Mr. Dou Yanwei (China Household Electrical Appliances Association (CHEAA), China)

Mr. Dou Yanwei is Chief of department of comprehensive affairs in CHEAA, graduated in Environmental Chemistry in 2006 from Peking University. He joined CHEAA in 2006 and worked in CHEAA until now. His works are related with the environmental protection and energy efficiency in home appliances industry and was in charge of establishing HPMPs for room air conditioner industry in China and undertaking the related activities for phasing out HCFCs in room air conditioner sector in China. He is a member of the Working Group 16 in Sub-Committee 61D for IEC 60335-2-40.
Challenges for using R290 in RAC industry in China

Dou Yanwei
CHEAA
June 2017
1. Brief introduction on works for using R290

1）In July 2011, the first stage HPMP for RAC was approved by the 64th ExCom meeting

2）Alternative: R290 as the major and R410A as the transitional

3）In December 2016, the second stage HPMP for RAC was approved by the 77th ExCom meeting

4）Alternative: R290 for RAC and CO2 for HPWH
1. Brief introduction on works for using R290

- HCFC—22

- Classification:
  - HFC-410A: A1, 1960
  - HFC-32: A2L, 675
  - HFO: A2L, 3
  - HC-290: A3, 3

- GWP:
  - HFC-410A: 1960
  - HFC-32: 675
  - HFO: 3
  - HC-290: 3

Flammability has to be faced in the near future for industry.

The industry has to prepare for using the flammable refrigerant and should avoid second conversion in future.
1. Brief introduction on works for using R290

- **Risk assessment**
  - Ignition of R290 RAC = $8.05 \times 10^{-9}$
  - Reduce charge amount
  - Improve heating performance
  - Safety measures
  - Refrigerant distribution
  - R290 compressor

- **R & D**
- **Production line conversion, 18 RAC lines to use R290**

- **Market promotion**
  - Eco-Label
  - Demo-installation

- **Training**
  - Training centers
1. Brief introduction on works for using R290 - Standard

1) Domestic standards

Product

2012

GB4706.32-2012

CCC certificate:

GB 4706.32-2012

IDT: IEC 60335-2-40:2005
1. Brief introduction on works for using R290 - Standard

1) Domestic standards

1) Domestic standards
1. Brief introduction on works for using R290 - Standard 2

International standards

IEC 60335-2-40

Participate in WG09 and WG16;

Host the WG16 meetings in China: Shenzhen and Hangzhou
1. Brief introduction on works for using R290 - Market promotion
1. Brief introduction on works for using R290 - Market promotion

In 2011, Gree installed 100 RAC using R290 in Maldives.
1. Brief introduction on works for using R290 - Market promotion

243 units, Shenzhen, Gree

1000 units, Jiaxing, Midea

53 units, Beijing, Haier
2. Challenges faced

1) Huge size of the RAC industry in China
2. Challenges faced

2) Standard

\[ m_{\text{max}} = 2.5 \times (LFL)^{5/4} \times h_0 \times (A)^{1/2} \]

- Too small charge is allowed to be used

1. Performance
2. Cost
2. Challenges faced

3) Capacity on servicing and installation, as well as certificate system

More than 110,000 servicing companies;

More than 1,000,000 servicing technicians;

Time is needed for this hard work.
2. Challenges faced

4) “Noisy” Voice and “lack” of the incentive policies

✓ Flammability ≠ unusable (refrigerator, car, gas cooker, etc…)

✓ In China and in other countries, there is nearly no incentive policies for R290 RAC, such as bulk procurement, etc…
3. Conclusion

HCFCs Phase -out

HFCs Phase -down

Which way can meet the target of both?
Thanks for your attention!

Dou Yanwei
e-mail: douyw@cheaa.org
Tel: 8610-51696560