane foams and in applications requiring thermal insulation. The SGG will gradually leak into the atmosphere during the lifetime of the foam

- HFCs are used as propellants in aerosols (mainly in metered dose inhalers such as asthma puffers) and in products requiring a non-flammable propellant for reasons of safety
- HFCs (and to a lesser extent PFCs) are used as fire extinguishing agents in some fixed flooding systems
- the aluminium industry is the main source of Australia's PFCs emissions, which are inadvertently produced as a by-product during the electrolytic smelting process which creates aluminium from its ore, and
- SF₆ is used as an insulating gas by the electricity supply industry to prevent arcing in electrical switchgear. Emissions occur due to leakage and during equipment maintenance and decommissioning.

Synthetic greenhouse gases are used in Australia for a variety of purposes, such as:

- refrigerant gases in air conditioning and refrigeration equipment
- extinguishing agents in some fire extinguishing systems
- foam-blowing agents in the manufacture of polyurethane foams and in applications requiring thermal insulation, such as refrigerators
- propellants in some aerosol products
- insulating gas in the electricity supply industry.

Synthetic greenhouse gases often replace Ozone Depleting Substances.

- Most SGGs have very high global warming potentials (GWPs). The most common SGG used in Australia is HFC-134a, which has a GWP of 1300, meaning that it is 1300 times as potent in the atmosphere as carbon dioxide. Other SGGs are even more powerful global warmers, with PFCs having GWPs between 6500-9200 and SF₆ having a GWP of 23 900. SGGs account for 1-2 per cent of all greenhouse gas emissions in Australia.

Source: <https://www.environment.gov.au/protection/ozone/synthetic-greenhouse-gases>