Background

Decision XIX/6 of the Nineteenth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer accelerated the phase-out of production and consumption of hydrochlorofluorocarbons (HCFCs), by way of adjustment. The Decision also encouraged Parties "to promote the selection of alternatives to HCFCs that minimize environmental impacts, in particular impacts on climate, as well as meeting other health, safety and economic considerations. In addition, it also agreed that the Executive Committee shall give priority to cost-effective projects and programmes which focus on substitutes and alternatives that minimize other impacts on the environment, including on the climate, taking into account global-warming potential, energy use and other relevant factors.

The 66th and 67th Meetings of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol have also begun discussions on maximizing the climate benefits from the phase-out of HCFCs in the refrigeration servicing sector. In particular, a decision to encourage Article 5 countries with approved HCFC phase-out management plans (HPMPs) to take into account climate-related impacts during implementation of their HPMPs has been proposed.

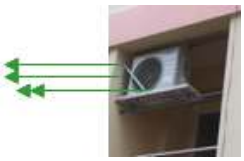
Good practices in the servicing sector could address the following:

- Good practices reduce the emission of HCFCs which are damaging the ozone layer and the climate. Hence, good practices contribute to the healing of the ozone layer and mitigation of climate change;
- Good practices can reduce the demand for HCFCs used for installation of new equipment and for maintenance/servicing of existing equipment. Therefore, good practices can directly contribute to the reduction of HCFC consumption at the national level;
- Good practices maintain the energy efficiency of the refrigeration and air-conditioning equipment at its optimism level, making equipment consume less energy and reducing electricity costs.

Some activities that National Ozone Units may want to strengthen during the HPMP implementation include:

- Giving priority to HPMP activities that promote reduction of emissions of refrigerants, including training of technicians on good servicing practices, containment of emissions, and recovery/reuse of refrigerants;
- Promotion of replacement of HCFC-based equipment to alternatives with lower global warming potential (GWP) and that are energy efficient;
- Minimizing replacement or retrofitting of HCFC-based equipment to alternatives with higher GWP;
- Consultation with regulatory authorities and key stakeholders on ozone, climate and energy issues of the country; and
- Development of policies and standards that promote the introduction and sustainability of non-HCFC and low-GWP alternative chemicals and technologies.

This fact sheet aims to further highlight the benefits to climate and energy efficiency of good practices in the refrigeration servicing sector through some examples of good practices during installation, servicing and maintenance. Therefore, the National Ozone Unit (NOU) could also convey the same to the relevant energy and/or climate protection authorities to seek opportunity for any joint effort.

Bad Practices	Energy consumption and emissions implication	Good Practice	Energy and environment saving
	Installing a condensing unit with restricted air flow leads to poor condensation which results in higher energy consumption.		Make the flow of air without any obstacle for good condensation, so the equipment can operate at its optimum normal energy consumption.
	Installing a condensing unit directly under sun causes poor condensation of the machine, which leads to higher energy consumption.		Some shade or no direct sun rays leads to good condensation which leads to normal consumption of energy which means lesser energy consumption.
	Putting condensers in series leads to poor condensation, high head pressure which makes the system consume more energy.		If the fresh air enter into the condenser good condensation takes place which leads to normal consumption of energy which means lesser energy consumption.
	Venting out any refrigerant into the atmosphere directly contributes to ozone depletion and global warming.		Recover the entire refrigerant into recovery cylinder and reuse the same after recycling or reclamation.
	Using the system compressor for vacuum can leave non condensable gases in the system which leads to: • High refrigerant charge • High head pressure • High current which ultimately causes higher energy consumption.		Charge the machine after ensuring proper vacuum. Always use two stage vacuum pump to remove all non-condensables snd save the life of machine with optimum performance.
	Charge by feel or measuring current can lead to inaccurate refrigerant charge, high head pressure and high current which lead to higher energy consumption.		Charge the refrigerant by weight to save refrigerant, save energy consumption.
	Top up without fixing the leakage contributes directly to ozone depletion and global warming. It also causes the system to consume more energy.		First fix the leak vacuum properly and then charge the system. Ensure that system operates at optimum performance.
	Do not conduct regular clearing of condenser, which makes dust accumulate on the condenser, and leads to higher energy consumption.		Get proper servicing of air-conditioner at regular interval as prescribed by manufacturer. One case study in India showed that at least 10% of the energy saving could be achieved with regular maintenace.

Acknowledgements
This factsheet was reviewed by Prof. (Dr.) R. S Agarwal, Senior Advisor, Ozone Cell, New Delhi, India. Some photographs were provided by Mr. Ashok Kumar Matta, Chandigarh Training Cell, Chandigarh, India.