Non-CO_2 Greenhouse Gases: High-GWP Gases

Source/Sectors: Substitution of ODS/Motor Vehicle Air Conditioners

Technology: Improved HFC-134a systems (C.1.1.3.2)

Description of the Technology:
This technology improves the construction and dimensions of the flexible hose, connection of the system components, and compressor shaft seals. It is estimated that this reduced leakage accounts for 15g refrigerant emission reduction per year (CARB, 2004). By adopting this option, it is also assumed that MVAC fuel efficiency would improve by 25-30% (CEC, 2005). In addition, indirect emissions can be reduced by improving system efficiency; through the use of oil separators and externally controlled swash-plate compressors (USEPA, 2006b).

Effectiveness: Good

Implementability: Research ongoing

Reliability: Improved HFC-134a systems are expected to become commercially available sooner than other alternatives such as HFC-152a or CO_2.

Maturity: Improved HFC-134a systems are estimated to be available in 2009 or in the near term (CEC, 2005). It is assumed to achieve the greatest market penetration in North America, where industry is not readily moving away from HFC-134a use. Countries with environmental initiatives such as Europe, Australia, and Japan are expected to switch to other options including CO_2 or HFC-152a beyond 2010 (USEPA, 2006b).

Environmental Benefits: HFCs emission reduction

Cost Effectiveness:

Technology	Lifetime (yrs)	MP (%)	RE (%)	TA (%)	Capital cost	Annual cost	Benefits
Improved HFC-134a systems[1]	-	1	18	15	$404.80	$0.00	$168.30

Note: MP: market penetration; RE: reduction efficiency; TA: technical applicability; costs are in year 2000 US$/$MT_{CO2\text{-}Eq.}$
1: CEC (2005)

Industry Acceptance Level: Research ongoing

Limitations: Technology has not been fully developed yet.

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