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Evaluation and impact assessment for amending Regulation (EU) No 517/2014 on f-gases: APPLiA comments and questions

1. Executive summary

APPLiA, representing EU manufacturers of home-appliances, including large domestic appliances, small domestic appliances and heating, ventilation, and air conditioning (HVAC) equipment, would like to provide the European Commission with the views of the sector on the evaluation and impact assessment process to amend Regulation (EU) No 517/2014 on fluorinated gases (f-gases), i.e. the EU F-Gas Regulation.

First of all, we would like to carefully highlight the scope of APPLiA, covering the following domestic equipment:

- Refrigerators and freezers;
- Heat pump water heaters (without space heating function);
- Ice cream makers;
- Dehumidifiers;
- Heat pump tumble driers;
- Heat pump washer driers;
- Fixed single/multi-split air conditioners (<12kW);
- Double duct air conditioners;
- Single duct air conditioners;
- Dishwashers with heat pump technology.

This latter further means that the content of this paper should be taken into consideration within the boundaries of the mentioned-above scope and related equipment.

In the case scenario where the ambition of the F-Gas Regulation would be increased for some categories of products, it should not be increased in relation to the HFC phase-down process and prohibitions of using f-gases in heat-pumps, in so far as heat-pumps are key technologies to decarbonise space heating and cooling, and water heating.

Moreover, for safety reasons, the use of A2L and A3 refrigerants is not always welcome in some national regulations across the EU. Regarding this latter aspect, we believe that banning refrigerants with a GWP>150 for all categories of heat-pumps with a cooling capacity below 12kW is totally unrealistic.

Regarding the new 2030 and 2050 climate goals as set in the EU Climate Law, the F-Gas regulation should fully consider these, while not jeopardizing the "Energy Efficiency First" principle.

On another note, APPLiA would support stricter requirements on leak checks, including extending these to flammable refrigerants.

Lastly, home appliances and HVAC equipment manufacturers need reasonable time to implement new technologies, while ensuring appropriate timing to implement training and certification as well.

2. Key messages: sectorial position from APPLiA

This next section highlights several key messages from our sector, particularly with regards to splits air-conditioning systems under 12kW and household heat pumps.

2.1 Fixed air-conditioners with a cooling capacity below 12kW

Considering that the EU Commission is looking into policy options for fixed air-conditioners with a cooling capacity below 12kW using refrigerants with a GWP<150, we would like to reiterate some key points to carefully consider during the modelling process, but also when building-on towards the next steps of the F-Gas Regulation review:

- As there are no studies available identifying all the related and existing models of split systems, indoor unit types, and piping lengths that are necessary for the EU market, R290 should not be identified as a viable refrigerant for all new fixed air-conditioners with a cooling capacity below 12kW systems at this stage. A thorough assessment including cooling and heating, of all different types of indoor units (such option could actually *de facto* ban certain indoor units from the EU market – floor mounted types for instance), 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, refrigerants with a GWP<150 could be a viable alternative. **This has been requested since last year by APPLiA and the modelling/presentation given on May 6th failed to address such crucial points**.
    - The definitions, the very few modelling information given, and interim results so far presented do not allow industry to properly assess the modelling data inputs, assessments, and determined paths. We have no information on how a 'split unit' has been considered for the purpose of the modelling. **We also fail to see the link and the cross-checks with ongoing energy policies such as the Ecodesign Lot 10 review study**. We strongly encourage the Consultant mandated to carry out the F-Gas Regulation review study and the Commission not to look both in isolation.
        - According to the Lot 10 review study[1] of Regulation 206/2012 and 626/2011 on air-conditioners and comfort fans, respectively, the Consultant determined two representatives' units for the EU market: a 3,5kW unit and a 7,1kW unit.

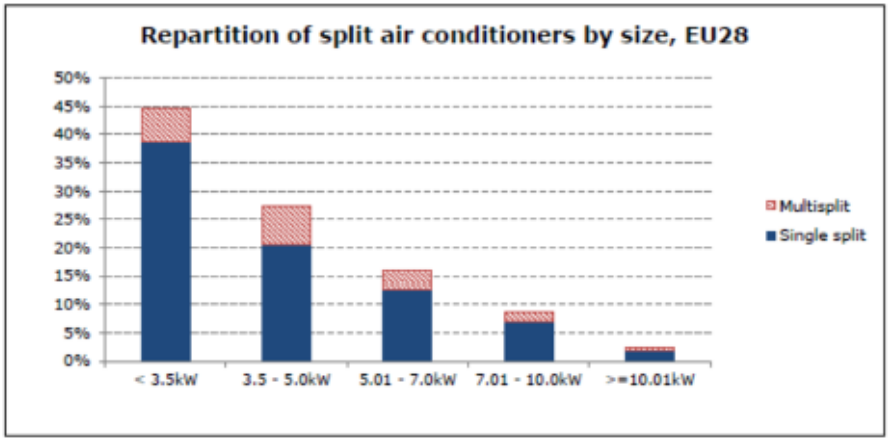


Figure 7: Split sales distribution by size, source BSRIA.

[1] ARMINES, Viegand Maagoe and. Preparatory study: review of Regulation 206/2022 and 626/2011 on air-conditioners and comfort fans. 2018.

RTOC[2] Report places the average size for split units at 3.8kW, and the smallest unit at 2.0kW. While another recent study puts the average capacity of installed room air conditioners in Europe between 4-5kW[3].

- It is equally important to recall that **splits A2A equipment are in their vast majority reversible**. The Lot 10 estimated that a split AC functions 350 hours at cooling full load, and 1400 hours in heating mode. We would appreciate to understand which projections have been used in the model as presented by the Consultant back in May 2021. Indeed, we fear that the Consultant has approached the split sector as a 'cooling only' sector, fully setting aside the importance of A2A heat-pumps in EU's decarbonization process.

- **Efficiency and reversibility of the system need to be considered while modelling** the feasibility of shifting to refrigerants with more restricted charge sizes. As seen in the Figure herein below, a higher charge is required to achieve higher efficiency, synonym with lower lifecycle emissions to satisfy the increasing requirements from the Ecodesign legislation.

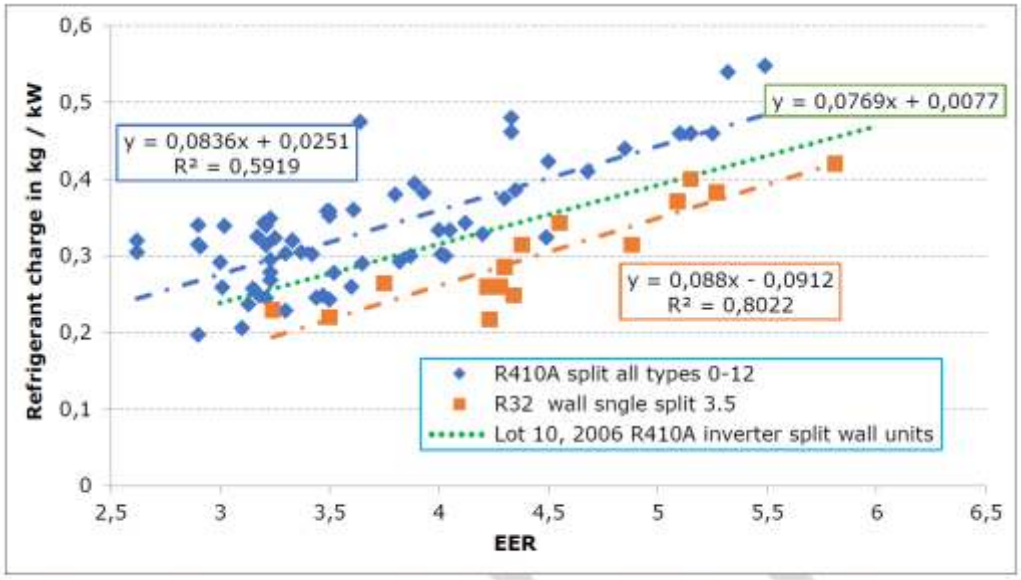
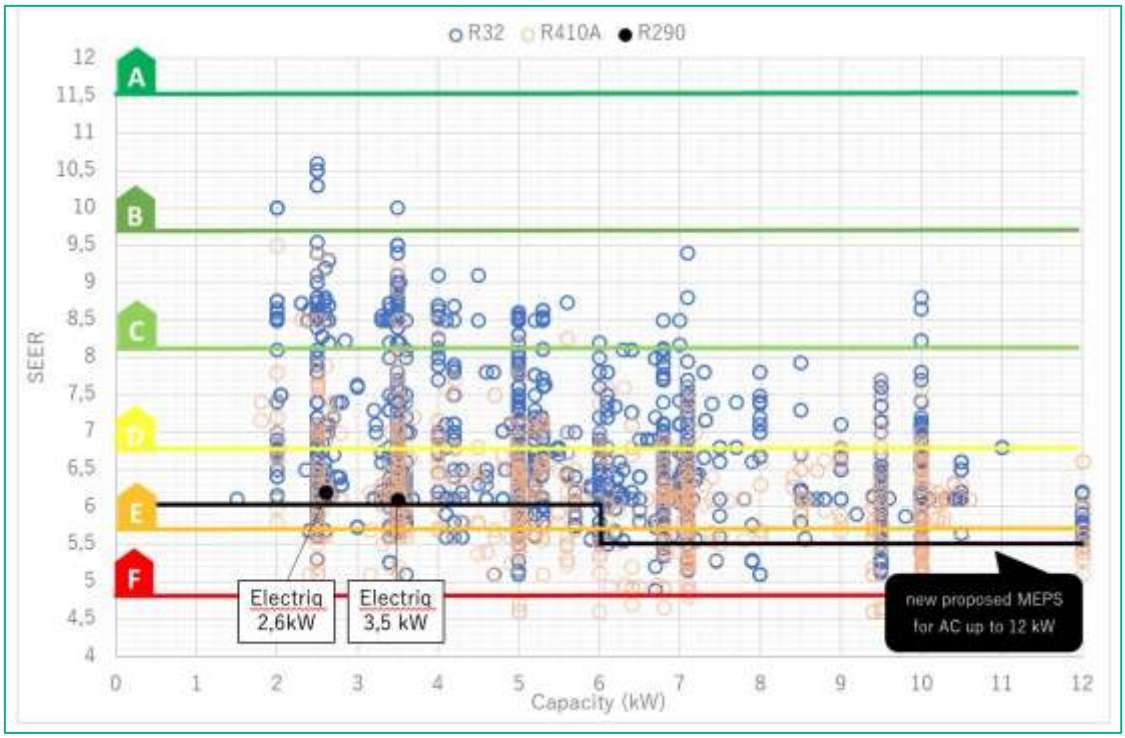


Figure 9 EER versus specific refrigerant charge in kg/kW (capacity and EER at T1 condition), 5 m piping length

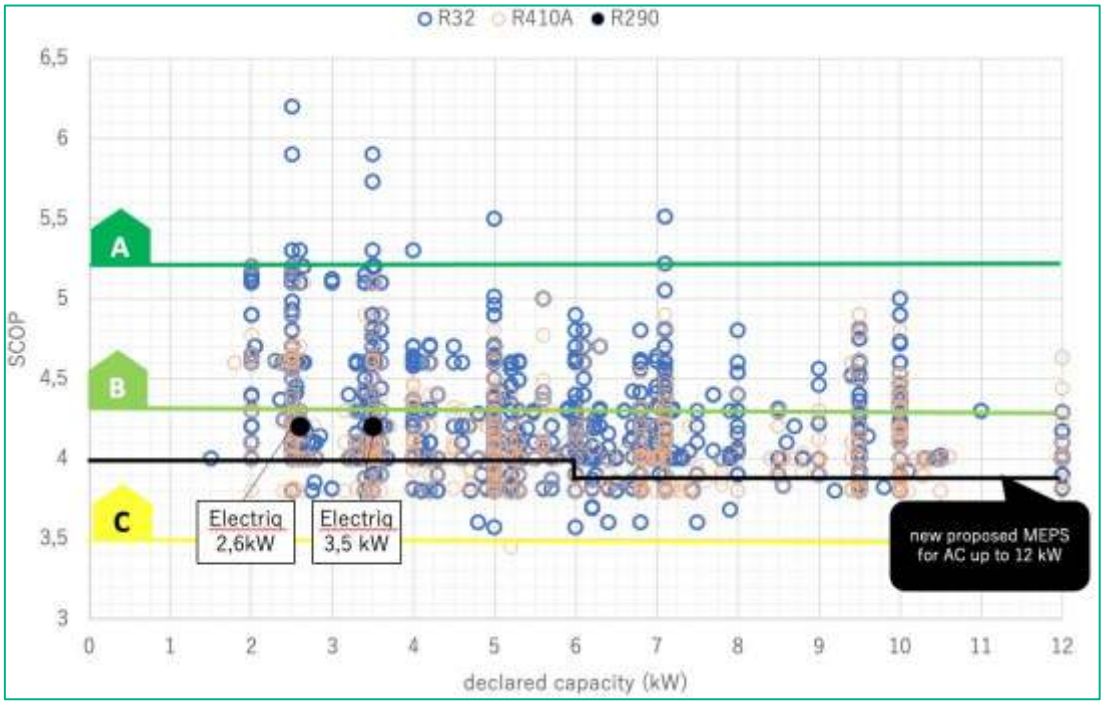
According to this Figure (extracted from the Lot 10 review study), the refrigerant charge per kW of R410A to comply with the new MEPS should be around 0.4 kg/kW and up to 0.5kg for the most efficient units. **Safety requirements accompanying highly flammable refrigerants** consequently limit the equipment in achieving an equivalent energy-efficiency as compared to those using non-flammable, or slightly flammable refrigerants. For this reason, it is unlikely that systems using these highly flammable refrigerants would be able to provide an equivalent efficient system with a capacity higher than 3kW with the current state of art component technology and the necessary piping lengths for installations in Europe.

[2] RTOC. 2018 Report Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee. 2019.
[3] Status Quo of the Air-Conditioning Market in Europe: Assessment of the Building Stock. Simon Pezzutto 1, Matteo De Felice 2 ID, Reza Fazeli 3, Lukas Kranzl 4 and Stefano Zambotti 1. 2017.

- The reversibility of the system also limits the possibility to use charge reduction measures that are possible for "cooling only" systems. Introducing lower efficiency systems (due to the restriction of charge, or the properties of an ultra-low GWP refrigerant) would be counterproductive, as most emissions are generated by electricity consumption during the use phase of the equipment. Last but not least, it should not be forgotten that the energy efficiency minimum requirements and best in class for cooling are forecasted to become 30% stricter in the next years, as the ErP and EL legislations for those products are currently in the last phases of review. Thus, with **limitations linked to charge, installations (room area), new energy efficiency targets, and piping lengths**, it is unlikely that such system would be able to reach the highest (and feasible) efficiency levels. The graphs herein below provide a visualisation of this paragraph.



SEER = Seasonal Energy Efficiency Ratio for cooling.



SCOP = Seasonal Coefficient of Performance for heating.

The graphs show a mapping of the current split air-conditioning landscape. The values of such graphs have been taken from the Eurovent certification database, and they would be further visible in the EPREL database. The Electriq unit (only R290 unit on the market in Europe to our knowledge – online sales only) has been added to the graphs. As seen, models currently have an A++/A+ label for cooling/heating. In the new energy labels, they would be label E/C. Regarding the SCOP-graph, we would like to highlight that the R290 units shown in the diagram would not meet the future MEPS level, as well as some R32 and R410 models.

- There is a 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 the F-Gas Regulation and Regulation (EU) 2067/2015. As such, a considerable safety-risk currently exists when considering using R290 as a refrigerant in fixed air-conditioners with a cooling capacity below 12kW 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 should be considered whenever discussing R290 as an alternative to R32 for use in fixed air-conditioners with a cooling capacity below 12kW.

We would like to highlight that the choice of a refrigerant by a manufacturer 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 fixed air-conditioners with a cooling capacity below 12kW 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 to mitigating climate change and reaching the (reduced) CO_2 emissions targets.

2.2 Heat pump-based technology

Concerning heat pump-based technology, we would like to reiterate the message we provided during the stakeholder workshop of May 2021:

- To reach the (new) EU climate targets, new and more advanced technology will need to be deployed, such as heat pumps, on a large scale, instead of "sticking" to the conventional technology. It is important to understand that, for some applications (like heating of buildings), fluorinated gases are needed and will play a central role in reaching the new EU climate targets by 2030, and later by 2050.

- Further, 80% of total EU greenhouse gas emissions (GHG) today are related to energy production and energy consumption. The heating and cooling sector represents almost 50% out of the total and final energy consumption. Lastly, 80% (or 4/5) out of these 50% is allocated to fossils fuels being used for heating purposes[4]. Therefore, it is important to emphasise that heat pump-based technologies' deployment is necessary and will play a central role to mitigate GHG emissions in the EU, to achieve the EU climate targets, as well as for the decarbonisation of buildings under the Green Deal, and the decarbonisation of the energy-infrastructures (e.g. demand side flexibility) as put forward in the Energy System Integration Strategy. This latter goal, i.e. decarbonisation of buildings and energy- infrastructures, should be considered whenever addressing the future of the F-Gas Regulation.

- Whatever policy option the Commission would be looking at for the future of the F-Gas Regulation, competent authorities and their appointed Consultant should always keep in mind that there are multifunctional equipment which can provide both cooling and heating functions, i.e. that that both cool and heat buildings. For instance, fixed air-conditioners can be used to both heat and cool buildings, whereas movable room air-conditioners would solely cool areas.

3. Follow-up questions from Oeko-Recherche: APPLiA feedback

Under this section, we would like to answer specific follow-up questions from the Consultant, Oeko-Recherche, as stated during the stakeholder workshop regarding the F-Gas Regulation review process.

As such, we will focus under this section on the following main sub-topic: concrete examples of national/regional/local rules which would hamper the use of alternatives to conventional F-gases.

[4] Eurostat: SHARES summary results 2019, A renovation wave for Europe 2020, EU Strategy for heating and cooling, 2016. Online source here.

Concrete examples of national/regional/local rules – barriers

Firstly, we would like to re-iterate the **French situation**. Indeed, the use of flammable refrigerants (A2L and A3) is presently restricted in some public and high-rise buildings in France. Consequently, the installation of equipment with A2L/A3 and other flammable refrigerants in those buildings is being prevented. This remains a major barrier to the transition to flammable refrigerants. The current CH35, covering public buildings, and the GH37, covering high-rise buildings represent two important barriers to the use of A2L and A3. Please kindly refer to the two French decrees documents accompanying this written contribution from APPLiA.

Between 2015 and 2020, **Italy and Spain** also worked on amending their national building codes and fire prevention rules in buildings to allow installation of flammable refrigerants (especially A2L) in certain types of public buildings. For example, in Italy, the installation of Air-conditioning systems, both central and decentralised, with flammable and toxic refrigerants, mainly in existing buildings, ante 2015, was more restricted than EU standards EN 378 or IEC 60335-2-40 product standards. The use of A2L or A3 gases was restricted in the relevant types of public buildings (Hotels, Malls, Buildings for Public Shows, Hospitals, Schools, Offices, Kindergartens, Airports, etc.) as activities subject to fire prevention controls. In 2020, A2L have been gradually allowed in various public buildings.

In Spain, a similar path was followed, the RSIF was officially amended in 2020, in line with EN 378, higher charges are allowed for refrigerants that meet the requirements of the new category 2L, allowing a wider range of solutions in various applications and locations.

The next Table[5] summarizes the different pieces of legal text to carefully consider, regarding the three next countries of interest, France, Italy, and Spain.

Thanks for checking the accompanying excel document, specifically when it comes to the Italian situation.

We believe it is essential that these situations do not happen once again in the future, i.e. setting EU ambitious targets while not addressing beforehand national barriers.

Ensuring this latter will undoubtedly secure a smooth transition to using lower GWP refrigerants and a well-functioning Single Market.

France	
Établissements Recevant du Public, ERP, Article CH35	The Interior Ministry of France - more specifically the General Direction for Civil Security and Crisis Management - published in December 2017 a practical guide on the fire safety for stores and shopping malls. The guide deals with the use of flammable and mildly toxic refrigerants (A2L, A2 and A3 according to EN 378) in plug-in units installed in the areas open to the public in stores and shopping malls. Under the new guidance, for instance, the maximum permitted R290 charge per circuit is 1.5 kg in circuits located on the ground floor of the retail facility and 1 kg in circuits located in underground areas accessible to the public (in line with updated European standard EN 378-1). The guide is targeted at designers, building owners, building operators, equipment installers, technicians, safety officials, and administrative authorities.
Italy	
• D.M. 9/04/1994 (Hotels); • D.M. 27/07/2010 (Malls); • D.M. 19/08/1996 (Buildings for Public Shows); • D.M. 18/09/2012 (Hospitals); • D.M. 26/08/1992 (Schools); • D.M. 22/02/2006 (Offices); • D.M. 16/07/2014 (Kindergartens); • D.M. 7/07/2014 (Airports); • D.M. 18/07/2014 (Freight).	Safety legislation in Italy forbids the use of flammable refrigerants in certain types of public access buildings (e.g. hotels, schools, offices, etc.). The rules specifically affect central and localised air-conditioning. They do not apply to refrigeration or heating-only heat pumps.
Spain	
Royal Decree 138/2011	The requirements set for A3 refrigerants are similar to those in EN 378 except in public access areas where it is only possible to use sealed systems. This creates a barrier to non-sealed systems using hydrocarbons e.g. small split air-conditioning. The maximum charge per installation is 2.5kg, where installation refers to the entire retail space.

[5] Report: Impact of Standards on Hydrocarbon Refrigerants in Europe – Market research report, October 2018. Online source here.

4. Briefing paper: APPLiA recommendations and follow-up questions

Kindly note that this section has been structured in the same manner as the Briefing paper from the Consultant. Therefore, the herein below titles and subtitles follow the same number-format as the Briefing paper.

4.1 Key findings under each evaluation criteria

1.1 Effectiveness

- *Overall findings: The Regulation has been mostly effective in meeting its original objectives and the individual measures were found to work together to meet the objectives. The effectiveness of the Regulation as a whole would have been impacted if one or more of the measures had not been included. That said, forward modelling indicates that the original climate goals set for 2030 may not be fully reached. In addition, there are a few challenges such the continued use of some high global warming potential (GWP) F-gases in some sectors where this could be avoided, the occurrence of illegal trade and the multiplication of bulk importers.*

On the above-underlined statement, we would like to highlight that there is almost none, or very little, background data to support the Briefing paper's main preliminary findings and strong statements as this latter one.

We would be keen on receiving more factual evidence, modelling methodologies and results, as well as more explanatory paragraphs on all Figures and Tables of the Briefing paper.

The further explanatory background information would provide **more clarification on where the gaps would be**, with a view of reaching the (new) EU climate targets.

- *Objective 2: Prevent leakage from equipment and proper end of life treatment of F-gases in applications*

  Prevention of F-gas leakages from equipment is key to achieving significant emission reductions. The Regulation has continued to address prevention of leakage from equipment and the provision of proper end-of-life treatment. Data available from surveys in a number of Member States have shown the importance of regular leakage checks and associated servicing activities, especially in the commercial refrigeration sector, as leakage rates have declined (further) in recent years. Enforcement and compliance with containment and leakage checks was raised as an area which required further attention to ensure effectiveness.

On this latter, data from Member States (MS) clearly show that containment has improved, and leakage rates have gone down drastically along the years, but what is not clear to us is **how the AnaFgas model is taking this into account, or not**. Indeed, we would be keen on understanding "if and how" the modelling methodology and program takes this information and data into account, and how it is further processed by the Consultant and/or the competent authorities.

1.2 Efficiency

- *Overall findings: The Regulation has resulted in significant emission savings at very low abatement costs linked to technological change. At the same time higher HFC prices, due to the phase-down, implied higher gas cost to end-users that were still using HFCs. These costs were on the other hand offset by equivalent benefits to companies in the HFC supply chain.*

  The Regulation has delivered significant environmental benefits since its entry into force: it achieved savings in F-gas emissions of 44 million tonnes of CO_2 equivalents cumulatively until 2019. As for the impacts on energy consumption, stakeholders stated that higher energy efficiency was achieved with F-gas alternatives, especially in new installations, for example in transcritical CO_2 supermarket systems (energy savings of at least 10-14% annually in LIFE C4R project). Generally, new products on the market employing F-gas alternatives are achieving at least the same energy efficiency as comparable products based on F-gas technology.

On the above-underlined statements, we would like to emphasise that the energy-efficiency of home appliances and HVAC equipment has indeed improved along the years, however, this latter is a direct consequence of the development and successful implementation process of different pieces of relevant EU legislations, including the Ecodesign Directive 2009/125/EC, the Energy Labelling Regulation (EU) 2017/1369, and their accompanying specific implementing measures on such household products. This is equally true for either f-gases, or non-f-gases based appliances/equipment.

The conclusion from the Briefing paper stating that that appliances/equipment functioning on non-f-gases technology would be more efficient (or at least "as efficient") than those functioning on f-gases, is simply **misleading and should not be a general statement applying 'as is' on all appliances/equipment**.

This latter being said, we would strongly recommend and suggest that both the Consultant and the competent authorities leading the work on the F-Gas Regulation review process to fully consider all these following pieces of EU legislations:

- Ecodesign Directive 2009/125/EC & Energy Labelling Regulation (EU) 2017/1369:
  - Air conditioners and comfort fans: (EU) No 206/2012 & (EU) No 626/2011
  - Water heaters and hot water storage tanks: (EU) No 814/2013 & (EU) No 812/2013
  - Air heating products, cooling products, high temperature process chillers and fan coil units: (EU) No 2016/2281 & N/A
  - Household Refrigerating appliances: (EC) No 643/2009 & (EC) No 1060/2010
  - Household Tumble driers: (EU) No 932/2012 & (EU) No 392/2012
  - Household combined Washer driers: N/A & 96/60/EC
  - Household Washing machines: (EU) No 1015/2010 & (EU) No 1061/2010
  - Space heaters and combination heaters: (EU) No 813/2013 & (EU) No 811/2013
- Directive amending the Energy Performance of buildings (EU) 2018/844
- Directive amending the Energy Efficiency (EU) 2018/2002

Energy efficiency is an important factor to take into account. Care should be taken that any review of the F-Gas Regulation ambitions is not in conflict with that principle, e.g., the F-Gas Regulation should not conflict with the aims of the mentioned-above pieces of relevant EU legislations.

To reach the EU climate targets, we need ever more energy efficient products, but that will not be enough. New and more advanced technology also needs to be deployed on a large scale instead of conventional

technology, e.g., heat pumps are needed to heat buildings and water, instead of conventional heating systems relying on combustion of oil, gas, or direct heating from electricity.

When the F-Gas Regulation would be revised, it needs to be ensured that such essential new and more advanced technology does not become restricted, or unavailable, because of its technical requirements.

1.3 Relevance

- *(…) As regards HFC emissions, despite large emission reductions especially in the refrigeration sector, they still contribute to 2.5% to the EU's total GHG emissions in 2018 and continued supply and use of F- gases will continue to result in a 'bank' of potential emissions for the future.*

We would like to highlight that the underlined-part above and concluding statement is wrong, as the 2.5% contribution to the EU's total GHG emissions in 2018 **represent all f-gases emissions, including PFCs, SF6, etc., and not only HFCs**. Hence, we would recommend cross-checking the data with Eurostat, for instance, and further update the statement with the factual findings.

1.4 Coherence

- *(…) The Montreal Protocol's requirement to have export and import licences for HFCs is fulfilled by requiring registration in EU F-gas Portal and Licensing System before undertaking such activities. However, border controls using this licensing system can be made more effective if full advantage of the upcoming "EU Single Window environment for Customs" is taken.*

Fighting illegal trade of HFCs should also remain high on the Commission's agenda, as this latter would undoubtedly improve competitiveness of companies that comply with EU rules versus others. As such, we support and strongly recommend more market surveillance by customs authorities on illegal trade of HFCs, and further consider and address this issue in the future review of the Regulation in cooperation with Member States, i.e. by further integrating the EU F-Gas registry and the EU Single Window environment for Customs.

We greatly support the above-underlined statement and proposal from the Commission, as found in the Briefing paper.

- *(…) As for internal coherence, the Regulation has generally been found to be consistent and coherent internally and across its implementing acts. There are, however, some areas which require further amendments, including clarification of certain existing definitions and the inclusion of additional definition for e.g. certain categories of equipment, consistency of thresholds for the import of pre-charged equipment, and other issues and clarifications related to individual provisions.*

On the "internal coherence" findings, we would like to emphasise that the **Implementing Regulation 1191/2014 is still in conflict with Article 15(2)(c) of the F-Gas Regulation**. Therefore, we believe that the Regulation is neither fully clear, nor fully consistent.

Indeed, some APPLiA member companies are experiencing negative impacts regarding the current interpretation of such Article, as they are losing quotas to cover f-gases contained in pre-charged equipment which will be exported out of the Union. Consequently, they are facing a shortage of quotas to be used on the EU market and a decrease of competitiveness of EU-manufacturers of pre-charged

equipment exported outside of the Union (HFCs charged therein are accounted for within the quota system) as opposed to non- EU manufacturers (who do not have such obligation).

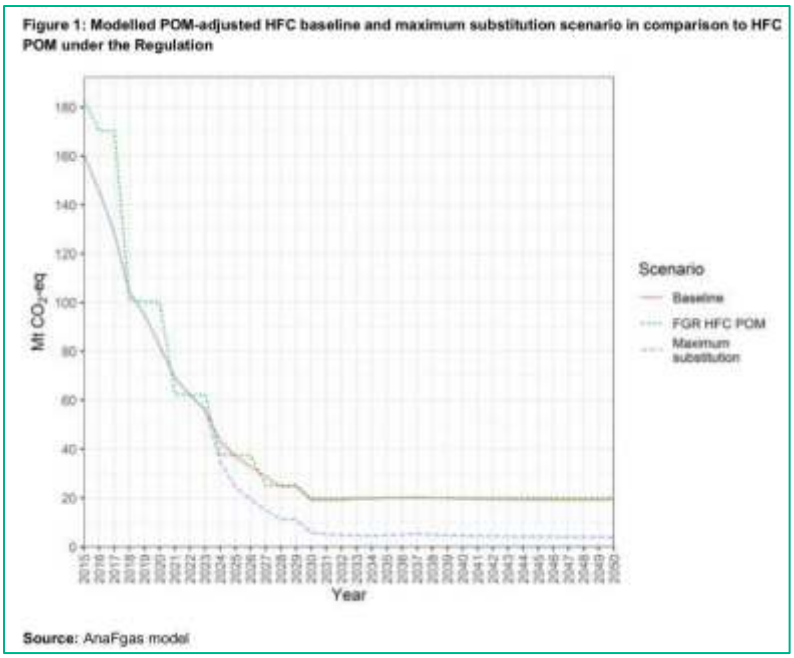
To respect the principle of proportionality and not be discriminatory, HFCs contained in pre-charged equipment exported out of the Union should not be included in the quota system.

4.2 Review of the Regulation – Objectives and envisaged policy options

Impact assessment of envisaged policy options (preliminary results)

2.1 Modelling of fluorinated GHG in the EU

A) Placing on the market of HFCs (POM)

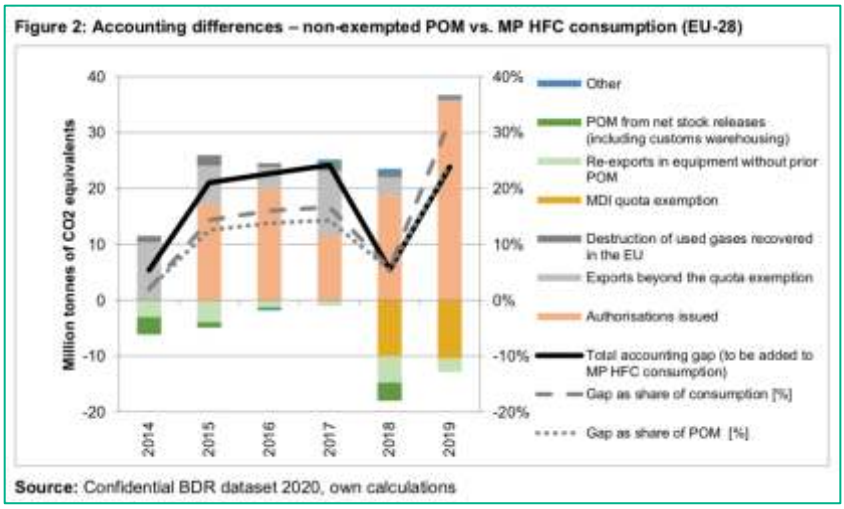


Regarding Figure 1, the "maximum scenario" is a non-realistic one, a theoretical scenario as based on Table 10 of the Briefing paper. Indeed, it only looks at a GWP value, without considering limitations of all types. Therefore, we have strong concerns how policy options can be proposed based on a 'non' realistic scenario. Also, some of the policy options envisaged as well throughout the Briefing paper are not feasible, as well as their envisaged timeline for implementation. The Figure also shows that, even by implementing the maximum substitution scenario (i.e. complete phase out of HFCs), there would still be remaining emissions of HFCs by 2050.

APPLiA and its member-companies would be keen on **receiving further backup information, which would better explain Figure 1** of the Briefing paper, e.g. list of data used, graph equations, etc.

B) Consumption of HFCs

Regarding Figure 2 herein below, we would be keen on **receiving further graphs showing the so-called "low-consumption" and "high consumption" scenarios**, as mentioned in the Briefing paper. Indeed, if not shown in Figure 2, it would be interesting to acknowledge these two scenarios as well. Also, it would be important to **receive all the background data** which supported the calculation to develop Figure 2.



Moreover, we believe that it is important to understand what kind of calculation has been undertaken to arrive to such a Figure and trends.

For instance, for the year 2019, we would like to remind that the "MDI" sector is not covered by the quota-system under the EU F-Gas Regulation, however, it is covered by the Montreal Protocol (MP). The "re-exports in equipment prior POM" would also be covered by the MP, but not by the EU F-Gas Regulation. In contrast, the "authorisations issued" category would be covered by the EU F-Gas Regulation, but not by the MP. Also, the "destruction of used gases recovered in the EU" category would be able to be deducted from the MP, but it is under the EU F-Gas Regulation. **We would like to understand how the trend lines (i) total accounting gap, (ii) gap as share of consumption, and (iii) gap as share of POM, were calculated** and translated into the Figure, as this latter would further corroborate, or the opposite, the next statement from the Briefing paper:

In 2019, EU-28 quota-relevant POM under the Regulation was about 24 Mt CO2 equivalents or 32 % above HFC consumption accounted under the MP. However, the size of these accounting differences has been varying strongly and is subject to several independent parameters and their trends (Figure 2). For a full comparison of the metrics, please refer to Annex 4 of the 2020 EEA F-gas Report.

We would like to emphasise on that the main message as underlined above, and as found in the Briefing paper, is **misleading and does not reflect the main finding of the EEA report from 2019** which states that "(…) *As a result, for 2019, the first compliance year of the HFC phase-down under the MP, the HFC consumption of the EU-28 amounts to only 45% of the permitted amount*"[6].

[6] EEA 2019 report, pages 32-33. Online source here.

The main message behind Figure 2, i.e. it is not automatically guaranteed that the current phase-down of the F-Gas regulation would comply with the latest steps of the MP HFC consumption, is correct. This latter compliance would depend on factors such as "destruction of f-gases recovered in the EU" and/or the "MDI" categories, etc., as seen in such Figure. In any case, we still have enough time, i.e. 10 years at least, to evaluate how the EU is evolving under the MP HFC consumption and react (if necessary) in an appropriate manner.

C) Demand and emissions of all modelled F-gases in the EU-27

Regarding **Figure 3, we would be keen on receiving more data** on how the Figure and the conclusion of the Figure, i.e. the F-Gas Regulation in its current form seems to fall short, have been developed.

For the time being, it is not very transparent to us on how the Consultant and/or competent authorities have reached such a conclusion.

Would it also be possible to understand whether there is a missing Figure in the Briefing paper which would reflect the situation for the EU-28, or not, i.e. what is the exact scope of Figure 3, what is the forecast value that we would need to take into account, and 'where' does the next statement of the Briefing paper would 'fit' in such a provided Figure:

For comparison, the impact assessment for the current Regulation projected a 60 % reduction in emissions in 2030, based on the emission level in 2005, for the EU-28. Given that the EEA now reports emissions in 2005 for the EU-28 with 94 Mt CO2 equivalents, the target for 2030 is approximately 38 Mt CO2 equivalents, while forecasted emissions for the EU-28 in the baseline scenario is 48 Mt CO2 equivalents.

Regarding **Figure 4, we would highlight the next important questions**:

- In general, the different categories provided in Figure 4 and Table 10 are not clear and incomplete, i.e. how is "heat pump" considered: for what application? which capacity? and what type for heating, e.g. hydronic, air-to-air, etc.? How is "stationary AC" interpreted? Does it mean merging stationary air-conditioning equipment and stationary heat pumps while the current regulation UE N° 517/2014 (see Annex III) defines clear prohibitions for placing on the market depending on the category of equipment?
- How is the "refrigeration" category understood? We would like the Consultant to clarify the different categories' definitions of Figure 4.
- How does the Consultant consider the positive contribution of heat pump technology to decarbonisation?

2.2 Environment impacts

On **Table 4, we would like to receive more data** from the Consultant on how they reached such numbers. Between "small" and "large" split heat pumps categories, we would like to understand **how to discriminate equipment** between one or the other? Power limit of 12kW? Use of hydrocarbons? Other?

2.3 Economic impacts

APPLiA would like to express that **without any cost projection, we are not in a position to provide comments and further information** on this section. As such, we would be keen on receiving more tangible information on foreseen cost impacts.

APPLiA and its members would like to thank the competent authorities for their consideration and further feedback regarding our recommendations, as well as on the several questions we have raised throughout this position paper.

We remain at your disposal to discuss the points we have raised above. Please do not hesitate to contact us via email: lara.carrier@applia-europe.eu.

APPLiA - Home Appliance Europe represents home appliance manufacturers from across Europe. By promoting innovative, sustainable policies and solutions for EU homes, APPLiA has helped build the sector into an economic powerhouse, with an annual turnover of EUR 50 billion, investing over EUR 1.4 billion in R&D activities and creating nearly 1 million jobs.