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APPLiA's comment paper on the Commission final report regarding non-fluorinated gases alternatives for new split air-conditioning systems

APPLiA, the EU trade Association representing manufacturers of home appliances, including heating, ventilating and air conditioning equipment, would like to inform competent authorities of its stance regarding a final report called "*The availability of refrigerants for new split air conditioning systems that can replace fluorinated greenhouse gases or result in a lower climate impact*"[1].

We would like to reiterate some of our comments and concerns, regarding some statements of the Commission's final report, as well as its main conclusion, especially related to the potential of propane (R290) in small single split air-conditioning systems with a cooling capacity below 7kW.

Back in April 2020, APPLiA had already provided input and further recommendations[2] to both the Consultant in charge of the study (Öko-Recherche), and DG CLIMA.

This paper reflects the home appliance sectorial position, and APPLiA further invites EU, national, and international competent authorities in charge of the fluorinated gases policy-area, to kindly address our concerns and consider our recommendations along the future impact assessment exercise, part of the upcoming evaluation of Regulation (EU) No 517/2014 ('F-Gas Regulation'). Finally, we would like to formalize our request to receive the list of equipment using R290 as kindly inquired in point 8 of this comment paper.

1. Reversible air-to-air heat pumps missing in the report' scope (section 1, p.1)

APPLiA would like to remind authorities that the scope of Article 21(4) of Regulation (EU) 517/2014 involves reversible air-to-air heat pumps that are directly cooling, but also heating. Reversible air-to-air heat pumps are increasingly used not only to cool, but also to provide heating to buildings in an energy efficient manner. Thus, not only contributing to the decarbonisation of the building sector, but also to the future energy-efficiency improvements required, as a result of upcoming (stricter) Ecodesign requirements. Indeed, the upcoming energy efficiency requirements for Air-condition will increase by as much as 30%. This should not be omitted when considering alternatives in splits.

2. R466A is not yet classified under standard EN 378-1 or ISO 817 (Table 1, p.3)

We would like to highlight that R466A has not been classified as "A1" yet under standard EN 378-1 or ISO 817. Consequently, we believe that its presence in Table 1 of the final report is not accurate, since, presently, R466A cannot be identified as one "*of the most relevant refrigerant alternatives currently available for split systems*". The current lack of classification needs to be mentioned in this context.

[1] Report from the Commission, C(2020) 6637, Brussels 30.09.2020 (here).
[2] APPLiA/Eurovent joint Position paper on Article 21(4) and new small single-split air-conditioning systems under the F-Gas Regulation (EU) 517/2014, Brussels 20th April 2020.

3. The Ecodesign Directive is a dynamic piece of legislation (section 2.2, p.4)

The Ecodesign Directive implementing regulation for air-conditioners with a rate capacity of up to 12kW, is a dynamic piece of legislation. Typically, its energy-efficiency requirements are getting stricter with time, at each revision. The impact on energy efficiency of the appliances (be it positive or negative) needs to be taken into account when potential restrictions for refrigerants are considered. Indeed, the upcoming energy efficiency requirements for Air-condition will become as much as 30% stricter. In general, it is worth to emphasise that transparency within the Ecodesign process is ensured via several and regular stakeholders' meetings and consultations forums. Finally, we would invite the EU Commission to take into consideration the Ecodesign methodology (MEErP) which includes a complete life-cycle assessment including the refrigerant use.

4. Caution is needed when R290 is identified as a generic alternative for new single split air-conditioning systems (section 3.1, p.5, Technical Annex, p.10)

We would like to, first, remind about the current low level of training of service personnel and certification for A3 refrigerants, such as for R290. Thorough training on A3 refrigerants, such as R290 is not yet part of any EU certification scheme with regards to installers and service companies, since the refrigerant does not fall under the requirements of Regulations (EU) 517/2014 and (EU) 2067/2015. As such, a considerable safety-risk currently exists when considering using R290 as a refrigerant in small split air-conditioning applications in the EU. Therefore, "*trainings on flammable refrigerant use for installers and service companies*" is an essential measure to implement, further, establishing an EU-wide qualification/verification program for such alternatives is equally as essential, i.e. R290 needs a certification scheme for installers and service companies at the EU-level, prior it is considered as being a "real" alternative by the competent authorities. Safety of use, installation, servicing, maintenance of equipment using A3 can currently not be guaranteed. Further, using R290 needs specific technical and legal requirements to be fulfilled, such as safety-classified stores (i.e. warehouses) to stock the charged units with the refrigerant, strict transport-measures, etc. All the points mentioned before should be considered whenever discussing R290 as an alternative to R32 for small single-split air conditioners.

We believe that R290 cannot, at this moment, be considered as a generically viable alternative for all new single split systems. The conclusion on R290 from the final Commission report lacks supportive explanation and/or scientific evidence substantiating it. For this reason, we believe that further assessment is needed throughout the f-gas preparatory study currently being carried out, before moving to such conclusions and using these as an input to the F-Gas Regulation review process.

5. Using R32 in new single split systems results in a reduction of charge of 20% **or more** (section 3.2, p.6)

We would like to inform that the possible reduction of charge, as a result of using R32, is greater than 20% (in some models already up to 30%) compared to using e.g. R410a, very much depending on the system's design. Further, Ecodesign requirements have indeed an impact on the charge amount, with higher efficiencies typically needing more refrigerant. However, we would like to highlight that this latter statement applies to all refrigerants, not only to R32.

As a complementary information to the next statement found in the final report "*[…] R32 units are also fully cost-effective compared to R410A*", we would like to inform that total material costs for R290 units are higher than for units running on R410A or R32, even if the refrigerant R290 itself has a lower cost. Indeed, R290 units need more copper, aluminum, and other metals to achieve the same capacity output as R32 units, for example, due to the chemical characteristics of R290.

6. Addressing the restricted use of R32 in public and high-rise buildings in France (section 3.2, p.7)

Concerning the "Market readiness" of A2L and A3 refrigerants in Europe, we would like to remind that the use flammable refrigerants (A2L and A3) is presently restricted in some public and high-rise buildings in France. This latter situation is consequently preventing the installation of equipment with A2L/A3 and other flammable refrigerants in those buildings. This remains a major barrier to the transition to flammable refrigerants. The current CH35 cannot be considered as a sufficient improvement and further work is needed there.

Despite the Commission's comments on the draft French legislation through the TRIS procedure, the French final legislation was not modified yet and is not in line with the CE marking/harmonized approach and the rules of the EU single market. Therefore, in our view, it is important to highlight the French situation when discussing the "Market readiness" of flammable refrigerants in the EU. It is equally important to address this situation and remove such a restriction in public and high-rise buildings in France.

7. Rectifying the Conclusions of the final report regarding identifying R290 as a viable refrigerant for all new single split systems (section 4, p.8)

Since the Consultant, Öko-Recherche, did not study all the related and existing models of split systems, indoor units types, and piping lengths that are necessary for the EU market, we consider that such a generic conclusion, i.e. identifying R290 as a viable refrigerant for all new single split systems, should not be provided by the Commission in its final report. We strongly recommend to further address the concerns as raised throughout this paper, and not to import the conclusions from the final report, "as such", to the F-Gas review preparatory study.

A thorough assessment including cooling and heating, of all different types of indoor units, piping lengths, future Minimum Energy Performance Standards (MEPS) levels, and additional potential energy improvements (the consideration should not only be made in relation to the MEPS as consumers are encouraged to go for higher energy labels than the MEPS), would be necessary to conclude if, and for which applications, R290 could be a viable alternative.

Further, regarding the choice of a refrigerant by a manufacturer, we would like to inform that it relies on several aspects, such as (i) technical feasibility, (ii) safety, (iii) energy-efficiency (and further improvements potential of such refrigerant), (iv) cost-effectiveness, etc. Therefore, considering and identifying a refrigerant as a "real" alternative for new small single-split air conditioners should not be solely based on the fact that it would be technically possible to build-up an appliance to use such gas in such equipment.

In addition to the choice of refrigerants (and their related GWP impact), reducing their charge in equipment, avoiding leakage, and increasing their recovery and reuse will also contribute in mitigating climate change and reaching the (reduced) CO_2 emissions targets.

We also have a comment on the following generic statement as found in the final report: *"[…] A further significant reduction of the GWPs of alternatives to e.g. below 150 may be possible in small single split systems in the medium term if the above constraints are addressed effectively"*. As formulated, this would apply to all versions of such small systems. We do not support such an absolute conclusion at this stage. Lastly, regarding the time frame ("medium term") of this possibility, it will still take many years for a refrigerant with a GWP below 150 to be recognised under ASHRAE, ISO and EN standards, and for products to be developed using such refrigerants.

8. Request for a list of examples of equipment using R290

As the EU Commission has highlighted in its final report, in pages 5 and 8, APPLiA would like to kindly understand the (scientific) evidence, based on existing and expected future EU and national legislation, that the Commission used to state and conclude on R290. For instance, we would be highly interested in receiving from DG CLIMA, a list of equipment (e.g. brand, model) currently using R290 units in the EU, and in other parts of the world.

This latter list of equipment would allow APPLiA to share valuable information with its members, for them to further assess and understand the possibilities and limits of use of such a refrigerant in future and new small single-split air conditioning systems in the EU, as well as to also potentially provide DG CLIMA with relevant information about the feasibility or possible limitations of such equipment examples.

We invite all competent authorities, EU, national and international ones, to consider our input as laid down in this comment paper. We further kindly recommend EU competent authorities to take into account and consider our arguments, as well as address our concerns, whenever the impact assessment exercise starts, i.e. along the start of the evaluation process of the F-Gas Regulation.