

## Promoting Energy Efficient ACs and Low-GWP Refrigerants: Policy and Technology Approaches

Summary  
11 May 2017

The sixth SEAD Policy Exchange Forum (SPEX) focused on the most recent developments in air conditioner (AC) and refrigerant policies and technologies. This SPEX was attended by over 50 representatives from governments, international organizations, industry, and civil society.

### Highlights of the Discussions:

- Participants were interested in understanding how to determine correct sizing of AC products, and the training that goes into educating consumers when making these decisions.
- As the only regulator to currently adopt this approach, the European Commission shared lessons learned on combining energy efficiency and refrigerant requirements into a single regulation.
- Some manufacturers have already established production lines for air conditioners that use low GWP hydrocarbon refrigerants. However, they are not manufacturing these air conditioners at large scale, due to the risks involved for the servicing sector (potential lack of experience or guidelines when working with hydrocarbon refrigerants).
- When determining policies for air conditioners, the energy efficiency components generally fall under the portfolio of the Energy Ministry, whereas refrigerants are typically covered by the Environment Ministry. Participants shared experiences on improving alignment and collaboration between these policy leads to ensure a well-coordinated approach to setting these policies.
- Participants were interested in understanding how to track impacts of these policies, and the different metrics that can be used to do so.

### Summary of Presentations:

#### **Institute for Governance and Sustainable Development (IGSD)**

- IGSD provided an overview of Kigali Amendment to the Montreal Protocol and how climate-friendly ACs can help countries to meet their HFC phase-down schedule and other climate goals.
- The latest international collaboration efforts were introduced, including the Advanced Cooling Challenge and the Kigali Cooling Efficiency Program.



## Lawrence Berkley National Laboratory (LBNL)

- This presentation focused on the opportunity for simultaneous action on efficiency improvement and refrigerant transition for room ACs, particularly in emerging economies with a growing market for room ACs.
- The presentation highlighted the importance of transitioning to super-efficient room ACs, due to their significant potential to reduce peak load, energy consumption, and climate impacts.
- Under the Kigali Amendment, Room ACs will have to undergo a transition towards low-GWP refrigerants.
- A summary of the alternate low-GWP refrigerants was presented along with their impact on energy efficiency.

## Directorate-General for Energy, European Commission

- This presentation provided an overview and introduction to the EU Ecodesign program and its approach to incorporate both energy efficiency and refrigerant in the AC regulations.
- The Ecodesign program looks at all the environmental impacts from the manufacturing stage to end of life. Energy consumption during the use phase usually accounts for the highest impact.
- The presentation focused on air conditioners with cooling capacity less than 12 kW, and discussed the energy efficiency requirements and other special requirements on refrigerants and noise in EU.

## Ozone Action, UN Environment

- This presentation highlighted the challenges faced in the servicing sector of developing countries for the adoption of climate friendly refrigerant alternatives to comply with the Kigali Amendment, and explored options to improve the infrastructure of the servicing sector.

## Group Discussion and Q&A:

Some of the questions asked during this session were:

- How to achieve the right sizing of air conditioners?
  - Most end-users may not have any idea about the size of the product they need, whereas the sales person may try to sell the over-size and expensive product;
  - MLF has outreach programs to enhance awareness of consumers to choose the right size products;
  - UNEP collaborated with China Household Electrical Appliances Association to produce educational materials to encourage consumers to purchase products with the right sizes;
  - Another point to consider is to provide trainings (on how to size the equipment) to a wider group of stakeholders such as housing developers and decision makers of other bulk purchasers.
- How was the 150 GWP bonus determined in the Ecodesign regulation for ACs and will the same approach be used in future regulation revision?
  - The 150 GWP bonus was selected based on the EU preparatory study, which indicated that R410A and R407A were the two most popular refrigerants on the market, while HFOs and natural refrigerants were gaining popularity at the time of the regulation;



- Therefore, the regulation was primarily designed to incentivize HFOs and natural refrigerants.
- Now EU is setting up a new preparatory study. Preliminary results indicated that the bonus has not been used widely and no equipment (<12kW) with HFO or propane was seen on the market. However, this is a preliminary finding and further investigation is ongoing.
- For future regulation revisions, the same approach may not be used, since the EU has recently updated the F-Gas regulation, which included a phase-down mechanism. However, the final decision will be based on the outcomes of the new preparatory study.
- Has there been any trends shifting towards hydrocarbons as alternate refrigerants?
  - There is a general trend for both AC and refrigeration sectors that low-GWP refrigerants, e.g. hydrocarbons, tend to be more flammable.
  - The flammability issue is being mitigated by having different blends; however the discussions and debates on where the optimization point for flammability, GWP and price should be set, are still ongoing.
  - R32 products are widely available in many Asian countries, whereas R290 products have yet to gain market share; Large manufacturers in China such as Gree, Hiar, and Midea all have R290 product lines and the capacity to produce R290 products, but the manufacturers have not been producing R290 products in large scale, partly due to the lack of confidence in the servicing sector.
- Is there any coordination on developing energy efficiency and low-GWP refrigerants policies between Energy Ministries and Environmental Ministries?
  - In the EU, refrigerants are regulated by the European Commission and the Energy Efficiency department tries to interact with the department responsible for refrigerants regulation as much as possible. This approach worked very well with the current F-Gas Regulation.
  - UNEP has been working towards coordination among policy makers from various ministries. For example, meetings that involved both ozone officers and policy makers from energy departments have been hosted. The recent Ozone Officer Network Meeting organized by UNEP also invited participants from energy efficiency sector to encourage collaborations.
  - With initiatives like the Kigali Cooling Efficiency Program, more integration may be observed in the next few years.
- Are there tools or metrics being used to quantify, track, and evaluate the impacts of energy efficiency and refrigerants used for ACs?
  - The governments can track the energy efficiency of ACs using common test procedures and the established metrics, such as EER, SEER, and APF;
  - There are two common metrics for refrigerants: the life-cycle climate performance (LCCP) and the total equivalent warming impact (TEWI); both metrics can be used to inform the choice of refrigerants;
  - In terms of tracking impacts, LBNL has been using the International Database of Appliances (IDEA) to track various markets participating in the AC Challenge project.

If you have any questions for the presenters or to other country representatives, or would like further information, please contact the SPEX Coordinator, Yang Yu at [yyu@clasp.ngo](mailto:yyu@clasp.ngo).