

# Workshop on energy efficiency opportunities while phasing-down hydrofluorocarbons

## Session 2 Questions from the Mobile App

1. A common theme has been that poor installation and maintenance of RAC equipment (including leaks) is critically important to delivering energy efficiency. Is there any good estimates as to the scale of energy lost as a result of these practical issues?

*Very true. These issues impact energy efficiency very much but it is difficult to give a good estimate. Poor installation and maintenance may impact in the order of 10-30%; high leakage can even lead to disfunction of the RAC equipment.*

2. What is midea plan for R 290? U got large funding for R and D? For next 20 years what would you prefer R 32 or 290.? Where energy efficiency is better in Chinese condition?

*As a manufacturer we would like to expect new regulations and standards coming from different countries and markets. We will respond to the new regulations and standards and develop our products accordingly.*

3. Is there enough focus placed in the manufacturing industry on engineering designs and components of air-conditioning equipment to withstand specific climate system (island climate)?

*The manufacturing industry is designing AC equipment including all components for different temperature classes. That means that they can be applied under specific climatic conditions, dependent on the specific design for that condition. This would also include of island climates, urban high temperature islands, any condition that can be specified).*

4. In Saudi building design.... what do you do about windows? For example, which side of building... north only? Small windows?

*One important part of thermal regulations mentioned in Saudi Arabia's presentation is windows, in which a maximum U-value requirement is set and the maximum window to wall ratio is 25% in new residential buildings.*

5. Did I understand right? R22 is still used in Saudi for new installations?

*Yes, R-22 is still used.*

6. Question to Midea's presenter: Midea is supply kits for Split ACs in country like Pakistan. What is Midea's preference for refrigerant R 290 or R 32 for room aircon. considering the environmental and servicing sector conditions.

*We would like to cooperate with the local market and standards organization. We will design the products according to whichever gas decided by the market and we are glad to participate in the new standards and regulations.*

7. As explained by the Person from Delhaize all CO<sub>2</sub> refrigerant will be released in case of power failure. How to keep the food in that case and How long will it take for repair If the whole region has a power failure and all units use CO<sub>2</sub>?

*It is not likely that all CO<sub>2</sub> refrigerant will be released in the case of power failure alone. All refrigerant can escape in case of other types of failures and bad designs, but this is unlikely to happen at the same time for all installations in a particular region/area.*

8. In the EU, we spend less than 0.22 per cent of our engineering research budget on cooling research (i.e. not even 1 per cent); how does cooling get a better share, reflective of the importance to energy and societal goals?

*It is very difficult to estimate what is the total EU engineering budget (by all entities, including companies). It is also difficult to define how much AC (cooling) manufacture takes place in the EU which would profit from engineering and research. If one could define what the average manufacturing level of energy efficient equipment in the EU is, plus the total capacity, it might be possible to define its place in the total picture. In order for cooling research to get a better share of budget, awareness needs to be raised about the importance of cooling for food, vaccines, etc. and the opportunity/benefits that exist in energy improvements in the sector.*

9. Midea: Table on 410a is misleading, it doesn't compare refrigerants but different system conditions. 410a has lower efficiency than R22 and efficiency of R290 is much better than 410a and better as R32, as shown in your table on refrigerant properties.

*The table was taken as a reference from a published article from the industry. It does not reflect the properties of the refrigerant but the specific designed systems.*

10. Question to Jonathan: Can you further explain the efficiency of refrigerants that you've showed in one slide? Why is R420a so high compared to R290 and R32?

*See answer under 9 above.*