

### The 'super greenhouse gases (GHGs)': fluorinated gases.

By Natasha Hurley

In the UK, fluorinated gases accounted for 2.6% (15.2 MtCO<sub>2</sub>e) of greenhouse gas (GHG) emissions in 2010. Hydrofluorocarbons (HFCs) account for the majority of these emissions (14.3 MtCO<sub>2</sub>e), with the remainder comprised of 0.7 MtCO<sub>2</sub>e of sulphur hexafluoride (SF<sub>6</sub>) and 0.2 MtCO<sub>2</sub>e of perfluorocarbons (PFCs) [1].

HFCs are man-made fluorinated gases (F-gases) developed and commercialised to replace CFCs, HCFCs and other chemicals that deplete the ozone layer. Unlike CFCs and HCFCs, HFCs do not destroy ozone; however, they are powerful GHGs, with global warming potentials (GWPs) hundreds or thousands of times more powerful than carbon dioxide (CO<sub>2</sub>). They are primarily used in refrigeration, air conditioning, foam blowing, aerosols, fire protection and solvents. Climate-friendly alternative refrigerants and technologies are available, and more are being developed, which means that HFCs can be phased out over time.

HFCs represent around 1% of global GHG emissions.[2] Although their contribution to climate forcing is still relatively small, it is expected to soar in the coming decades, with emissions of HFCs increasing at a rate of 10-15% per year.[3] Unless action is taken, global HFC emissions could reach 5.5-8.8 Gt CO<sub>2</sub>e per year in 2050, equivalent to 9-19% of projected global CO<sub>2</sub> emissions under a business-as-usual scenario.[4] This increase could even be as high as 28-45% compared with projected CO<sub>2</sub> emissions in a 450ppm CO<sub>2</sub> stabilisation scenario. A large share of the increase will take place in developing countries, where emissions are projected to be as much as 800% greater than developed countries' emissions by 2050. [5]

The UK's HFC emissions are regulated through European Union legislation known as the "F-gas

Regulation" [6]. In 2011, a study carried out on behalf of the European Commission found significant weaknesses in the current regulatory framework, with widespread lack of implementation combined with inadequate measures actually resulting in a rise in emissions [7]. As a result, the F-gas Regulation is currently being revised. European legislators are considering a combination of an economy-wide phase down of bulk quantities of HFCs, and a selection of bans on their use. EIA's philosophy is that the best way to prevent emissions of F-gases is to stop using them. The current phase-down proposal in the EU would avoid more than 70 Mt CO<sub>2</sub>e per year (equivalent to more than 10% of the UK's annual greenhouse gas emissions) by 2030. A recent report by the Committee on Climate Change urged the government to "consider pushing for a more ambitious agreement, with more rapid phase out of some uses of these gases" and "***increasing the speed of phase out of some uses of these gases such that these emissions are zero or minimal by 2020.***" [8].

The UK retail sector has played a pioneering role in demonstrating that climate-friendly refrigeration is both viable and makes sound business sense. Hundreds of stores across the UK now use HFC-free refrigeration systems, with retailers reporting significant gains in energy efficiency when compared with conventional HFC systems. Waitrose has committed to phase out HFCs in new and existing equipment by 2020, with Sainsbury's, Marks & Spencer and The Co-operative set to follow suit by 2030. [9]

As proven by the groundbreaking efforts of British retailers, a wide range of safe, energy-efficient and cost-effective alternatives to HFCs are already in use, particularly natural refrigerants such as hydrocarbons, CO<sub>2</sub> and ammonia. In some sectors (e.g. domestic refrigeration) these have become the

dominant technology. By leading a transition to climate-friendly cooling, the UK and its European partners can take the lead in pioneering and marketing new and environmentally friendly technologies to the rest of the world. This is an opportunity to revitalise the UK's refrigeration sector, and for it to gain first mover advantage in what will inevitably be a huge global industry.

#### About the author:

Natasha Hurley works as a Campaigner on the Environmental Investigation Agency's Global Environment Campaign. She joined EIA from Carbon Market Watch (formerly CDM Watch), where as EU Policy Advisor she coordinated a campaign to ban industrial gas credits from the EU Emissions Trading System. Prior to this she worked at a political affairs consultancy and for the European Commission in Brussels. Natasha holds a first class degree in European Politics from the University of Leeds and a Master's in EU Policy from the College of Europe in Bruges.



The Environmental Investigation Agency (EIA) is an independent campaigning organization committed to bringing about change that protects the natural world from environmental crime and abuse. As part of our work, we have undertaken groundbreaking investigations into the illegal trade in ozone depleting substances (ODS) and have been closely involved in the

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