

Illinois Climate Change Advisory Group

Policy Name: #3 Encourage or require reductions in emissions of high GWP gases
Subgroup: Commercial, Industrial and Agriculture
Policy Type: Financial and/or regulatory
Estimated 2020 Reductions Compared to BAU: 2.7 MMtons CO₂e

Description

Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆) and nitrous oxide (N₂O) are potent greenhouse gases, and some persist in the environment for thousands of years. These gases, referred to as high global warming potential gases (high GWPs), are from 140-23,900 times more potent than CO₂ in terms of their capabilities to trap heat in the atmosphere over a 100-year period. Also, because they remain in the atmosphere almost indefinitely, concentrations of these gases will increase as long as emissions continue.

<http://www.epa.gov/highgwp/index.html>.

This policy proposal assumes the following:

- Mandatory reporting for stationary sources of high GWP gases beginning January 2009.
- Emissions limits for new and existing large stationary sources beginning 2010. Reductions of other GHG gases can count towards the goal unless they are required by another law/regulation.
- Early reductions by affected sources count towards reduction goals.
- Technical assistance provided by the State.
- Affected sources must show reasonable progress by January 1, 2014 and every two years thereafter.
- Adopting state laws, where necessary, to limit commercial releases of high GWP gases, such as releasing coolants from scrapped appliances. Education and enforcement programs.
- Assume a 40% overall reduction in high GWP gases between 2010 and 2020.

USEPA runs voluntary programs with some of these affected stationary sources that have achieved reductions near 40% or higher.

Potentially affected sectors, subsectors or entities

Sector: Industrial processes

Sources of N₂O :

- Nitric Acid Production
- Adipic Acid Production

Sources of HFCs, PFCs, and SF₆:

- Substitution of Ozone Depleting Substances
- HCFC-22 Production
- Electrical Transmission and Distribution
- Semiconductor Manufacture
- Aluminum Production
- Magnesium Production

Substitution of ozone depleting substances (ODSs) with certain HFCs and PFCs is by far the largest source of GHGs among these subsectors, accounting for 32% of all industrial process emissions and 62% of the high GWP industrial process emissions nationally in 2004. They are used as alternatives to several classes of ozone-depleting substances (ODSs) that are being phased out under the terms of the *Montreal Protocol* and the Clean Air Act Amendments of 1990. Ozone depleting substances - chlorofluorocarbons (CFCs), halons, carbon tetrachloride, methyl chloroform, and hydrochlorofluorocarbons (HCFCs) - are used in a variety of industrial applications including refrigeration and air conditioning equipment, solvent cleaning, foam production, sterilization, fire extinguishing, and aerosols. Although HFCs and PFCs are not harmful to the ozone layer, they are potent global warming gases.

USEPA regulates what substitutes are allowed, and they offer voluntary programs and guidance to encourage best practices to minimize releases. This subsector is difficult to address because it includes hundreds of different types of sources. Emissions from some sources can fairly easily be measured (e.g., air conditioning and appliance manufacturers) while for others it will be difficult because there are tens of thousands of release points (e.g., refilling air conditioner coolants). Reductions from this sector would be achieved through education and enforcement of laws to ensure ODS substitutes are handled properly.

Rough estimate of reductions from BAU in 2020

High GWP gases accounted for approximately 52% of all industrial process GHGs nationally on a carbon equivalent basis. (165 out of 320 MMtonsCO₂e in 2004)

<http://epa.gov/climatechange/emissions/downloads06/06Industrial.pdf>

Extrapolating to Illinois:

13.1 MtCO₂e in 2003 from Illinois industrial processes X 0.52 = 6.8 MMtons CO₂e from high GWP gases in 2003 with no change projected for 2020.

6.8 MMtons tons of high GWP gases in 2020 X 0.40 reduction = 2.7 MMtons CO₂e reduction in 2020.

Timetables, duration and stringency

Reporting for stationary sources January 2009.

Stationary source emissions limits January 2010.
Commercial education and enforcement Jan. 2009.

Barriers to implementation

The “ODS substitutes” subsector is partially decentralized and difficult to measure and track.