



## Ozone Depletion

A layer of ozone in the upper atmosphere filters out ultraviolet radiation from the sun before it reaches the earth's surface, preventing serious harm to humans, animals and plants.

### The issue

Certain man-made chemicals, once used in aerosol dispensers and now mainly used in air conditioning, refrigeration and fire protection systems, have caused thinning of the ozone layer. The main gases responsible are chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and halons.

The Montreal Protocol agreements have led to the phasing out of the most damaging chemicals, including halons and CFCs. Although manufacture has ceased in developed nations, the use of existing stocks is permitted. HCFCs, a less ozone-depleting alternative to CFCs, remain in widespread use in refrigeration equipment.

Alternative refrigerants to CFCs and HCFCs include hydrofluorocarbons (HFCs) and hydrocarbons (HCs) – both are ozone-benign. However, HFCs have a high greenhouse gas potential and contribute to climate change. Although hydrocarbon gases, such as butane and pentane, are volatile organic compounds and flammable, they have been safely introduced in domestic refrigerators and freezers, and are starting to be used in commercial refrigeration. They are now permitted for new equipment under certain conditions in all countries except the United States.

### Unilever's impact

We use refrigeration in three areas: manufacturing, transport and retail eg the freezer cabinets in which our ice cream is displayed for sale.

We have not used ozone-depleting gases in aerosols for many years.

### Action being taken

Life-cycle assessments show that we can reduce our contribution to ozone depletion most by improving the environmental performance of our refrigeration in manufacturing and our ice cream cabinets.

### Manufacturing

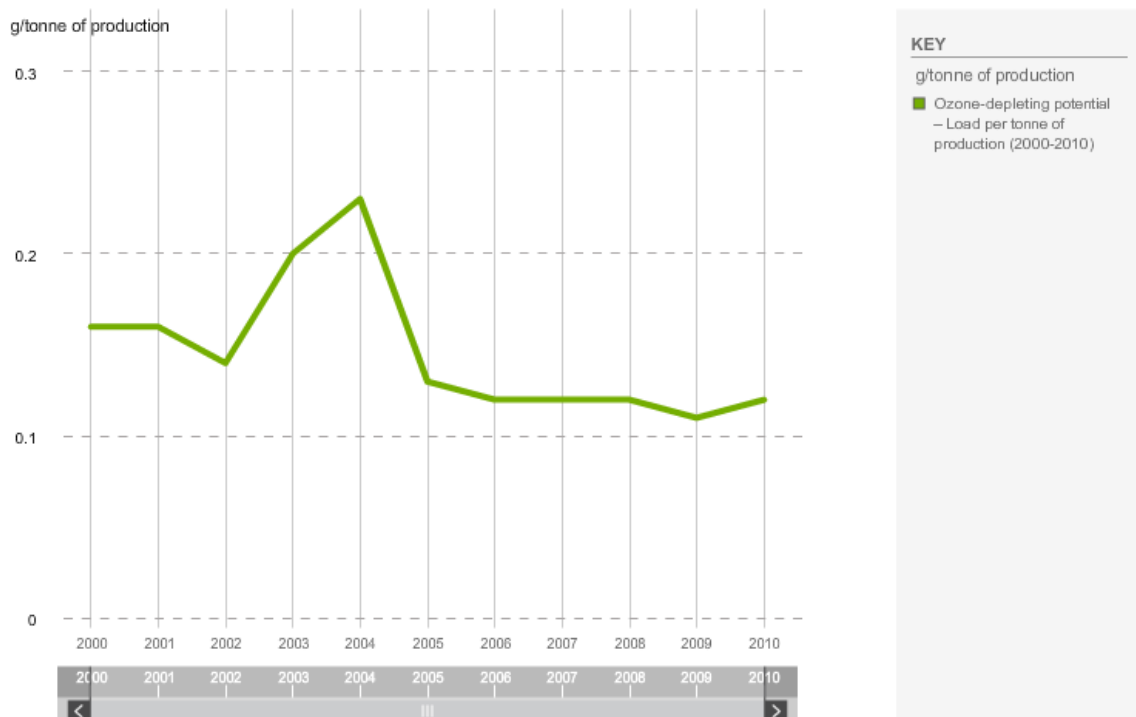
We measure the amount of ozone-depleting gases (CFCs, HCFCs and mixtures) in refrigeration, air conditioning and other applications at our manufacturing sites only (not our ice cream freezer cabinets or uses in transportation), and assess the losses each year. The data shows our ozone-depleting potential (ODP), expressed as kg of CFC R-11 equivalent.

## Ozone-depleting potential

In 2010, total ODP emissions and the amount of ozone-depleting potential expressed per tonne of production increased by 13% and 8% respectively on 2009. However 52 sites reduced their ozone-depleting potential by more than 50%.

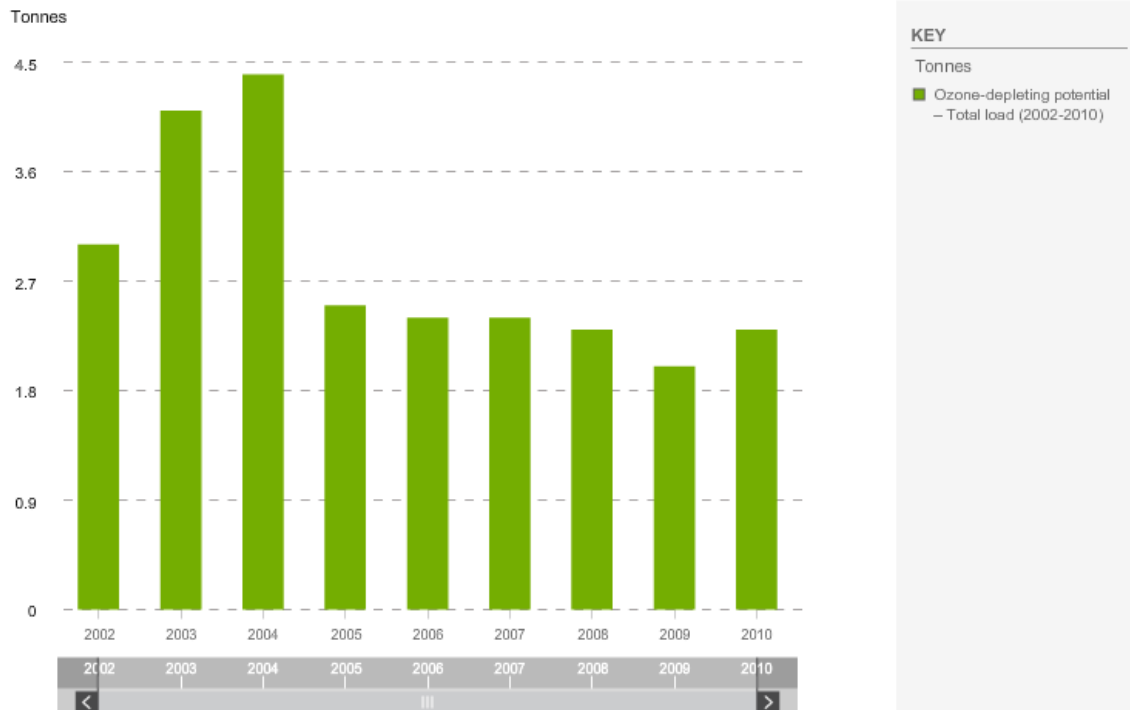


Ozone-depleting potential - Load per tonne of production (2000-2010)



To interact with this chart, please visit the [interactive charts](#) section of our sustainability website.

### Ozone-depleting potential - Total load (2002-2010)



To interact with this chart, please visit the [interactive charts](#) section of our sustainability website.

### Breakdown of ozone-depleting substance emissions (2010)

Refrigerant	Type	ODP of refrigerant (relative to R-11)	Annual consumption (Kg)	Total Unilever ODP (as Kg R-11)
R-11	CFC	1	0.71	0.71
R-12	CFC	0.82	183.51	150.48
R-123	HCFC	0.014	181.44	2.54

R-134a	HFC	0	2704.08	0
R-141	HCFC	0.1	136.5	13.65
R-143a	HFC	0	4	0
R-22	HCFC	0.04	24552.49	982.1
R-401a	CFC / HCFC Containing Mixture	0.03	43.09	1.29
R-402a	CFC / HCFC Containing Mixture	0.02	152.02	3.04
R-402b	CFC / HCFC Containing Mixture	0.03	191.18	5.74
R-404a	CFC / HCFC Free Mixture	0	2105.55	0
R-407a	CFC / HCFC Free Mixture	0	13	0
R-407b	CFC / HCFC Free Mixture	0	10	0
R-407c	CFC / HCFC Free Mixture	0	1556.58	0
R-408a	CFC / HCFC Containing Mixture	0.02	163	3.26

R-409a	CFC / HCFC Containing Mixture	0.04	16	0.64
R-410a	CFC / HCFC Free Mixture	0	357.08	0
R-500	CFC / HCFC Containing Mixture	0.605	1	0.61
R-502	CFC / HCFC Containing Mixture	0.25	50.25	12.56
R-507	CFC / HCFC Free Mixture	0	275.94	0
Others	Methyl Bromide	0.4	2772	1088.8
<b>Others</b>	Misc.zero ODP substances	0	185.14	0
<b>Total</b>			<b>35654.56</b>	<b>2265.42</b>

In 1996, we banned the use of CFCs in new refrigeration systems in factories and committed to minimise their use in existing systems, when and where technology permits. The main ozone-depleting refrigerant used is now HCFC R-22. Although R-22 has less impact on the ozone layer than CFCs, our long-term aim is to use substitutes that have no ozone-depleting potential.

In our ice cream factories and frozen food factory in Italy we use ammonia for industrial refrigeration. This refrigerant does not contribute to either ozone depletion or global warming.

### **Ice cream freezer cabinets**

Our ice cream business has had a policy since 1995 to buy ice cream freezer cabinets that use ozone-friendly refrigerants and blowing gas for the insulation foam. At the time we decided to use HFC refrigerants and hydrocarbon (HC) blowing gas. HFCs do not contribute to ozone depletion but have a high global warming potential (GWP). HCs do not contribute to ozone depletion and have a very low GWP.



The number of cabinets using (H)CFCs continues to decline year on year as they are replaced with new models. We have a clear policy covering their disposal which specifies how (H)CFC gases should be recovered and disposed of.

HFC refrigerated cabinets now represent the highest proportion of cabinets in our fleet. They are being replaced by HC refrigerated cabinets in line with our aim to implement a non-HFC purchasing policy for ice cream cabinets worldwide. To date, we have switched around 430 000 cabinets to HC refrigerants.

See [Climate-friendly refrigeration](#) for more on our work.