



Promoting low-GWP
Refrigerants for Air-
Conditioning Sectors in
High-Ambient
Temperature Countries

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#1

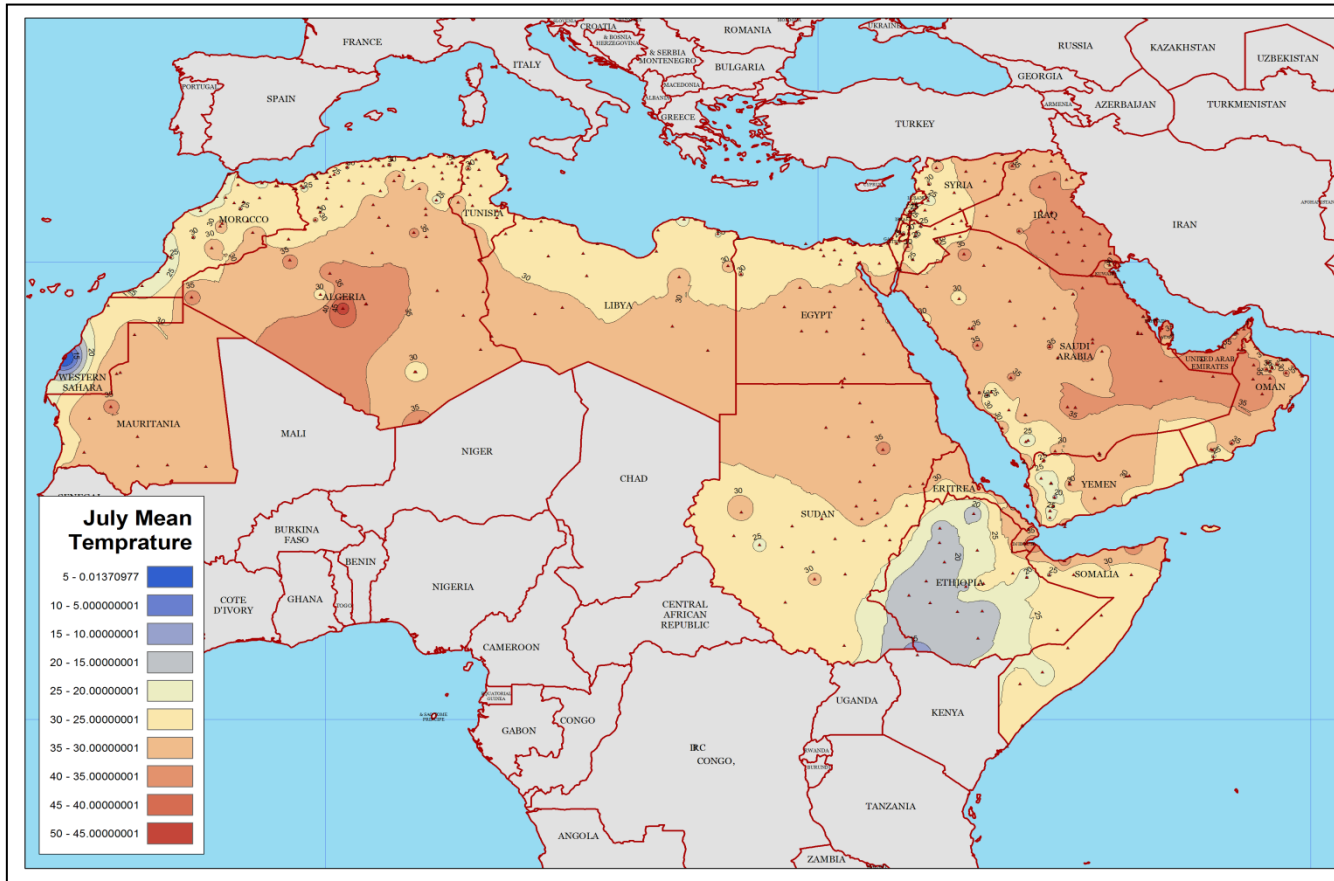
MPB Mandate

- Initially: Phase-out of Ozone Depleting Substances (ODS);

- More recently: Additionally to minimize climate impact:
 - Direct, and
 - Indirect.



- No exact definition;
- In particular countries around the Gulf.





- Air Conditioning is a need – not a luxury;
- Growing awareness on energy usage:
 - Introduction of energy efficiency standards;
- Typical size of A/C units is large
 - Starting at 1.5 TR (18,000 Btu/h);
- Common types: Split - and central A/C and to lesser extent window type;
- For Gulf countries: Majority of technicians are immigrants
 - No stable work force due to rotation.



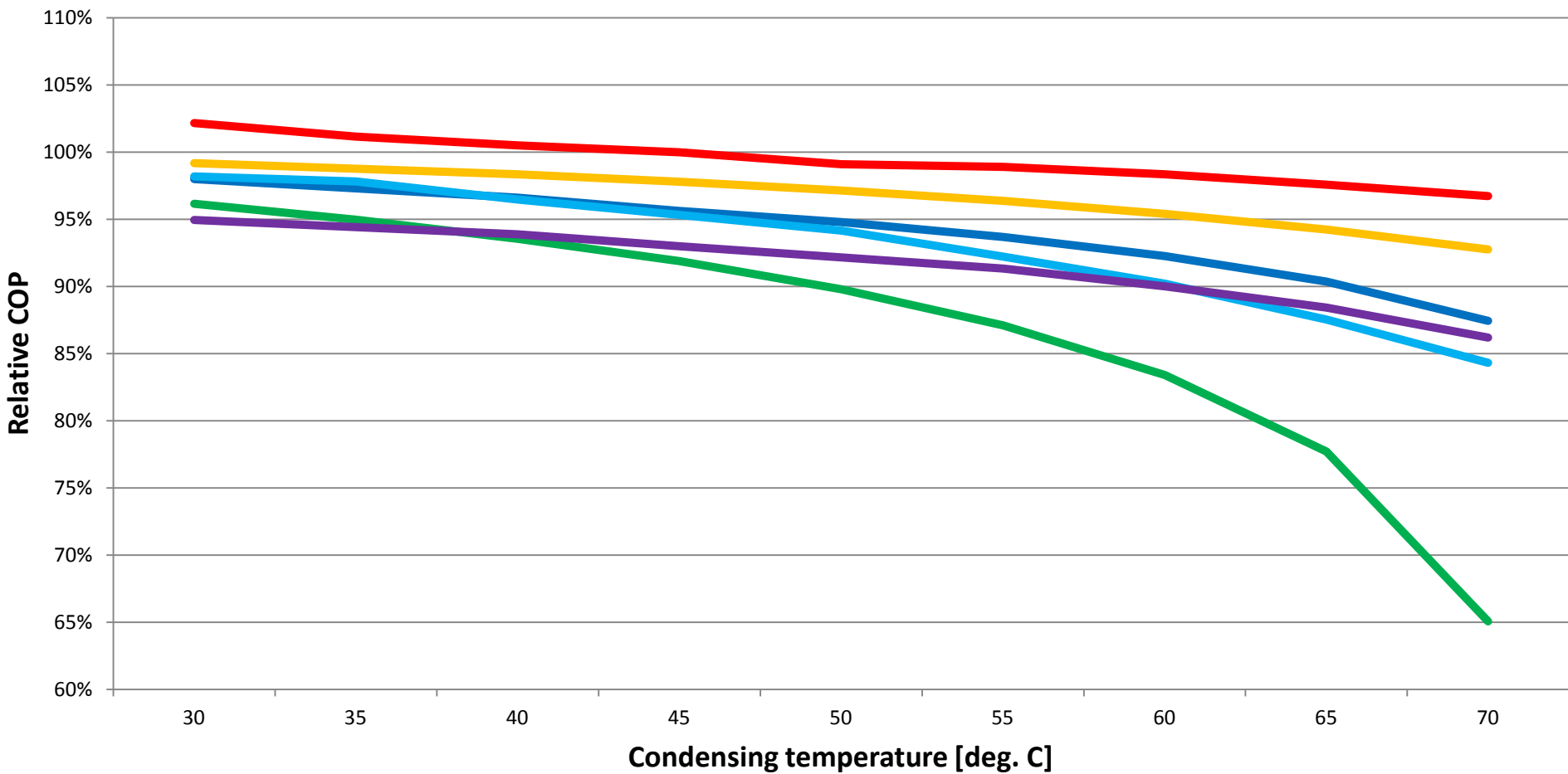
Will alone the change of refrigerant do
the job ???



#5 Alternatives

Relative COP

COP



COP - R-32 COP - R-290 COP - R-410 COP - R-1234yf COP - R-407C COP - R-1234ze



- Have been a hot topic within Montreal Protocol for at least 5 years;
 - No real solution so far;
- Gulf countries account for app. 15% of global market of A/C's;
- Most Gulf countries postpone A/C sector to stage II HPMP;

- October 2012: Dubai Symposium “*Alternative Refrigerants for Air-Conditioning Industry in High-Ambient Temperature Countries; the Way Forward*”;
- Questionnaires for stakeholders (A/C producers and technology providers);
- February 2013: Consultations in Riyadh; and
- April 2013: Approval by ExCom (joint UNEP/UNIDO project)
 - MLF grant: 40%; co-financing: 60%.



- Matrix: Manufacturer vs. technology providers:
 - Respecting preferences from both (if any);
- Manufacture of prototypes (window, split, central) with up to 4 different low-GWP alternatives;
- Independent testing of prototypes:
 - Testing as per AHRI/ASHRAE standards; including high ambient test;
- Assessment study on alternative technologies – including district cooling options (for Qatar);
- Reporting (without details on individual participants); and
- Provide foundation for stage II HPMP's and inputs for EE standards.

- Challenges:
 - Confidentiality;
 - NDA's



#8 High Ambient Project

Participants

CONFIRMED PARTICIPANTS as of May 31, 2013

- 8 manufacturer from West Asia,
 - 5 compressor manufacturer (Int.); and
 - 4 refrigerant manufacturer (Int.).
-
- Overseen by NOU's and UNEP/UNIDO



- Additional challenges:
 - Market acceptability;
 - Requirements for installation/service;
 - Availability of components; and
 - Costs.

- June 10-11, 2013: Start-up meeting in Dubai;
- Duration: app. 12 months.



 **ATMO**
sphere
technology summit
natural solutions
3 - 4 June 2013 in Vienna

Thank you very much for your attention