

# update

## Recent Proposed HFC Legislation: What does it mean?



You may have recently read about proposed legislation targeting a reduction in the use of HFCs. You might have even questioned the long term implications of these proposals to your existing equipment. The purpose of this Update is to inform you on these important issues.

### Recent Domestic and International Legislation Activities.

There have been three major legislative proposals regarding HFCs that have occurred in recent months. Two are U.S. focused: Waxman-Markey (HR-2454) Climate Bill, and Boxer-Kerry (S. 1733) Clean Energy Jobs and American Power Act. The other is international in focus: The North American Amendment Proposal to the Montreal Protocol. Though there are some differences, the legislation has the following common attributes:

1. Treat HFCs separately than other Green House Gases (GHG)
2. Phase down, not a phase out of HFCs over an extended time that allows for transition
3. Recognize the societal value of the energy efficiency achieved using HFCs as refrigerants verses the global warming potential of the gas alone

## **I thought HFCs were good for the environment, why are they the focus of regulation?**

The replacement of CFCs and HCFCs with HFCs across all industries has had an overwhelmingly positive impact on our environment. The orderly transition over the last 20 years from ozone depleting (ODP) refrigerants like R-11, R-12, R-22, and R-123 has had a dramatic effect on the hole in the ozone layer of our earth. Growth of this hole has not only stopped, but there is now significant evidence that it has begun to close. In addition, the global warming potential (GWP) of the HFCs that have been used as replacements are several times less than the CFCs they replaced. The shift to HFCs has had an unexpected, but much welcomed, reduction in green house gas (GHG) emissions as a side benefit.

The recent world focus on climate change and unprecedented growth in developing nations has prompted many countries to look for ways to significantly reduce global GHG emissions. HFCs, because they possess a global warming potential, are one of many types of gasses that are included in the proposed regulation. Others include: Carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>) and any other gas designated as a GHG by the EPA.

## **If HFCs are just one of a "basket" of many gasses that are being regulated, then why are they treated separately than the rest of the gases you just listed?**

The answer is because our industry has worked hard to make sure it was that way.

The main mechanism for reduction in these types of agreements are called "cap and trade". The total amount of GHG emissions permitted (based on GWP characteristic weighting) to be produced is capped based upon production in representative year or time period. It is then reduced over time to some target level in the future. Reduction is achieved through quantity reduction (lower volumes of a given gas), lower GWP property (switch to new low GWP gases), or a combination of both strategies. Yearly allocations for production allowances or "credits" are specified by each bill and generally include groups like the electricity, natural gas, home heating oil and propane customers, domestic fuels, etc., including users of HFCs like our industry. As an incentive for early reduc-

tions, those industries that reduce emissions more quickly than the mandated amounts can sell their "excess" credits via auction to those industries which have difficulty in meeting their quotas.

The problem with applying this method generally to all GHGs is that it does not recognize the difference between useful industrial gasses, such as HFCs, and those that are waste emissions (i.e. smokestacks and tailpipe gasses). It is not hard to imagine a scenario where, an industry such as power generation, could find it more cost effective to buy HFC production credits at auction, rather than retrofitting all of its plants with expensive carbon-reduction technology. This would cause a shortage of HFCs for the industries that use them and result in high refrigerant costs for our customers.

## ***"Phase down, not phase out"***

Several consortium groups representing the interests of industries that use HFCs, lobbied legislators to separate out HFCs from the broader "basket of gasses" in their proposals and allow for the reductions phase down to occur independently.

## **Why would regulators allow HFCs to be treated separately?**

There are two very important reasons. First, HFCs in many cases, are used as working fluids in industrial processes or energy-using equipment. Because the gas is used in a closed system, the life time global warming impact of their use is primarily driven by the energy consumption of the equipment (with only the leakage contributing to direct GWP impact). For example, the total carbon-footprint of a chiller over its useful life is much more a function of the equipment real operating efficiency, than of the refrigerant GWP.

Figure 1 shows that the GWP of the refrigerant in a chiller is only a fraction of its total footprint. Figure 2 shows that HFCs have helped to minimize the carbon footprint of chillers over time. This is also why, unlike CFCs and HCFCs, regulators have sought to phase down, NOT phase out, HFCs. They recognize that developing new safe, zero ODP refrigerants can be a compromise of many different attributes, including efficiency and atmospheric life (GWP). And that until new safe, non-ozone depleting, highly efficient, low GWP, alternatives are discovered, HFCs are our best choice.

Second, the past success of the Montreal Protocol in creating an orderly transition away from ozone depleting gasses (ODPs) has proven to regulators that our industries are capable of achieving mean-

ingful reductions using a cap and phase-down process.

**So if HFCs are being phased down and not out, why did Trane communicate that HFCs were going away and that the life of R-123 extended?**

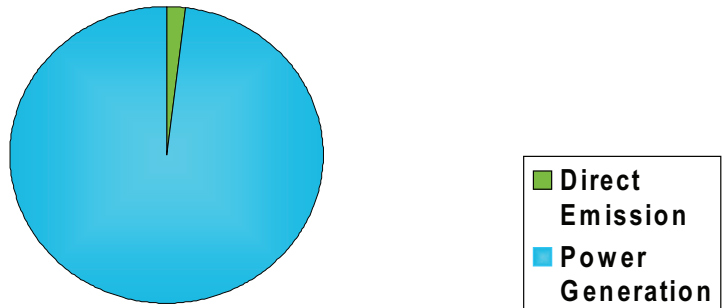
That is classic Trane misinformation. The regulations are requiring a reduction in the CO<sub>2</sub> equivalency from the use HFCs over a period of time. This equivalency can be thought of in simple terms as (GWP x Amount Used). Reductions, therefore, can be achieved in three ways: First to use less of the same HFCs we use today. The second is to use HFCs or alternative that are zero ODP, energy efficient, and have a lower GWP than the ones we use today. The third, and most likely scenario, is to do some of both. Until refrigerants are developed for all applications that are, safe, efficient, zero ODP, and have zero GWP -HFCs are not being eliminated.

R-22 and R-123 are the last of the ozone depleting refrigerants to be phased out. As you are well aware, R-22 goes away domestically (US) in January 1, 2010. That will leave only R-123 left. In 2007, Trane lobbied to have it excluded from the Montreal Protocol and the proposal was overwhelmingly rejected. Even though it has a relatively low GWP, the fact remains that destroys the ozone layer. There is absolutely no support from the parties of the Montreal Protocol or within our own EPA to back-track on the ozone issue when non-ODP refrigerants, like R-134a exist.

**I have heard that the reduction required in these bills is 85% by 2033. Do we feel this is achievable?**

We believe it is. Compliance will be very challenging, but achievable, utilizing known technologies for reducing the refrigerant charge amounts for equipment and, with some applications, converting to low-GWP refrigerant alternatives. (Remember it is: GWP x Usage)

It must be remembered that this reduction amount covers all HFCs used in many industries. This includes applications such as refrigeration, solvents, foam blowing, fire suppression systems, and automotive a/c. Promising new low GWP HFCs have already been identified for use in these industries and the transitions will begin soon.



HVAC Equipment Life-Time Carbon Footprint

Figure 1

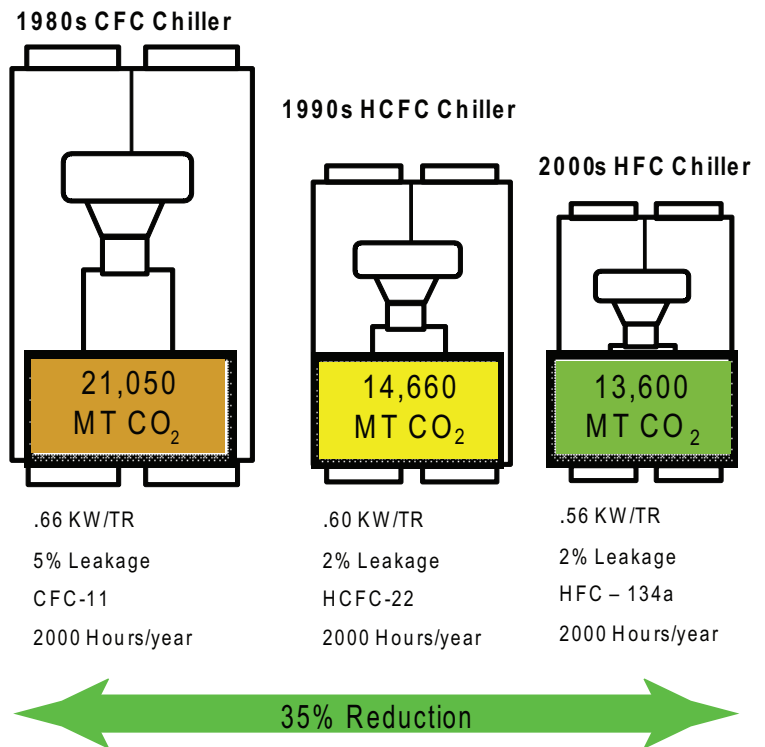


Figure 2

## So what do I need to know?

Should North American Montreal Protocol Amendment be adopted, or a U.S. climate bill enacted, Johnson Controls is confident that we will deliver solutions to meet your needs.

We have utilized a broad refrigerant offering for more than 100 years, including synthetic and natural refrigerants. We have led the industry in the changeover from CFC and HCFC refrigerants to HFC refrigerants by offering the most compre-

hensive and efficient refrigerant solutions. We continue that legacy by investing in the evaluation, research, and development of efficient HVAC solutions with new low-GWP and natural refrigerants.

In addition, we are engaged with industry organizations, academic institutions, and government agencies, advocating on behalf of our customers and ensuring that domestic and international regulation related to environmental stewardship is done in a safe, technically responsible, and affordable manner.