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Success factors and challenges of R-290 AC

Side event – MOP 28 – October 11, 2016

Kigali / Rwanda

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Outline

- Conversion projects in China;
- Opportunities;
- Barriers and actions taken; and
- Conversion projects in other (UNIDO) countries.

Conversion projects in China – R-290

- GIZ demonstration @ Gree (split);
- UNIDO demonstrations @ Midea (split) and GMCC (compressor);
- HPMP stage I (2011 – 2016):
 - 18 split lines converted;
 - 3 compressor lines converted;
 - Potential annual output: 6 M split A/C's;
 - Substantial research; and
 - Awareness raising.

Conversion projects in China – R-290 (cont'd)

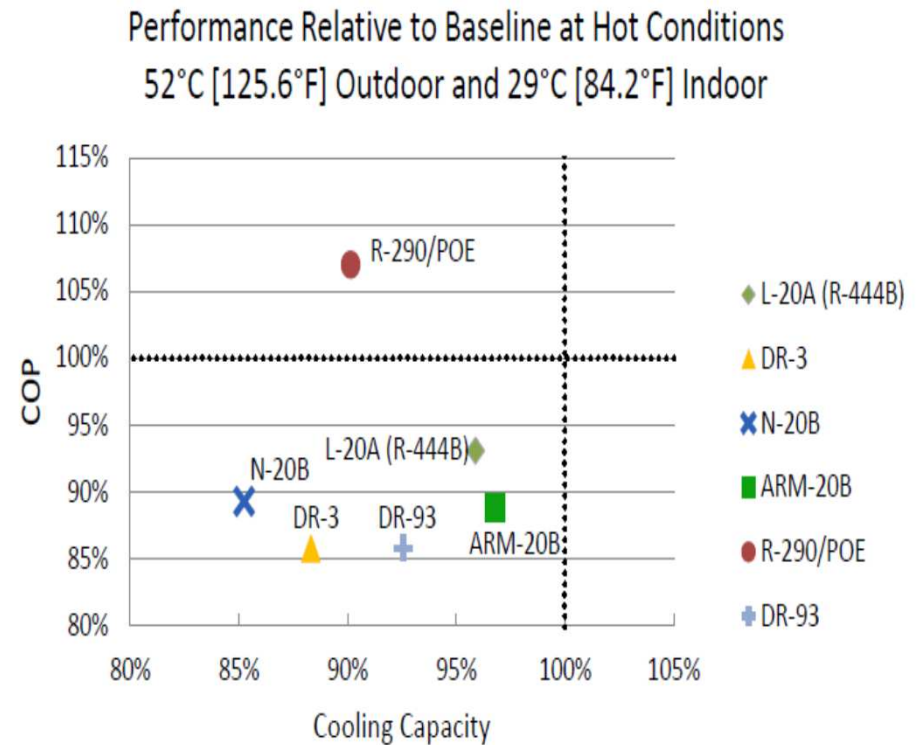
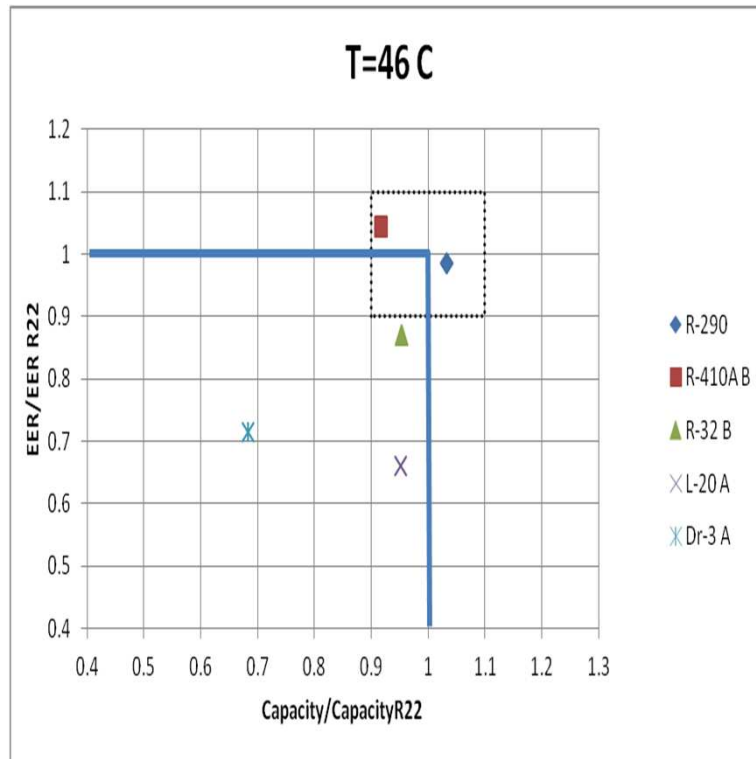
- HPMP stage II (2016 – 2021):
 - 25 assy lines to be converted;
 - May include CO₂ HPWH as well;
 - 4 compressor lines to be converted;
 - May include CO₂ compressor for HPWH as well;
 - Expected approval December 2016.
- Conversion projects are not free of charge – requires a commitment to phase-out equivalent R-22 production capacity.

Opportunities

- Zero ODP and very low GWP;
- Properties close to HCFC-22;
- Probably the technically easiest HCFC-22 replacement.....

- But R-290 is highly flammable!

Opportunities



Barriers and actions taken

- Restrictive standards:
 - Active participation from Chinese industries;
 - Working group on A3 requirements:
- Charge limitations:
 - Research undertaken as part of HPMP; e.g. on charge distribution; maximum leakage; compressor design; HX design; etc.
 - How to handle larger A/C's; i.e. larger than 2 TR?
- Production safety
 - Resolved.

Barriers and actions taken (cont'd)

- Installation and after-sales service:
 - Capacity building and equipment through HPMP;
 - Installation initially through authorized service companies;
 - Informal after-sales is major barrier.
- Financial incentives:
 - Potentially cheaper A/C units – but only when mass production starts;
 - Initial period is supported through IOC.

Barriers and actions taken (cont'd)

- Technical support:
 - Fluoro Carbon industry has been very good in providing tech support;
 - Such mechanism doesn't exist for R-290;
 - Technical expertise at manufacturer level.

Conversion projects in other countries

- Algeria (split and window):
 - Conversion to two refrigerants depending on application/size (likely R-290 and R-32);
- Bahrain:
 - Conversion into two refrigerants depending on application/size (likely R-290 and R-32);
- Brazil:
 - Likely conversion into R-290 (3 factories).

Conversion projects in other countries (cont'd)

- Pakistan:
 - Conversion into R-290.
- Egypt:
 - Conversion of 5 manufacturer into low-GWP – hereunder also R-290 (submission in 2017).

Opportunities

- Recent approved demonstration project in KSA as well as so-called PRAHA-II will facilitate development of window A/C with R-290!



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Thank you for the attention!