

Annex 1 to the Report of the Technology and Economic Assessment Panel

March 2018 Volume 1

TEAP Decision XXIX/9 Working Group Report on Hydrochlorofluorocarbons and Decision XXVII/5

Submissions by parties in response to decision XXIX/9 on hydrochlorofluorocarbons (HCFCs) and decision XXVII/5

Compilation of extracts containing substantive information

Armenia

Decision XXIX/9: Hydrochlorofluorocarbons and decision XXVII/5

Currently, according to Armenia's commitments the estimated amounts of HCFC after 2020 will not be exceeding 42 MT per year. According to expert assessment, a decline tendency of HCFC consumption could be observed not reaching the yearly allocated country quota. The NOU Armenia will be pleased to additionally provide you with more specific expert estimations as soon as they become available.

Azerbaijan

Information on Hydrochlorofluorocarbons for the period from 2020-2030:

0,05-0,08 ODP tonnes consumption, 99,5% decrease up to the 2020

"0" consumption, 100% decrease in 2030.

Canada

In response to *decision XXIX/9: Hydrofluorocarbons* and as a follow up to Canada's previous submission dated April 28, 2016 relating to the continued need for HCFCs after the phase-out date of 2020, Canada continues to require small quantities of HCFCs for Laboratory and Analytical Standard use. We previously reported that a quantity 0.8217 ODP kg was imported for L&A use in 2015. In 2016, Canada imported 38.8 ODP mg.

Again, although this quantity is very small it is envisaged that this use will be essential post-2020, particularly as a means to calibrate enforcement tools used to identify concentrations and types of HCFCs in bulk shipments and products.

Costa Rica

(Translation from Spanish)

In our case no special request has been received in this regard, and we believe that a consultation on this issue could generate some expectation that does not necessarily coincide with the objectives raised in our phase-out plan.

From our point of view and taking into account the level of reduction achieved to date with respect to the baseline, we would think that an additional quota will not be required to the one already agreed in the initial plan. However, with the information available at this time, we would not guarantee it 100%.

Japan

We have discovered that syringe/needle coating use is acknowledged for HCFC-225 in Japan and will continue further review on it as well as the other possible niche uses. Any further information will be submitted as applicable.

Kazakhstan

With regard to the provision of information (report) on the areas and volumes of possible HCFC demand for the period from 2020 to 2030, we report the following.

As you are aware, at the 29th Conference of the Parties to the Montreal Protocol on Kazakhstan, it was decided to approve a revised plan of action to return to compliance with measures to control HCFCs to a level not exceeding:

- (a) 7.5 ODP-tonnes in 2017, 2018 and 2019;
- (b) 6.0 ODP-tonnes in 2020;
- (c) 3.95 ODP-tonnes in 2021;
- (d) 0.5 ODP-tonnes in 2022, 2023 and 2024;
- (e) Tonnes of zero ODP by 1 January 2025, except for consumption limited to servicing refrigeration and air-conditioning equipment between 2020 and 2030, as provided for by the Protocol;

At present, jointly with UNDP, the work on the preparation and writing of a project to eliminate hydrochlorofluorocarbons, which has been approved by the GEF will begin. Within the framework of this project, the work will be carried out to identify the needs of HCFCs and their application areas after 2025. In this regard, unfortunately, at the moment we cannot provide the information requested in decision XXIX/9: Hydrochlorofluorocarbons and decision XXVII/5.

Mexico

(Translation from Spanish)

The annex includes information relative to the consumption of HCFCs that are considered within the basic domestic needs of Mexico for the period 2018-2030, for evaluation by the technical and Economic Assessment Panel (TEAP).

ANNEX A

Decision XXIX/9 – Mexico’s HCFC needs for the period 2018 to 2030

Quantities in Metric tonnes

Substance	Year												
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
HCFC-22	2,130.03	2,130.03	2,130.03	2,130.03	2,130.03	2,130.03	2,130.03	2,130.03	0	0	0	0	0
HCFC-123	59.27	59.27	59.27	59.27	59.27	59.27	59.27	59.27	59.27	59.27	59.27	59.27	59.27
HCFC-124	14.08	14.08	14.08	14.08	14.08	0	0	0	0	0	0	0	0
HCFC-141b	1,559.31	1,559.31	1,559.31	0	0	0	0	0	0	0	0	0	0
HCFC-142b	156.4	156.4	156.4	156.4	0	0	0	0	0	0	0	0	0

Palau

In regards to Decision XXIX/9 and XXVII/5, Palau wishes to submit the following:

- (1) The recent HFC alternative survey conducted by our office, determined that HCFC is neither used in the firefighting sector or as a cleaning agent and is mainly used for servicing in the refrigeration sector.
- (2) Palau has two firefighting departments, the airport station and the main station, and they are both using mostly water and some non-ozone depleting substances as an agent for foam and cleaning applications.
- (3) The Belau National Hospital under the Ministry of Health and other private hospitals are complying with the EQPB Ozone Regulations and only importing MDIs using HFC 134a as propellant.
- (4) Palau, unfortunately does not have any destruction facility for ODSs, and has stockpiles of recovered CFC and HCFC, which are contaminated and can't be reused.

Palau is in line with its HCFC phase-out timeline and will ensure its compliance with the mandate of the Montreal Protocol but requests assistance with the destruction of the recovered ODSs.

Venezuela (Bolivarian Republic of)

(Translation from Spanish)

To date, no extraordinary demand for HCFCs has been detected; on the contrary, sales have fallen largely as a result of an increase in consumption of HFCs and its mixtures. However, work is under way to promote the use of propane to replace HCFC-22 in low-load applications (mainly domestic), which has proven safe for use. It should be noted that current national regulations allow for an increase in national production or imports if there is an urgent demand that has not been met.

An Interested Entity: 3M

Background

Please consider this background for added context on 3M's perspective regarding the phase-out of HCFCs and the phase-down of HFCs. 3M has never been a manufacturer of HCFCs or HFCs. Also, 3M does not sell into large commodity sectors such as refrigeration and air conditioning. For the last 23 years 3M has been investing in technology to replace CFCs, HCFCs, HFCs, PFCs, and SF₆ in a wide variety of applications such as solvent, fire suppression, heat transfer, magnesium inerting and electrical switch gear. We have been investing on the assumption that HCFC and HFC policy and regulation would, in large part, be based on the availability of substitutes with lower overall environmental impact within a given sector and with the understanding that HCFC use would be restricted by 2020.

I also want to respond to the suggestion from other stakeholders that the fire suppression sector is small and continued use of HCFCs is necessary due to unique safety considerations. Any given sector in which HCFCs and HFCs are used, taken by itself, could be considered small. Policy and regulatory decisions addressing substitution for HCFCs and HFCs should be consistent and independent of the size of the sector. 3M has also observed that HCFC and HFC manufacturers are strong proponents for HCFC and HFC replacement in sectors where they have alternatives but not so much in sectors where others have made investments in alternatives. If it were true that the sectors being evaluated are small and inconsequential, 3M would not have invested in developing substitute technology and other stakeholders would not be so strongly advocating for continued exemptions.

With regard to performance and safety, I would like to emphasize that the fire suppression market is governed by industry standards, third party approval bodies such as UL and ISO and the U.S. EPA

SNAP Program. 3M™ Novec™ 1230 Fire Protection Fluid has been reviewed and approved by the U.S. EPA SNAP program for use in both total flooding and streaming fire suppression applications and, in the following discussion, I will address where third party approval testing has taken place to attest to the performance of Novec 1230 or other substitutes to replace HCFCs in a given fire suppression application. Where alternatives have been reviewed and approved by these third parties, safety is not compromised by substituting HCFCs with the approved substitutes.

Three separate applications are addressed below and appropriate documentation has been attached.

1. Replacement of halon and HCFCs in 150# wheeled units

Please refer to the attached documentation that addresses the use and approval of Novec 1230 fluid in wheeled units to replace both halon 1211 and HCFCs. The documentation includes the U.S. Airforce approval, the Amerex unit UL approval and a U.S. AF news article on their halon 1211 replacement effort. For additional background please consider that, based on EU regulation, the U.S. Air Force was compelled to decommission halon 1211 wheeled units on Air Force bases across the EU. Rather than choosing replacement units based on HCFCs, the U.S. AF chose units based on Novec 1230 fluid. For emphasis, the units based on Novec 1230 fluid are safe for electronics and safe for the firefighters handling these units. Also, there is no weight penalty for use of Novec 1230 fluid.

With regard to other HCFC replacement technologies for this application, please consider that many major commercial airlines don't use clean agent for this application but rather use dry powder fire extinguishers and accept the risk of destroying valuable equipment or the cost of repairing that equipment.

There does not appear to be any barriers to substitute for HCFCs in 150# wheeled units prior to 2020.

2. ARFF Vehicles

FAA testing of Novec 1230 fluid for use on Aviation Rescue Fire Fighting vehicles was completed in early 2017. The test protocol used for this testing was more demanding than the test protocol used for legacy agents such as halon 1211 and agent based on HCFCs. As a result, the approval for Novec 1230 fluid has been delayed until the FAA completes testing of legacy agents using the same test protocol. Although 3M believes the FAA testing illustrated there are no technical or performance barriers associated with transition away from HCFCs in this application, we need to wait on the FAA to report its findings.

The FAA testing was conducted with existing hardware. That is, pending the FAA report, Novec 1230 fluid will be a drop-in replacement for HCFCs used in this application. Major OEMs for these emergency vehicles have been engaged with 3M for a couple of years on this effort. Pending final approval of the FAA report, there does not appear to be any barrier to transitioning this application away from HCFCs prior to 2020. We also emphasized that, like the HCFCs used in this application, Novec 1230 fluid is a clean agent that does not harm valued electronics and there is no weight penalty for use of Novec 1230 in this application. 3M will continue to work with FAA to complete the final report prior to March 1, 2018.

3. Handheld portables

Although 3M is aware of testing that has been completed to demonstrate technical efficacy of Novec 1230 fluid as a replacement for HFCs and HCFCs in most handheld portable applications, commercial units using Novec 1230 fluid are not yet available. For larger sized handheld units, testing to date indicates a weight penalty for these units and additional testing may be necessary to reduce the size of those larger units. On this basis 3M has not been

active in the handheld portable market and can't speak in depth to the availability of other alternatives to HCFCs in the handheld market.

Attached documentation:

[14 nov a613087 USAF report Amerex 775 unit testing.pdf](#)

[Amerex Wheeled Unit EX5035-20141013-CertificateofCompliance.pdf](#)

[ARFFWG NOVEC1230 Article.pdf](#)