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ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

Future Opportunities for Refrigeration Sector in Safeguarding Climate System

by

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We are extremely vibrant moments of the 21st century. I am not only talking about the soaring oil prices and the exploding thirst for energy in emerging developing countries like China and India, but also the fast accelerating concentration of Green House gases in the atmosphere that has no historical parallel in last million years of human existence. The threat to our climate system is now real and the consequences could be devastating. There is near agreement, which is rare in case of international politics, among the leaders of the developed and developing countries that climate change is the most looming threat to civilization today apart from terrorism and viral diseases. A majority of the scientist's around the world have arrived at this consensus through the recent reports of more than 2000 scientists of the Fourth Assessment of Intergovernmental Panel on Climate Change (IPCC) . There are unequivocal findings that human activities are the most likely causes of the global warming. There has been unparallel awareness among the civil society that actions are needed.

At the same time there is unusual inertia and stubbornness on the way and approaches to take expedited actions in wake of such findings. We know that from the time of the industrial revolution human activity has belched out nearly 300 Gigatons of carbon dioxide. That was during the last 100 years. In the next 25 years we will emit another 300 Gigatons. Well before the end of this century, the atmosphere would reach 550 –ppm level twice the pre-industrial level – when it will complete a total emission of 1200 Gigatons of carbon dioxide. We also know that once emitted, the process cannot be reversed. But the expedited actions are pending. The first step is taken in the form of the Kyoto Protocol but it is only the first step.

Actions under the Montreal Protocol

In contrast , the actions taken under the Montreal Protocol have shown successes . Though much work is yet to be done in ensuring the full recovery of the Ozone layer, there are strong indications that we are on the right path. Just prior to the Montreal Protocol, no replacement was considered possible for majority of application for CFCs particularly in the refrigeration and air conditioning sector. Today, the production and consumption of CFCs is down by 96 % from 1 million tons p.a. to only about 50,000 MT annually. The developing countries where most of this consumption lies, are well on the way to make CFCs part of the history books. Considering that few millions tons of these substances were consumed about two decades back, and these substances were part of our daily life , this is quite an achievement. Drastic reduction in consumption of CFCs has certainly helped to reduce atmospheric chlorine loading and set ozone-layer on the path of recovery.

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Montreal Protocol's contribution to reduce global warming.

Actions taken under the Montreal Protocol have also served the objectives of the Kyoto Protocol on climate change . Many of the Ozone Depleting gases are global warming gases. This dual utility of the Montreal Protocol has been quite striking . The implementation of the Montreal Protocol has led to the replacements of CFCs with HCFCs and HFCs among others. CFCs as well as their replacement (HFCs & HCFCs) have Global Warming Potential (GWP) . The GWP of CFCs is higher than that of HFCs and HCFCs. As a result of this replacement of CFCs , in a decade starting from 1990, the combined CO₂ equivalent annual direct emissions of CFCs, HCFCs and HFCs have decreased by nearly 30% to 2.5 Gt that represent 10% of total CO₂ emissions due to fossil fuel burning in year 2000.

Future Opportunities

The current and future emission of CFCs, HCFCs and HFCs will come from their Banks. Banks are substances that have been produced but not yet released to atmosphere as they are stored in equipment, stock-piles, captured in foams etc).

Worst, there are no regulatory obligations to restrict their emissions either under - so far successful - Montreal Protocol or the Kyoto Protocol that just entered into force. How serious are these current and potential emissions?

Current Banks of CFCs, HCFCs, HFCs and HFCs are estimated to be in equivalent CO₂ of 21Gt. This is about the same as annual emission of CO₂ in the year 2000 ! HFC banks have started to build up and will be in equivalent to 5Gt of CO₂ eq in 2015, nearly 20% of total CO₂ emissions in year 2000. The share of Refrigeration, air-conditioning and heat pumps in the banks is ensured 50% and in emissions will be 80%. The situation becomes alarming if we further consider that GHG emissions related to energy use in running the equipment which are a life cycle may be of magnitude larger than direct GHG emissions.

It is clear that, while the global community world-wide is on the right track to safeguard ozone layer, the same cannot be said about climate system .

Are there major opportunities to redeem this situation? There are. And we need concerted efforts, similar to what we displayed in implementing the Montreal Protocol.

Actions needed urgently :

Informal decisions based on Life Cycle Climate Performance (LCCP) are needed for technology options to be deployed. Improved energy efficient technologies could give economic advantage. Recovery, recycling and destruction have associated costs. But environmental benefits could outweigh these costs.

UNEP through its OzonAction Programme will be assisting developing countries through regulation, financial incentives and voluntary agreements to reduce the impact of these emissions from the banks on global warming.

Apart from direct emissions of GHGs (CFCs, HFCs & HCFCs) *energy use in the refrigeration sector* also contributes to *indirect emissions of carbon dioxide* during the production of such energy. As per conservative estimates, 15% of the total electricity generated in the world – a majority of which is derived from combustion of fossil fuels – is used in the refrigeration sector. Energy efficiency improvements in the refrigeration sector, by end users as well as by intermediate users, therefore have significant environmental benefits.

There is a need to promote actions related to emission reduction and alternative technologies that safeguard the ozone layer and at the same time mitigate climate change. Any improvement in energy efficiency in refrigeration and A/C equipment will have an added benefit if low GWP alternative refrigerants are selected.

Improved MAC system, using the next generation technologies that are promoted due to EU regulations provide extraordinary opportunities to reduce the GHG emissions and also improve the fuel efficiency.

Therefore, the refrigeration sector stands to contribute further to both safeguarding the ozone layer and the climate system. Additional benefits, like improving air quality and health, illustrate the potential of the refrigeration sector to contribute to sustainable development by promoting the actions recommended in the IPCC/TEAP Special Report..

Proposal for the adoption in the conference

A *partnership* between developed and developing countries to promote the actions in developing countries and countries with economies in transition for safeguarding the ozone layer and the climate system need to be launched .

Reductions in direct GHG emissions can be achieved through:

- improved containment of refrigerants;
- reduced charge of refrigerants in equipment;
- end-of-life recovery and recycling or destruction of refrigerants; and
- increased use of alternative refrigerants including not-in-kind technology, with a negligible or zero global warming potential.
- energy efficiency improvements in refrigeration and A/C equipment.
- Improved MAC systems that reduces emissions of GHGs and improve fuel efficiency.

The Refrigeration sector is facing a historic opportunity to further contribute to safeguard the Ozone layer and the Climate system. By further improving energy efficiency in RAC systems and appliances, the world stands to gain by reducing global warming, decreasing air pollution and improving health of billions of habitants of this earth.

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