ISSUE BRIEF

November 2017

An initiative supported by

Council on Energy, Environment & Water

SHAKTI SUSTAINABLE ENERGY FOUNDATION

Standardising Practices in the Air Conditioner Servicing Sector

BY LEKHA SRIDHAR

Introduction

India has been witnessing high growth in the air conditioner (AC) and automobile markets. Hydrofluorocarbons (HFCs) are greenhouse gases that are widely used in AC and refrigeration applications. HFCs replaced hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) in such applications after these ozone-depleting substances (ODS) were phased out under the Montreal Protocol on Substances that Deplete the Ozone Layer. While HFCs have no impact on the ozone layer, they have a significant impact on global warming due to their high global warming potential (GWP). **In October 2016, the Kigali Amendment to the Montreal Protocol emerged, with all countries agreeing to phase down HFCs from all applications.** As per the agreement timeline, India will have to freeze the use of HFCs from 2028 onwards. However, in order to be prepared for the 2028 freeze, and the subsequent HFC phase-down, preparatory activities over the coming years will be necessary to ensure industries

and other stakeholders can transition to HFC-alternatives.

Standards are a formalised set of criteria developed by experts to ensure a certain uniform quality or level of products and services. Compliance to standards can be mandated through legislation or be made voluntary, depending on the type of product or service. Standards can ensure safety considerations, harmonise best practices, support economic growth and minimise technical barriers to trade.[1]

This issue brief highlights the importance of standardising AC servicing practices, as a preparatory activity to prepare the AC servicing sector for the upcoming phase-down, to minimise HFC emissions from the servicing sector, and also to act as a yardstick of minimum expected performance from service technicians. The brief concludes with recommendations to the Government of India for using existing mechanisms to standardise servicing practices.

Why is the servicing sector important for reducing HFC emissions?

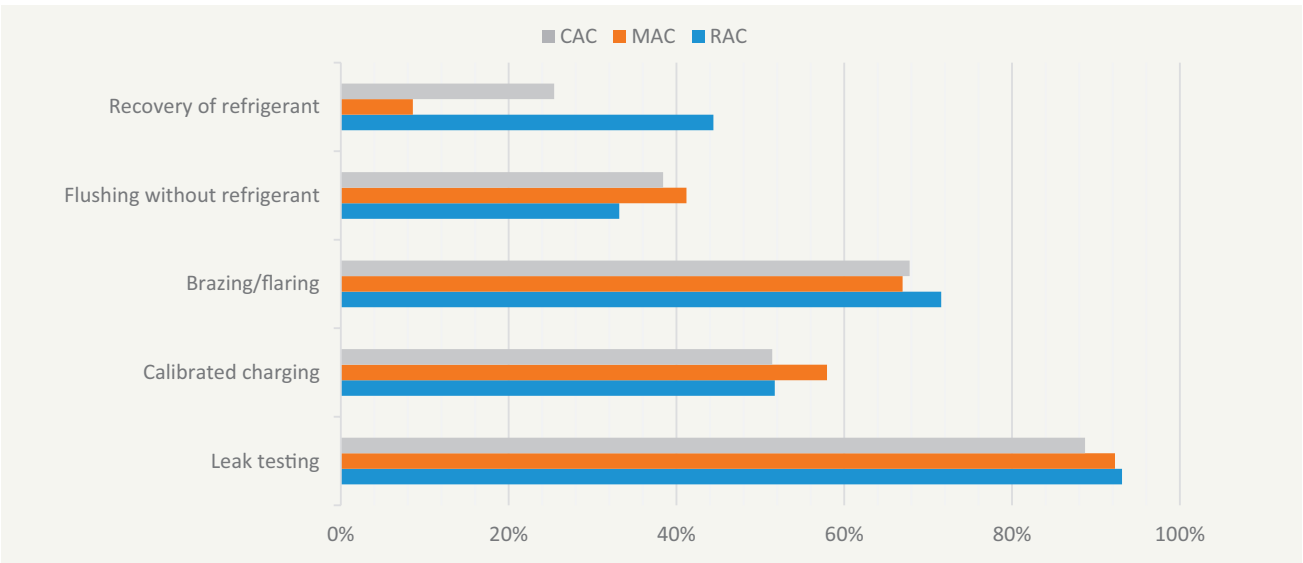
The AC servicing sector in India uses as much as 40 per cent of the total refrigerant consumption, much of which can be reduced by good service practices (GSPs), use of proper tools, and regular servicing of air-conditioning equipment.[2] These "good service practices", as they are often referred to, reduce the environmental impact of servicing (from venting of refrigerants and early detection of leaks) and ensure efficient operation of an AC system. While service practices vary for different types of AC systems, some examples of good service practices include leak testing before refrigerant charging, calibrated charging, flushing without refrigerant, brazing/flaring of parts, and recovery of refrigerant. They also include practices for safe handling of refrigerants as many refrigerants are flammable, toxic or operate at high pressures.

Focusing on the practices of AC technicians who install and repair air conditioners is necessary if countries want to successfully phase down high-GWP refrigerants. The HCFC Phase-out Management Plan of the Ozone Cell recognises the importance of the AC servicing sector as it has included technician-specific policies and funds within the plan.

Role of servicing training and resultant improvements in servicing

A 2017 study by the Council on Energy, Environment and Water (CEEW) found that levels of adherence to good service practices by service technicians in the residential, commercial and mobile air-conditioning sectors (known as RAC, CAC and MAC, respectively) are low, especially for practices like recovery of refrigerant, calibrated charging and flushing without refrigerants.[3]

One of the major findings of the study was the importance of AC servicing training to good service practice adherence. **In the RAC and CAC sector, a technician with servicing training was three times more likely to not follow poor service practices.** However, the study also noted that 10 per cent of



Source: CEEW Analysis (2017)

RAC, and 16 per cent of CAC technicians who had received training were not following good service practices. **The study also noted that there was limited impact of servicing training on good service practices in the MAC sector. While it is difficult to pinpoint the reason for this, it may point to the issue of inconsistent training programmes**—many of which have not been updated with changes in technology—or that such programmes do not cover aspects related to minimisation of refrigerant leakage and venting of refrigerants, both of which are central to reducing the environmental impacts of refrigerants during servicing.

Why are servicing standards necessary?

In the context of AC servicing in India, there are a plethora of training institutions for would-be technicians, that are both privately and publicly managed. Some run in-depth trainings and cover practical aspects, while others are less rigorous. As a result, even a "trained" technician may not be aware of GSPs.

Standardisation of servicing can provide both technicians and training institutes with a set of basic performance criteria to follow during teaching and actual servicing. They can also give training institutes benchmarked curriculum pointers of topics to be covered during servicing training.

While India has no legally mandated standards for most professions, the Ministry of Skill Development and Entrepreneurship (through the respective sector skill councils) has created the "National Occupational Standards" (NOS) for several professions, including residential and mobile air conditioner repair. The NOS describe the standards of performance, knowledge and understanding required when carrying out a particular activity at the workplace. A set of NOS related to a specific job role is called a Qualification Pack (QP). The responsibility of creating and updating these QPs is with the respective sector skill councils.[4]

These QPs are important, in that, they drive both the creation of curriculum, and assessments by the sector skill councils. The Electronic Sector Skill Council (ESSC) has created two QPs for RAC technicians and the Automotive Skill Development Council (ASDC) has one QP for MAC specialists.[5] However, these QPs are neither sufficiently up to date nor detailed enough to provide training institutes guidance on what service practices are critical.

For example, the 'NOS ASC N/1427 performance criteria' states that a technician must "follow standard operating procedures for using workshop tools and equipment especially in the AC system of the vehicle," and must "de-gas and re-gas air conditioning system using recovery unit," among others. However, these criteria are generic and give no indication about minimum technical standards for equipment used, what steps must be followed when de-gasing and re-gasing ACs, and how best to ensure safety and reduced environmental impact. The QPs also do not include any performance criteria on reducing environmental/climate impact of refrigerants due to venting out.

Conclusion and recommendations

Sector skill councils are among the biggest training organisations in the country; the ESSC has over 1500 training centres which train thousands of technicians every year. They also train technicians for manufacturing companies. Therefore, it is imperative that the Standards are not only up to date, but also sufficiently in-depth. **Sector skill councils, especially the ESSC and the ASDC, should, in consultation with experts from the Ministry of Environment, Forest and Climate Change and other line ministries, restructure the NOS to include performance criteria that provide specific guidance to training centres on good service practices, minimum technical requirements of tools and equipment, as well as develop standard operating procedures for different types of ACs to aid HFC phase-down.**

While compliance of the NOS is not mandatory for technicians, updating them still has the benefit of providing the entire industry with expert guidance on what the minimum acceptable standards of performance are.

Endnotes

1 United Nations Environment Programme (2014), "International Standards in Refrigeration and Air-Conditioning", http://www.unep.fr/ozonaction/information/mmcfiles/7679-e-International_Standards_in_RAC.pdf; last visited on 16 Oct 2017.

2 Ozone Cell, Ministry of Environment, Forest and Climate Change, Government of India (2017), "HCFC Phase-Out Management Plan Stage-II".

3 Sridhar, Lekha and Chaturvedi, Vaibhav (2017), "Can the Air-Conditioner Servicing Sector Turn Climate Friendly? Evaluating the Skill Gap", Council on Energy, Environment and Water, New Delhi.

4 For full list of NOS, please see http://www.nsdcindia.org/nos; last visited on 22 Oct 2017.

5 ASC/Q 1416, ELE/Q3101 and ELE/Q3102

This research has been funded by the Shakti Sustainable Energy Foundation.

Cover photo: Wolf Gebhardt / flickr

The Council on Energy, Environment and Water (http://ceew.in/) is one of South Asia's leading not-for-profit policy research institutions. CEEW uses data, integrated analysis, and strategic outreach to explain – and change – the use, reuse, and misuse of resources. It prides itself on the independence of its high-quality research, develops partnerships with public and private institutions, and engages with the wider public. The University of Pennsylvania's 'Global Go To Think Tank Index' has consistently ranked CEEW among the world's top 100 think-tanks in multiple categories. CEEW has also been consistently ranked among the world's top climate think-tanks. Follow us on Twitter @CEEWIndia for latest updates.

Shakti Sustainable Energy Foundation works to strengthen the energy security of the country by aiding the design and implementation of policies that encourage energy efficiency, renewable energy and sustainable transport solutions, with an emphasis on sub sectors with the most energy saving potential. Working together with policy makers, civil society, academia, industry and other partners, we take concerted action to help chart out a sustainable energy future for India.

For queries please email: info@ceew.in