Ozone hole repair 'could take decades'

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There are indications that the hole in the ozone layer is being repaired, but the process of recovery will take decades, according to a report published on 8th June 2005 by the Institute of Physics.
The report, which aims to renew action on ozone, looks at the progress made in preventing the loss of "good ozone" that protects us from harmful ultra-violet radiation. It also highlights the fact that levels of "bad ozone" near the ground are rising - which it says will cause significant impact on humans - such as respiratory and cardiovascular disease – as early as 2030.

Published by the Institute of Physics, The Rise of Ozone Research by Dr Peter Hodgson says that despite legislation, it will be decades before the ozone layer is restored to levels that existed before the 1970s. The ozone holes over the polar regions are currently as deep and persistent as ever observed, leading to elevated levels of damaging ultra-violet radiation at the Earth's surface and a rise in the incidence of skin and eye disease.

Dr Hodgson, a specialist working with independent consultants Sci-Fact, warns that the ozone layer is still under threat from many ozone-depleting substances, especially rising levels of CFC replacement compounds, which could undermine the progress made in controlling damaging emissions through legislation.

He warns against complacency and calls for further international efforts to strengthen and extend the Montreal Protocol which sought to restrict the production and use of ozone-depleting chemicals such as chlorofluorocarbons (CFCs). He also says that scientists have a crucial

role to play in driving political change in this area.

Hodgson said: “The Montreal Protocol is doing a pretty good job but I think that an element of complacency has crept in. Although 180 countries have signed up, only a couple of dozen have actually ratified it and the amendments which came along a few years later. The pressure needs to be kept up on the other countries to ratify it and other substances need to be brought under the Montreal umbrella.”

Evidence suggests that while the level of ozone-depleting chlorine is at or near its peak, levels of other ozone-depleting substances, such as bromine, is continuing to rise, the report says. There is uncertainty about the effects of some compounds designed to replace CFCs and for some damaging compounds, such as methyl bromide, there is currently no suitable replacement.

At the same time, global warming, which paradoxically is believed to lead to cooling in the stratosphere in the polar regions, is thought by many to be contributing to cloud formation of a kind which stimulates ozone depletion. The subtle interactions between global warming, ozone depletion and exposure to ultra-violet radiation are poorly understood and need further research, Hodgson says. He also warns that human behavioural patterns, such as people spending more time outdoors in the UK as the climate warms, may be more significant than thinning of the ozone layer in exposing people to harmful UV radiation.

The report explains that the total zone in the stratosphere is still declining, though at a slower rate than previously. It notes: “Despite the progress in limiting the emissions of ozone-destroying pollutants, the timescales of the atmospheric processes involved in ozone destruction mean that it will be decades before it can be judged whether the measures brought about by the Montreal Protocol have been completely successful and that the ozone layer is restored.”

Researchers from Cambridge University reported in April that ozone depletion had not started to improve despite international action. Their comments were based on studies carried out since May last year. Hodgson said he would be cautious about making such a forceful statement, based on one year's observations, given the variability in the stratosphere's weather. But his report does emphasise that "the protective ozone layer remains under threat". It warns: "The ozone 'holes' that appear annually at the polar regions are still large and long-lived; the possibility that climate change may bring conditions likely to cause even greater ozone loss is a contemporary danger."

The report can be downloaded free of charge from policy.iop.org/Policy/HE/index.html

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