HPMP and Its Impact on HCFCs in INDIA

by Richie Mittal, ISHRAE
Agenda

Montreal Protocol
HPMP (HCFC Phase Out)
Impact on HVAC&R
ISHRAE’s Role

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The Montreal Protocol

• The Montreal Protocol is a response to the global nature of ozone depletion.

• On September 16, 1987, in Montreal, 24 nations and the European Economic Community (EEC) signed the Montreal Protocol on substances that deplete the ozone layer.

• Most of the nations that are major producers and consumers of CFCs and halon signed the agreement.
The Montreal Protocol

Figure 2-4. The ozone depletion process.
Montreal Protocol

- India became party > 17th September 1992
- CFC Phase-out > 1st Aug 2008 for RAC
- HCFC Phase-out
  - Freeze=2013 at the base-level
  - 10% reduction in 2015
  - 35% reduction in 2020
  - 67.5% reduction in 2025
  - 100% reduction in 2030 allowing for servicing an annual average of 2.5% during the period 2030-2040.
Accelerated phase-out of HCFCs

- In September 2007, the Parties to the Montreal Protocol agreed to accelerate the phase-out of HCFCs, bringing the final phase-out date forward by 10 years for Developed and Developing countries.
Applications impacted

Refrigerants
Foams
Fire
Solvent (cleaning etc)
## Calculation of Base Line

**Base Line eg India**

**ODP T = MT X ODP**

<table>
<thead>
<tr>
<th>Compound</th>
<th>ODP</th>
<th>MT 2009</th>
<th>MT 2010</th>
<th>MT Baseline</th>
<th>ODP T 2009</th>
<th>ODP T 2010</th>
<th>ODP T Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCFC-123</td>
<td>0.020</td>
<td>238</td>
<td>115</td>
<td>176.5</td>
<td>4.76</td>
<td>2.3</td>
<td>3.53</td>
</tr>
<tr>
<td>HCFC-124</td>
<td>0.022</td>
<td>620</td>
<td>603</td>
<td>611.5</td>
<td>13.64</td>
<td>13.27</td>
<td>13.46</td>
</tr>
<tr>
<td>HCFC-141b</td>
<td>0.11</td>
<td>7900</td>
<td>7837</td>
<td>7868.5</td>
<td>869</td>
<td>862.07</td>
<td>865.54</td>
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<tr>
<td>HCFC-142b</td>
<td>0.065</td>
<td>3001</td>
<td>805</td>
<td>1903</td>
<td>195.07</td>
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<td>123.7</td>
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<tr>
<td>HCFC-22</td>
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<td>9387</td>
<td>12503</td>
<td>10945</td>
<td>516.29</td>
<td>687.67</td>
<td>601.98</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>21146</td>
<td>21863</td>
<td>21504.5</td>
<td>1598.76</td>
<td>1617.64</td>
<td>1608.2</td>
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Calculation of Base Line

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ODP T = MT X ODP

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62.3% of Baseline

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HCFC 22 and HCFC 123

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Alternatives

R22
R410A
R32
R290
Others

R123
R134a
HCFO 1233zd
HFO 1336mzz

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ISHRAE’s Role

Refrigerants Technical Committee

Dec 2015 release of Position paper

Nov 2017 release of Guidelines for safe and sustainable use of Refrigerants

Participating in stakeholders workshops

BEE and BIS support

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Refrigerant Trainings 2017

- Full day training programs on Refrigerants
  - Nasik, Kolhapur, Sangli, Ludhiana, Karad, Satara
- Half day or short talks many more
- Webinars on Refrigerant
  - Basics of Refrigerants
  - Impact of Montreal Protocol
- Videos by DL on Member Login
  - Basics of Refrigerants
  - Safety Regulations and Indian Scenario

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Thank You

Upcoming Webinar:

• Alternative Refrigerants and Evaluation Indian Context

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