



euramm^on

refrigerants delivered by mother nature

Energy Efficiency

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- *The starting point*
- *The issue at stake*
- *Efforts Vienna Energy Efficiency workshop (9-10 July)*
- *Conclusions*

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The starting point

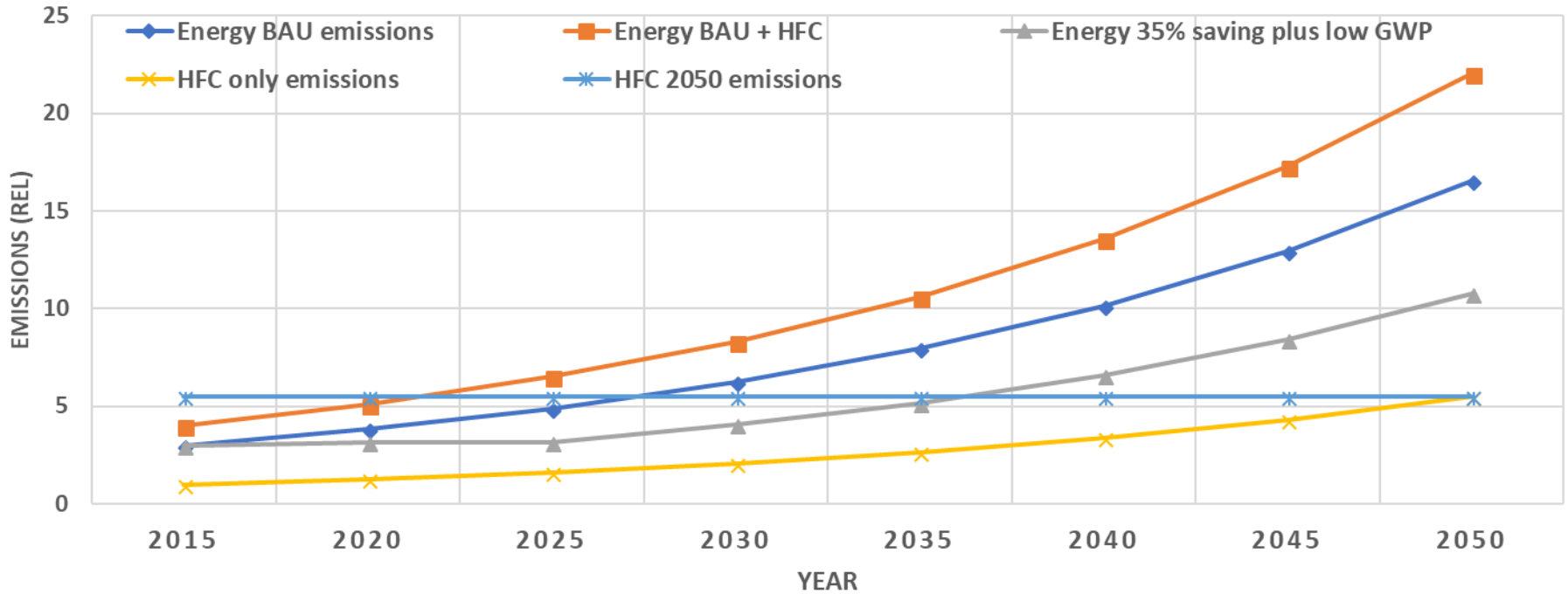
- Thirty eight countries have now signed the Kigali Amendment on HFCs (so, ratification will enter into force by 1/1/2019)
- In how far can Kigali contribute to lower warming (in relation to the well-known 2 C "Paris" target) ? 0.3-0.5 C was mentioned in 2013-14 for a BAU "unlimited" HFC demand growth until the year 2100, in how far was this a comparison on an "equal" basis to the "Paris" 2 C ?
- The stringent reductions of (high GWP HFC) CO₂-eq. consumption when applying the Kigali schedules -- by using "low GWP" refrigerants-- would keep warming below ~0.06 C in 2100
- With 25% of warming coming from direct (high GWP HFC) emissions, it is evident that about 75% is related to indirect CO₂ emissions (if electricity is mainly fossil fuel based)

The issue at stake

- Strictly spoken, on the climate issue, Kigali can do a lot compared to an unlimited BAU, but..
- The difficult issue is to relate the reduction via the direct effect of replacement refrigerants to the (overall) indirect CO₂ effects; in fact, this can only be done ***separately***
- *250% or even much more* growth in developing countries over the next 30 years (until 2050) -at whatever energy efficiency (i.e., at certain indirect emissions)- emphasizes, in fact, that the Kigali “low GWP conversion” will not be the most important climate factor in the whole picture

A graph

EMISSIONS FOR VARIOUS ELEMENTS - 5% GROWTH/YR



Some comments to the graph

- All curves are relative (could be in Mt CO₂-eq. units)
- The yellow (lowest) curve denotes BAU high GWP HFC emissions, the highest curve is an addition of both high GWP and indirect CO₂ emissions for the BAU case
- In 2027 the indirect emissions have already become as high as the BAU high GWP HFC emissions in 2050 (which are to be avoided by conversions to low GWP under Kigali)
- Decreasing the indirect emissions by one third, i.e., by 35% better energy efficiency, still results in CO₂ emissions by the year 2050 that are double the BAU high GWP HFC emissions in 2050 (which are to be avoided by conversions under Kigali)
- This is all under the assumption of a BAU growth for the number of pieces of equipment
- Further decreases can only be realized by decreasing the power factor or reducing the load

VIENNA efficiency workshop and briefing notes

- What is important, is it increasing the “thermodynamic efficiency”, the “equipment cooling efficiency”, the latter often being mixed up with “reducing the cooling load”, better servicing ?
- The impact of a combination of all aspects is difficult to estimate, there are different players involved. THE issue is: achieve a significant reduction of all climate relevant emissions
- Many initiatives were set up (SEAD, K-CEP, under SE4ALL - Cooling For ALL), focusing on the “super-efficient”, affordable cooling (for developing countries); what can they do ?
- Labeling, MEPS, financial initiatives, programs, subsidies, buyer programs, all are relevant
- However, a very important issue: what is happening in the marketplace, which business opportunities are already used in order to increase equipment energy efficiency ?
- Can a Vienna Montreal Protocol workshop on energy efficiency bring things forward ?

Conclusions

- Implementing conversions to lower and low GWP refrigerants makes sense, this ASAP
- Apart from avoidance via using low GWP substances, it is the “huge” energy efficiency increase of equipment, already happening (when increases of 30-40% are feasible), that counts ? – but what about higher than 250% growth percentages over the next 3 decades ?
- So, if one wants to even reduce the climate impact of the vastly increasing use of “efficient equipment”, which are the appropriate answers ??
- Is it not “fighting the usual growth patterns” ? They never result in climate neutral results, if one does not deal with infrastructures, (innovative) concepts for **reducing** the cooling LOAD !
- So, it is not (only) the pure “energy efficiency” issue that is THE one to be addressed ...



Presentation on a personal basis

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