

Policy and Technical Challenges for Adoption of Ozone2Climate Technologies in Asia Pacific

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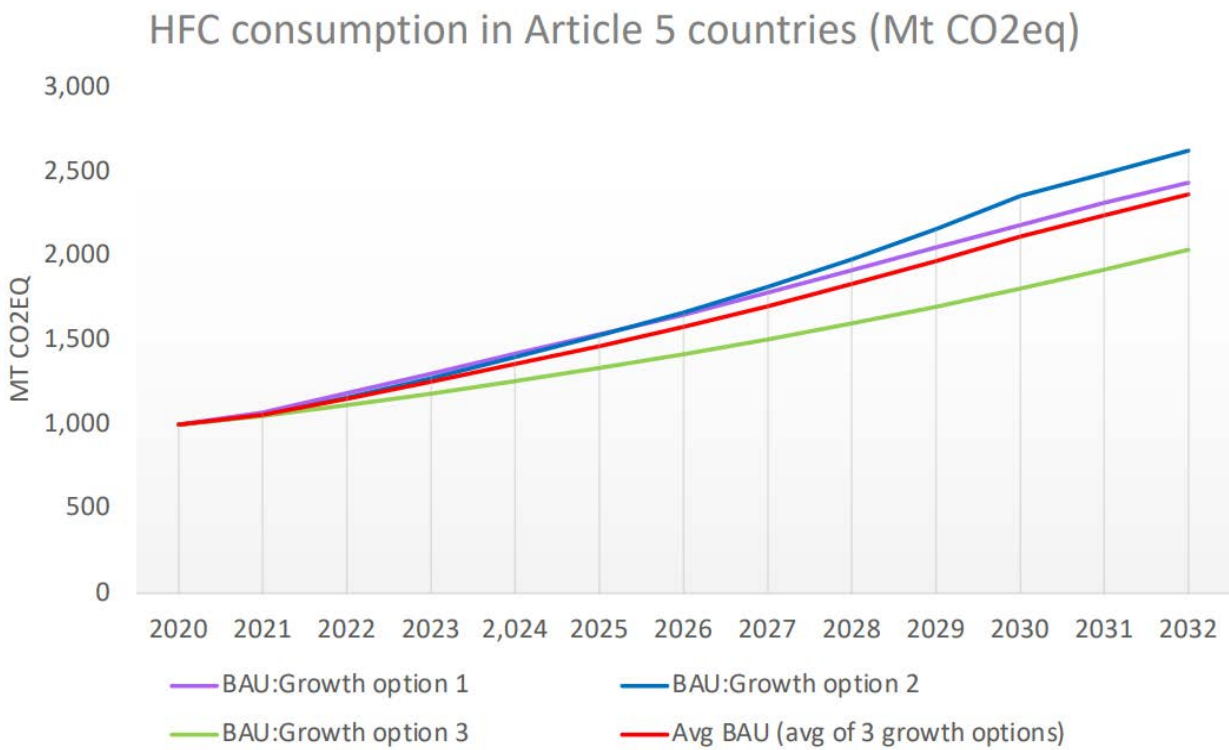
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Growth of HFCs in Developing Countries

- Cooling needs are expected to increase continuously in developing countries especially in the cold chain sector – driving the growth of refrigerant consumption
- HFCs are still being widely used in various sectors with the trend increasing – potential non-compliance for some developing countries soon.
- The phase-down of HFCs under Kigali Amendment as a driving force for adopting O2C technologies has not yet played its role in developing countries.



Source: Climate & Clean Air Coalition (CCAC) Report “Study on HFC Consumption Trends in Article 5 Countries”, June 2022



Factors to Consider

Limit New Demand of HFCs	Reduce Demand of HFCs from Existing RAC/MAC Equipment	Limit Supply of HFCs
Allow accessibility, affordability and safe adoption of low GWP technology in each sector/sub-sector	Improve maintenance and follow Good Servicing Practices	By sector, by substance and by total quota allowances

What are Policy and Technical Challenges?

TEAP's Energy Efficiency Task Force 2022



RACHP equipment using low and medium GWP refrigerants with enhanced energy efficiency is now available but *not necessarily accessible in all countries*



Technology Developments are proceeding rapidly



Early adoption of Kigali Implementation Plans could encourage faster transition to this new generation of RACHP equipment in A5 parties (developing countries)



More Information

TEAP: UNEP Technology and Economic Assessment Panel
<https://ozone.unep.org/science/assessment/teap>





O2C Technologies-Based Products Developed, but Not Yet Widely Used in the Asia and the Pacific Region

R-32 Small-Sized Water Chillers (Heat Pumps)

R-32 Large-Sized Unitary Air Conditioners

CO₂ Heat Pumps/Freezers/Vending Machines

CO₂ MAC (Mobile Air Conditioning)

R-290 Split Air Conditioners

HFO based R/AC Equipment

Ammonia Cold Storage?

Revision of International Standards

There has been significant progress with the development of safety standards to support the transition towards lower GWP alternative refrigerants, that are mostly flammable.



IEC 60335-2-89:2019 - Commercial Refrigeration Equipment: this revised version includes larger charges of flammable refrigerants (*up to 500-1,200 g given certain boundary conditions*)



IEC 60335-2-40:2022 - Electrical Heat Pumps and Air Conditioners: revised to allow HC-290 (propane) and other flammable refrigerants to be used in many AC systems and heat pumps that were previously prohibited by the previous version of the standard.

This new revision allows for the use of a larger charge of flammable refrigerants (up to 988g of HC-290 in a standard split air conditioning system) with additional safety requirements.





Observations for Industry

Need to Increase
Confidence of End-Users on
Low-GWP Technologies:



Industry may be able to reach consensus on flammable refrigerants such as R-290 following the recent adoption of the IEC standard to send a clear message and avoid confusion among end-users: by meeting the new IEC standard for Electrical Heat Pumps and ACs, flammable refrigerant-based ACs can be manufactured, transported, installed, maintained, serviced, and disposed safely.

Low confidence/confusion of end-users has negatively affected the market penetration of flammable equipment to some extent.

Not All International/National
Standards Have Been
Revised:



With the newest IEC standards (60335-2-89:2019, 60335-2-40:2022), all existing international/national standards need to be reviewed and updated, respectively.

How long it will take?

High Price Point of Some
Low-GWP Technologies:



Could HFO prices be reduced? Otherwise, it might be difficult to manage the after-sale servicing market, especially for mobile air-conditioners (MACs).





Observations for Governments



Strategy/Policy to Promote Low-GWP Technology is Not Regulated/Implemented:

- ❑ Need to provide ***clear and strategic policy guidance*** to industry, i.e., prioritized sectors and/or subsectors to be regulated on the use of high-GWP HFCs with specific time frames. Otherwise, it creates challenges for low-GWP alternative to compete in the market with high-GWP HFCs.
 - Governments needs to set a level of competition on a fair basis e.g., not allowing high-GWP HFCs to be used in the sector once the alternative is ready, to ensure a level playing field.
 - Government procurement policies can play a vital role in promoting low-GWP technology.



Need a Holistic and Collaborative Approach

- ❑ There is high potential safety risk when using natural refrigerants and needs stringent control.
- ❑ Need to have a holistic approach and coordinated policy in managing the safety risk of "*natural refrigerants*" which involve many agencies; such as city planning, occupational safety, fire fighting, labor protection, environment, etc.

For example, for Ammonia cold storage, the whole process of venue selection, cold storage design, installation/construction, acceptance, operation inspection, etc. should have a coordinated approach.





Observations for Governments (cont.)



Personnel Not Ready/Competent in Handling Low-GWP Refrigerants:

- ❑ Need for more robust mechanisms in servicing sector to (i) regulate business; (ii) build capacity of personnel and (iii) ensure competency of personnel handling long-term O2C technologies.
- ❑ Consider the licensing system for servicing technicians to secure public safety as a long-term policy target; Developed countries have implemented compulsory permit/licenses for servicing technicians, but from the perspective of reducing use and emission of ODS/HFC, not safety perspective.



Need Mechanisms to Drive End-Users to Use Low-GWP Technologies:

- ❑ Consider introducing "end-user" responsibility to set maximum annual emissions limits for large air-conditioner /refrigeration systems measured in CO₂ eq. End-users of high-GWP HFC systems needs to pay higher maintenance costs compared to lower-GWP O2C based systems, thereby encouraging end-users to invest in the low-GWP system.



Lack of Awareness on Low-GWP Technologies Among Stakeholders:

- ❑ Need to engage new stakeholders to increase their awareness on low GWP O2C technologies and understand the existing institutional set-up to identify a suitable and holistic approach for country.



Thank you



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