Recent Montreal Protocol assessments: reporting on alternatives to ODS (low-GWP HFCs)

BONN, UNFCCC

TEM Meeting on Action on Non-CO_2 Greenhouse Gases

22 October 2014

Lambert Kuijpers

(Technology and Economic Assessment Panel, TEAP)

Low GWP ODS alternatives

Summary of TEAP Task Force reports in 2013 and 2014 (XXIV/7 and XXV/5) on alternatives

- Many low-GWP alternatives are available (and are becoming available), often at low cost; their phase-in depends on the conversion of manufacturing process changes and adapting use patterns (i.e., changes in servicing), with different feasibility and time schedules for foams and for R/AC:
  - -- Hydrocarbons (including methylal, methyl formate etc.)
  - -- Carbon dioxide
  - -- Unsaturated HFCs (HFC(HFO) -1234ze, -1234yf, -1233zd)
  - -- Others (combinations, blends of HFC-HFOs, HFO-hydrocarbons etc.)

Mitigation scenarios

- The Decision XXV/5 (2014) report looked at mitigation scenarios for HFCs; mainly in the R/AC (>90%) and foams (<10%) sectors
- Natural refrigerants are now available for certain applications (CO_2, HCs, ammonia); HFO-1234yf should be commercially available as of 2015-2017; HFC-HFO blends could be available as of 2017-2020
- Mitigation can start before 2020 (e.g. 2017 date for car AC in the EU)
- Two different mitigation scenarios were developed for the XXV/5 report, the most stringent one considers low-GWP blend use in stationary AC as of 2020
- Current HFC demand is in the order of 500 Mt CO_2-eq. in both developed and developing countries; steep growth of HFC use in developing countries
- The stringent scenario shows a reverse of the growing trends in developing countries, implying reductions in the order of **1 Gt CO_2-eq.** by 2030

Conclusions

- Solutions to avoid high-GWP HFCs are available for many current applications; further developments are needed in the near future for a "complete" transition to low-GWP solutions
- Foams are generally blown with low-GWP solutions; in R/AC there are low-GWP "lower" cost solutions for many **smaller** products, "larger" R/AC subsectors still have hurdles for transitions to low-GWP solutions
- Barriers and restrictions for introduction of low-GWP are related to commercial availability issues, product costs, flammability (safety), servicing practices
- Mitigation scenarios developed (by TEAP) show large possible reductions in high-GWP consumption, in particular in developing countries, related to introduction of low- and zero-GWP technologies; the reductions could be as much as **1 Gt CO2-eq.** by the year 2030; first indications for costs exist