Non-CO_2 Greenhouse Gases: High-GWP Gases

Source/Sectors: Substitution of ODS/Foam Sector

Technology: Replace HFC-245fa in sprays with hydrocarbons (C.1.4.3)

Description of the Technology:
HCs have lower GWPs compared to HFCs as well as more cost effective, thus making this option viable. HCs include propane, butane, isobutene, n-pentane, isopentane, cyclopentane, and isomers of hexane (IEA, 2003).

Effectiveness: The energy efficiency is lower when foams are blown with HCs than HCFC (approximately 85% of HCFC performance), but can be improved technologically.

Implementability: Some safety uncertainties associated with HCs flammability, performance, and environmental impacts remained. Fire risks can be lowered by employing a large amount of flame-retardants and/or a higher quality fire-retardant (IEA, 2003).

Reliability: Good

Maturity: Good

Environmental Benefits: HFCs emission reduction

Cost Effectiveness:

Technology	Lifetime (yrs)	MP (%)	RE (%)	TA (%)	Capital cost	Annual cost	Benefits
Replace HFC-245fa in sprays with hydrocarbons[1]	25	10	100	0-26	$7.81	-$3.82	$0.00

Note: MP: market penetration; RE: reduction efficiency; TA: technical applicability; costs are in year 2000 US$/$MT_{CO2\text{-}Eq.}$
1: USEPA (2001), IEA (2003), USEPA (2004), & UNEP (2002)

Industry Acceptance Level: It is especially accepted in Europe. However, the penetration is low in the spray foam industry due to the uncertain safety risks (UNEP, 2002).

Limitations: Flammability, performance, and contribution to the ground level ozone and smog are the major concerns of option. HCs require tight safety precautions in manufacturing, storage, handling, transport, and customer use, thus, factory upgrades and sufficient employee training are needed (IEA, 2003).

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