

Intellectual Property, Patents and Phase Down of High GWP HFCS

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Why Intellectual Property

Intellectual property rights are complex for policy makers and civil society

Large number of patents; commercial sensitivity of licensing agreements

Draft paper examines key questions for Indian industry

- What options are available to Indian chemical and appliance manufacturers?
- What has been the experience from past transitions?
- How can Indian Government supported by Montreal Protocol help accelerate transition?

Key Findings

Patents on substitute chemicals have historically not proven to be an obstacle to phasing out CFCs and HCFCs in developing countries

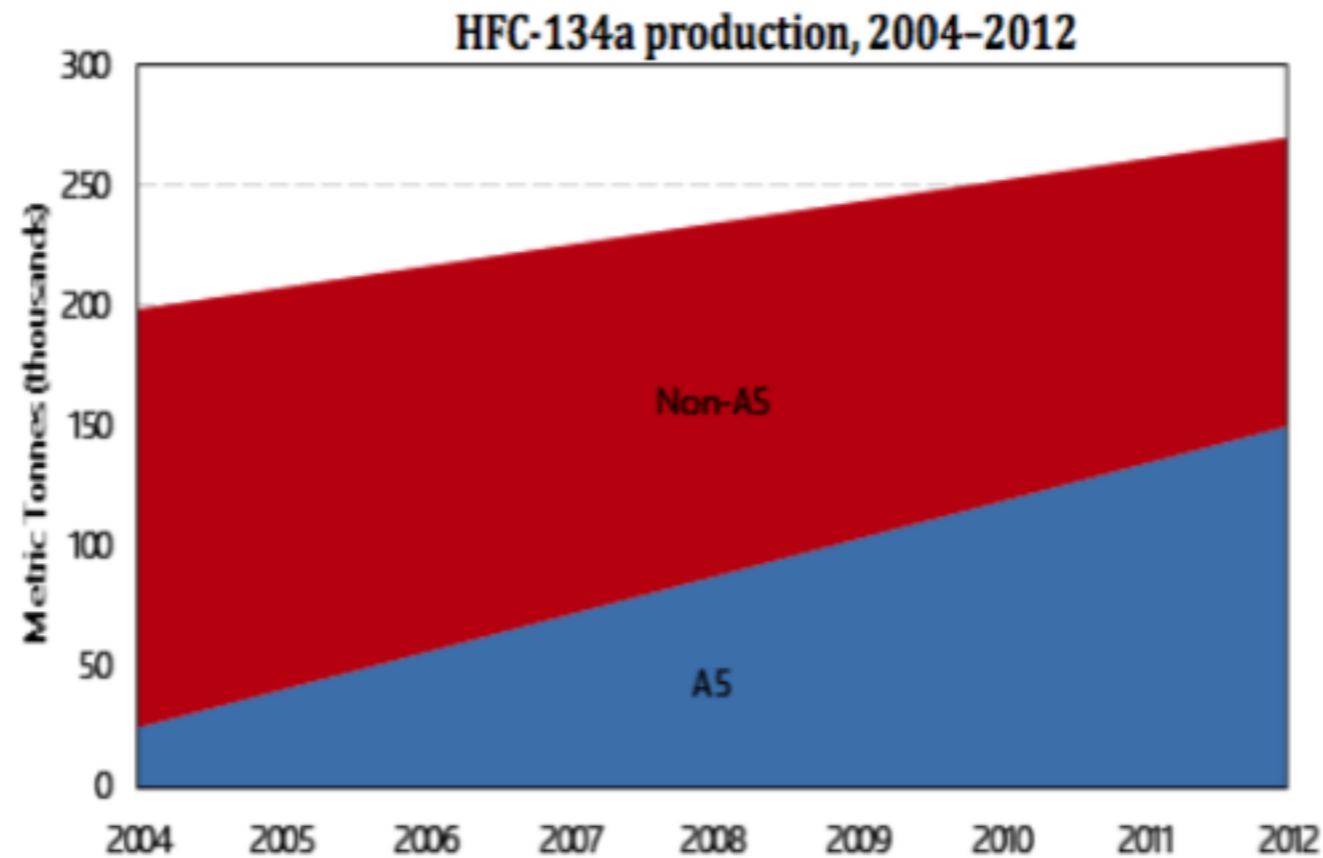
Application patents are becoming a cause for concern for Indian equipment manufacturers

Options exist for Indian refrigerant manufacturing and consumption sector companies to address patents

Where necessary for phaseout, the Montreal Protocol's Multilateral Fund (MLF) has provisions to compensate for the cost of licenses and access to patented technologies

Indian government can support developing a global alliance for a common R&D pool for climate friendly technologies

Experience From Past Transitions



Experience with 134a transition

- In 2004, most production was concentrated in non-Article 5 Parties
- By 2012, more than 50% of HFC-134a production was in Article 5 Parties, post patent expiry in 2005

Application Patents

HFO-1234yf application patent challenged in US and EU courts

- Unclear how Indian courts and government will handle

Very few applications are HFO-1234yf dependent

- MAC is biggest, but is <10% of Indian consumption
- Application patents will expire in mid-2020s; Patent-heavy applications like MAC can wait

Several multinational companies announced plans to build HFO-1234yf plants, approximately 7 million cars on the road

There are legal solutions, financial solutions, technical solutions, and more options available for Indian companies

Options for Indian Companies

- Wait for patents to expire before starting to producing chemicals
- Move ahead with investing in R&D in their own unique process for producing refrigerants - after addressing application patents
- Acquire licenses to refrigerant technology from a company holding patents; or acquisition of companies and technology
- Participate in joint ventures with patent holding companies

Examples of Successful Transition to Low GWP Technologies

- MLF funded demonstration projects for conversion to HC-290 ACs at Midea AC Company, and HC-290 compressor manufacturing at Guangdong Meizhi, China
- GIZ funded upgrade for Godrej Appliances in India and Gree Electric Appliances in China, supporting design, research, development, testing and certification of HC-290 use in Acs
- Based on preliminary findings, technology transfer to developing country companies through joint ventures has already started and will likely accelerate with Montreal Protocol amendment

Patent Ownership of Selected Emerging and Current Refrigerants/Blends in India

Refrigerant	Patent Type	Patents Description	Owner(s) / Applicant (s)	Filing Date
HFC-32	Production Process	Improvement upon production process	Council of Scientific and Industrial Research	1999
HFO (hydrofluoroolefin) -1234yf	Production Process	17 patents published, 4 patents granted	Honeywell International Inc	2008-2015
HC-290			Independent patent holders	2007-2014
HFC-32 - HFO Blend	Blends	Refrigerants containing HFC-32 and HFO-1234yf or 1234ze and other refrigerants	Honeywell International (5 patents); Daikin (1 patent)	2010-2015
HFC-134a - HFO Blends	Blends	Refrigerants containing HFC 134a and HFO 1234yf, HFO 1234zf or other HFCs	Honeywell (3 patents); Chemours (2 patents); Daikin (1 patent); Mexichem Industries (7 patents?)	2011-2015
Patents for refrigerants currently being manufactured by Indian companies				
HCFC-22	Application and Patented Blends	Refrigerant Blends, equipment design for low temperature refrigeration, and equipment design	Independent patent holders (3 patents)	2005-2012
HFC 134A	Application and Patented Blends	Refrigerant Blends, equipment and process patents	Arkema (3 patents); CSIR (2 patents); Daikin (1 patent); Chemours (5 patents); Mexichem (6 patents); etc.	1999 -2015

Source: Information compiled from <http://ipindiaservices.gov.in/publicsearch/>