



O2C alternative technologies and challenges for adoption during the KA implementation

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Overview

- O2C technologies: zero-ODP, lower-GWP with higher energy efficient technologies.
- Issues/challenges for market transformation of O2C technologies.
- Way forward for to accelerate adoption of O2C technologies in light of the Kigali Amendment.
- Conclusions



Cooling Sector and O2C Technologies

- Access to cooling is essential to meet many UN Sustainable Development Goals. The cooling sector is expected to be further developed, which might create a feedback loop between demand for cooling, electricity-related CO₂ emissions, and global warming. The development of the cooling sector needs to be guided by Kigali Amendment.
- Lower GWP refrigerants to replace HCFCs and high-GWP HFCs are widely available in higher energy efficient equipment and becoming increasingly accessible.
- In some regions and sectors, it is possible and beneficial for a country to leapfrog from HCFCs directly to lower GWP refrigerants and higher energy efficiency. However, there are some challenges to ensure effective transformation to these technologies.



Issues/challenges for market transformation to O2C technologies

Technologies

- The refrigerant charge size and the potential risk with various technical measures
 - The charge size might affect performance, especially on the energy efficiency
 - New technologies to reduce the charge size such as microchannel heat exchangers, cascade technologies etc.
- Supply of reliable and higher efficiency components, such as compressor, motors and heat exchangers with economies of scale
- Technical know-how and manufacturing capacities
- Patents and Intellectual Property Rights on technology transfer: refrigerant and equipment

Policy/regulations

- Safety regulations, standards, building code;
- Government support for marketing: the public procurement policy, etc;
- Unregulated informal refrigeration and air conditioning servicing sector that blocks it to:
 - Access to policy and technology update
 - Acquire capacity building of technicians
 - Equip with proper tools/equipment
- Minimum Energy Performance Standard (MEPS) without consideration of lower GWP refrigerant

Market

- Market competitiveness of equipment:
 - Additional safety device
 - Economy of scale for O2C products
 - Handling cost in the installation /transportation/storage
 - Constraint on installation requirement – space/occupancy /ventilation device
- Awareness and understanding of the end-users, contractors, architectural designer on O2C technologies, risk, and social benefit;
- Supply chain: Difficulty to assess spare part and key components for after-sale market
- Misleading/exaggerated media news on risk of O2C technologies



Way forward to accelerate adoption of O2C technologies in light of the Kigali Amendment

- National level coordinated/consolidated actions need to be undertaken to guide and support the sustainable development of the cooling sector:
 - Review its linkage to and relationship with the SDG; and
 - Ratify and implement the Kigali Amendment as soon as possible.
- More national authorities beyond National Ozone Unit and the national energy efficiency agency need to be on board to regulate the manufacture, transportation, storage, installation, servicing and disposal process related with the development, adoption and application of O2C technologies, such as:
 - To enact safety regulations, standards, product standards, building code to promote and manage the adoption of O2C technologies i.e. to remove marketing barriers, and to set up procedures, conditions, requirements to minimize potential safety and health risks;
 - To formalize the refrigeration servicing sector: minimum competency requirement for the servicing technicians; servicing workshop registration;
 - To prioritize the trade of refrigeration servicing technicians in its national technical vocational education training system;
 - To favor O2C products through the public procurement policy, product labeling and/or other fiscal measures;
 - To establish banned/controlled list of higher GWP technologies;
 - To support R&D on all pending O2C technical challenges;
 - To raise awareness and training of servicing technicians, contractors, etc.
- Cooling industry including research institutes/universities to continue its R&D to reduce charge size, improve safety related technical measures;
- To finalize the industry standards such as IEC 60335-2-40 sooner; To improve the supply of key components and technology transfer in different regions.



Conclusions

- Lower GWP refrigerants to replace HCFCs and high-GWP HFCs are widely available in higher energy efficient equipment and becoming increasingly accessible.
- The Kigali Amendment will be a driving force for countries to accelerate the transformation to O2C technologies by addressing technological, policy and market challenges.
- Sustained transformation to O2C technologies requires a national holistic approach and cooperation from policy makers in different areas, manufacturer, trader, RAC technicians as well as end users/contractors.
- There is a need to synergize both low GWP and energy efficiency aspects in the transformation to O2C technology as both can supplement the goal of each other.
- UNEP OzonAction will continue to support Article 5 countries before and after transformation process.



Thank you for your attention!

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