Hydrofluorocarbons (HFCs) are potent greenhouse gases with global warming potentials (GWPs) that can be a thousand or more times that of carbon dioxide, the baseline for measurement and which has a GWP of 1.

HFCs were introduced in the 1990s as non-ozone-depleting replacements for both chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), which were scheduled for phaseout under the Montreal Protocol. These are not only ozone-depleting but also are significant contributors to global climate change.
Honeywell’s HFC Replacements, Available Today

Honeywell’s portfolio of ultra-low global-warming-potential (GWP) and VOC-exempt solutions, are frequently cost-effective, near “drop in” solutions for today’s HFCs.

Honeywell’s HFC replacements are marketed under the Solstice® brand and include stationary and mobile refrigerants, liquid and gaseous blowing agents, propellants and solvents. These products are based on Honeywell’s new hydrofluoro-olefin technology, which helps customers lower their carbon footprint without sacrificing end-product performance. Like HFCs, these HFO-based products offer excellent performance, efficiency, serviceability and safety – plus a dramatically reduced carbon footprint. They are available now.

HFO-1234yf
A replacement for HFC-134a in mobile air conditioning. HFO-1234yf has a GWP of <1. HFO-1234yf is compatible with current automotive a/c systems. Compared to HFC-134a, it provides comparable cooling efficiency, is easy to implement and is safe to use in vehicles worldwide. Because of its higher cooling efficiency, compared to using CO2 as a refrigerant, HFO-1234yf produces 30 percent less greenhouse gas emissions over the lifetime of an automobile.

Applications include: mobile air conditioning, vending machines and refrigerators.

HFO-1234ze(E)
HFO-1234ze(E) is a low-GWP replacement for HFC-134a, HFC-143b, HFC-152a and HCFC-22 in aerosol, refrigerant and foam applications. HFO-1234ze(E) has a GWP of <1, and is VOC-exempt according to the U.S. EPA and CARB. HFO-1234ze(E) is a UN class 2.2 nonflammable liquefied gas. It is designated as nonflammable by U.S. DOT, GHS, IATA and IMDG standards, and by ASTM E-681, ISO 10156 and EU-A11 methods. It is classified as A2L by ASHRAE in refrigerant applications.

Applications include: extruded polystyrene boardstock and billet, one-component foam, tire inflators, commercial duster and freezer sprays, heat pumps and chillers and various personal care applications.

HFO-1233zd(E)
HFO-1233zd(E) is a replacement for HCFC-141b, HFC-365mfc, HFC-134a, HFC-245fa, HCFC-225, HFC-4310mee, HFC-7100 and HFE-7200, as well as hydrocarbons, for use in foam insulation blowing agent, refrigerant, and solvent applications. HFO-1233zd(E) has a GWP of 1, is nonflammable, and is VOC-exempt according to the U.S. EPA.

Applications include: insulation for refrigerators, freezers, commercial refrigeration equipment, refrigerated containers and LNG ships; spray foam insulation; insulated metal panels; slabstock and molded flexible foam; refrigerant for chillers, and solvents for metal cleaning and electronics, and circuit flush.

A Global Movement

CANADA
Considering HFC phase-down, sector-specific restrictions, or a combination of both for proposal in late 2016

UNITED STATES
• July 2015 EPA prohibited use of certain HFCs used in MAC, commercial refrigeration, foilams and aerosols by certain dates
• March 2016 EPA proposed further HFC bans in chillers, spray foam, and certain MACs for larger vehicles

MEXICO
Credit for voluntary replacements of HFCs in new MAC similar to EPA’s CAFE credits. Phase-out of HFCs in MAC may be effective by 2017 for 2018 models. Bans in other sectors to be considered after EPA final rule

EUROPE
• F-Gas Regulation for certain applications. By 2020, HFCs must have GWP below 2500. By 2022, HFCs must have GWP below 150. General phasedown of HFC consumption between 2015 and 2030
• MAC Directive GWP<150 for automobiles
• Aerosols with GWPs >150 banned in new car aerosols orignal horns since 2008, and will be banned after 2018 in technical aerosols
• Countries with HFC taxes in place: Denmark (2001), Norway (2003), Slovenia (2009), Spain (2014). Countries considering HFC taxes France, Poland and Sweden

SOUTH KOREA
2016 implemented credit for replacement of HFCs in MACs

CHINA
Reporting required for bulk HFC imports into China

UNITED KINGDOM
Voluntary Green Guide (BRE), GWP must be <5

JAPAN

AUSTRALIA
Reviewing options for restricting HFCs. Options to be considered in 2016

For more information:
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