CO$_2$ EMISSION REDUCTION & ASERCOM REFRIGERANT TRANSITION ENGAGEMENT

Régis Leportier
Refrigerant WG Convener
Steering Committee Chairman
Brussels, 24$^{th}$ January 2020
F-GAS REGULATION OBJECTIVE

- EU ORIGINAL OBJECTIVE: LIMIT THE AVERAGE TEMPERATURE INCREASE OF THE ATMOSPHERE TO 2°C.
- REDUCE EMISSIONS BY 80-95% IN 2050 COMPARE TO 1990
- IN 2015: COP 21 SET 1.5°C IN ORDER TO REDUCE GREENHOUSE GAS EMISSIONS BY 40 TO 70% IN 2050 COMPARE TO 2010
- F-GAS 517/2014 SET A “ROAD MAP” AND PROVIDES INDUSTRY CERTAINTIES ON REFRIGERANT TREND
FROM 67 IN 2019 TO 92 COUNTRIES IN 2020 WHICH HAVE RATIFIED THE KIGALI AMENDMENT TO PHASE DOWN HFCS REFRIGERANT

Source: Cooling Post press release 19-01-20
F-GAS REGULATION
IT’S « ALL ABOUT CO₂ EMISSION REDUCTION »

- **COP 25 MADRID 2019 CONFERENCE – STRONG POLITICAL MESSAGE**
  - need to step up global climate action
  - European Council endorses the objective of achieving a climate-neutral EU by 2050
  - Transition to climate neutrality bring opportunities
    - Economic growth
    - New business models & markets
    - Research & development & innovation policies will have a key role
  - Serious challenges

- **A GOOD NUMBER OF POLITICAL INITIATIVES TO ACCELERATE CO₂ EMISSION REDUCTIONS**
  - Politics understanding not aligned with EU industry.
FOR THE FIRST TIME IN OUR INDUSTRY

AT LAST G7 AND THE UN MEETINGS –

REFRIGERATION SECTOR INCLUDING COLD CHAIN, AIR CONDITIONING, CRYOGENICS AND HEAT PUMPS WAS HIGHLIGHTED ALMOST FOR THE FIRST TIME.

MR. ANTONIO GUTERRES: SECRETARY-GENERAL OF THE UNITED NATIONS” EXPRESSING:

“IMPLEMENTATION OF THE KIGALI AMENDMENT WILL BE FRONT AND CENTER FOR CLIMATE ACTION.

WE NEED ALL COUNTRIES TO DEVELOP NATIONAL COOLING ACTION PLANS TO DELIVER EFFICIENT AND SUSTAINABLE COOLING AND BRING ESSENTIAL LIFE PRESERVING SERVICES LIKE VACCINES AND SAFE FOOD TO ALL PEOPLE.

WE ARE CALLING FOR CONCRETE AND ENHANCED ACTIONS FROM INDUSTRY. THE LEADERSHIP OF GLOBAL LEADING COMPANIES IS ESSENTIAL TO REALIZE THE VISION INTO REALITY.”

Source: IIF IIR News letter Dec. 2019
“HFC PHASE DOWN CONTINUES TO BE SUCCESSFUL IN PROMOTING INNOVATION AND A SHIFT TOWARDS CLIMATE FRIENDLY SOLUTIONS”
THE REAL SITUATION IN THE FIELD ?
REFRIGERANT WG - 2019 ACHIEVEMENTS

Technical Aspects
TECHNICAL CHALLENGES TO ACHIEVE F-GAS TARGET

- Performance test results,
- Effort to redesign all components (New & Retrofit),
- Lubrication aspects: miscibility; viscosity; compatibility,
- Product qualification; Cost of Certificates renewal,
- Application impact: temperatures, pressures, performances,
- Refrigerant Library: common data base for labs & manufacturers,
- Flammability: A2L; A3; ATEX; refrigerant charge limits
- Safety of usage: qualification of personnel, training
- Economic impact: availability, energy saving

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>⚪</td>
<td>⚪</td>
<td>OK</td>
</tr>
<tr>
<td>Redesign</td>
<td>⚪</td>
<td>⚪</td>
<td>OK</td>
</tr>
<tr>
<td>Lubrication</td>
<td>⚪</td>
<td>⚪</td>
<td>OK</td>
</tr>
<tr>
<td>Product</td>
<td>⚪</td>
<td>⚪</td>
<td>NOK</td>
</tr>
<tr>
<td>Qualification</td>
<td>⚪</td>
<td>⚪</td>
<td>OK</td>
</tr>
<tr>
<td>Application</td>
<td>⚪</td>
<td>☑</td>
<td>OK</td>
</tr>
<tr>
<td>Refrigerants</td>
<td>⚪</td>
<td>☑</td>
<td>OK</td>
</tr>
<tr>
<td>Flammability</td>
<td>⚪</td>
<td>⚪</td>
<td>OK</td>
</tr>
<tr>
<td>Safety</td>
<td>⚪</td>
<td>⚪</td>
<td>Need Effort</td>
</tr>
<tr>
<td>Economic</td>
<td>⚪</td>
<td>⚪</td>
<td>Need Effort</td>
</tr>
</tbody>
</table>
The HVACR industry faces significant product and technology changes. Most of our current products have to be qualified or redesigned to meet the very ambitious targets of the F-gas Regulation. This is a time and lab capacity consuming process without precedence in the industry. The flammability of the alternative refrigerants changes the landscape to a much larger extent than the change from CFCs to HFCs ever did.

- September 2017
- Publication of a statement about:
  - Refrigerant Scenario
  - Aligned with the F-Gas Regulation
COMMUNIQUÉ ON F-GAS REGULATION AND REFRIGERANTS TRANSITION

The new F-gas Regulation 517/2014 brought with it new requirements for the whole HVACR industry, as well as manufacturers and end-consumers. This statement describes the current market situation and provides a set of measures that are necessary to achieve the defined F-Gas targets.

• Support our industry in the critical environmental transition period started early 2018 to 2030 with appropriate availability of lower GWP substances to cope with the F-gas phase down mechanism.

• Pursue our technical contribution to F-gas success by consistently raising awareness to European contractors and the RAC-industry during this learning curve period.

• Keep strong focus & effort in the evaluation of sustainable alternatives, limiting the proliferation of refrigerants in the EU market place.

• Offer a range of redesigned and qualified components for the use of sustainable alternatives, including low GWP synthetic as well as natural refrigerants like CO2, ammonia or HC refrigerants.

• Increases service technicians’ knowledge by encouraging dedicated training courses to new future alternative challenges (e.g.: flammability, high pressure aspects)
Update of « specific » statements

- **HCs**
- **CO₂**

**November 2018**
COMPONENT FOR USE WITH FLAMMABLE REFRIGERANT

- This new guideline outlines the conditions & frames for usage of components in vapor compression circuits comprising flammable refrigerants
  - Qualified Components can be applied.
  - The system builder has to make a risk assessment for the system.
- Low GWP alternative refrigerants may have an impact on the safety and efficiency of systems
- A generic non-flammable, non-toxic and energy efficient refrigerant remains a big issue or challenge
COMMUNICATION - REFRIGERANT

2018/2019

Participation with EPEE in publications
July 2019

Publication of a statement about:

Retrofit or maintenance with another refrigerant

Strong message about Best Practice

Relay of AFCE leaflet
 Refer to EU standard for performance declaration

 On going draft including precise definition

 Allow fair comparison as long as we compare product to product.

 The future annex will integrate the temperature glide impact inherent to most of new refrigerant offered with sub<150 GWP
ASEREP REFRIGERANT LIBRARY

- A unique tool for Refrigerant data
- New development allowing the use of new refrigerant fluid file data.
- Generate numerical reliable refrigerant equations
- Very fast processing speed.
- Possible maintenance addition of new developments.
- Under testing within ASERCOM WG members
Concerned by any refrigerant leakages from systems, we strive to work with partners to achieve the best possible system containment at all times.

Leakages, in addition to impairing system performance can, in the case of HFC's:

- have a direct effect on global warming,
- and in the case of other refrigerants a detrimental and possibly dangerous effect on the immediate environment.
WHAT’S NEXT?
2020 CHALLENGES
JOINT ACTIVITIES AHRI-ASERCOM

- REVIEW EFFORT IN EU & US TO STANDARDS UPDATE IN REGARDS TO REFRIGERANT TEMPERATURE GLIDE
- DEVELOP A JOINT COMMUNICATION ON THE TEMPERATURE GLIDE
CHALLENGES TO ACHIEVE PHASE DOWN (3)

Proliferation of alternative is counterproductive for appropriate transition

Source: ASERCOM - 2018
Regulations and standards linked to refrigerant’s concern remain key focus for ASERCOM WGs
REFRIGERANT WG

Arno Kaschl presentation at AFCE Colloquium 2nd of October:

Pursue actions towards:

• Update safety standards

• Mandate M555 to EU standization organizations

• IEC 60335-2-89:
  • Need to become an EN standard
Joint Activities AHRI-ASERCOM

Uncertainties in Compressor Performance

A Presentation of the AHRI

Tolerances and Uncertainties in Performance Data of Refrigerant Compressors

January 2017

ASERCOM General Assembly / Brussels / 24th January 2019
Refrigerant GWP is the current focus in regards to CO2 emissions reduction

Total equivalent warming impact (TEWI) of a system provides a more accurate representation of the overall environmental impact.

Carbon emissions differs from a simple GWP analysis to the TEWI calculation once we look at Climate Impact.

This summations of cost estimates from inception to disposal for

- equipment and projects as determined by an analytical study
- and estimate of total costs experienced during their life.
2020 GENERAL ASSEMBLY
CO$_2$ EMISSION REDUCTION &
ASERCOM ENGAGEMENT