CONTENT

Overlap Kyoto / Montreal Current Phase

Refrigerators

Montreal Protocol's Multilateral Fund (MLF) has funded 11 HPMPs for refrigerator PUR blowing agent HCFC-141b. Among these, enterprises in 9 countries switched to Cyclopentane: Argentina, Colombia, Algeria, Morocco, Iran, Pakistan, Sudan, Sri Lanka and Bangladesh.
In Mexico, MABE moved to Hydroolefins (HFO).
The Indian HPMP moved to a 25%/75% mix of Cyclopentane and HFC-245fa.

Most Cyclopentane suppliers are petrochemical companies and no refrigerator or compressor company attempted to supply or brand their own. All PUR injection machinery suppliers offer HCFC-141b and Cyclopentane equipment.

No new blowing agent has appeared and Hydroolefins remain too expensive.

Time pressure is increasing with the 2020 deadline for 30% HCFC reduction approaching.

Many more countries will have to replace HCFC-141b, less than a third of them in refrigerator production. Other HCFC-141b use, like PUR for XPS insulation foam, panels, boardstock are more difficult than "appliance foam".

A ban on HCFC-141b has been legislated in Turkey, Thailand, Philippines, South Africa, Peru and Saudi Arabia, to assure that MLF ineligible enterprises also stop HCFC-141b usage.

In the US, EPA's 2016 SNAP rules HFC unacceptable for blowing agent from 2020 on, and national emissions trading under CAR and ACR credits blowing agent replacements of HFCs to HFO.

= no substitute for appliance blowing agents is a Kyoto gas, only in India
= no impact of MLF HPMPs on competition between refrigerator manufacturers or competition between manufacturing equipment suppliers
= no HCFC gas among refrigerator refrigerants and so MLF gets to this only after the HFC amendment is agreed.

At present, a Blowing Agent SB can add incentive to remove HCFC-141b if the criteria of EB34 para 17 are modified. A Blowing Agent SB also adds incentive to avoid switching to HFCs like in India. There are also many refrigerator manufacturers using HFCs that anticipate a Montreal amendment and this anticipation might help usage of a Blowing Agent SB or hinder it when the manufacturer hopes for more generous funds from MLF.

Airconditioners

Montreal Protocol's Multilateral Fund (MLF) has created 294 HPMPs in 144 countries where Airconditioner HCFC-22 consumption is reduced.

Competition between AC manufacturers is affected, more from the price of compressors than from the price of the refrigerant. Some manufacturers opt out of MLF funding offered by the respective government because they anticipate negative impacts for their marketing and instead replace HCFC-22 with a substitute of their own choice.

Most AC manufacturers opt for R410 although its GWP is higher than HCFC-22 (2100 for R410 and 1800 for HCFC-22).
Chinese AC manufacturers have already changed 6.5mio annual AC production to propane (10% of total), guided by the Chinese manufacturers association, CHEAA.
In India, a manufacturer was the first to introduce propane AC and sold several 100,000 refrigeratorss, supported by its maintenance network.
In Japan, Daikin promotes switching to HFC-32 in several countries, giving its 93 patents for free, and in Thailand, Algeria and Indonesia using funding from the MLF.

Around 15 new refrigerants are being tested and their benefit in "High-Ambient Temperature" HAT countries is uncertain. All are mixes that include HFCs combined with HFOs and Hydrocarbons to reduce the GWP to between 500 and 700.

HFO as AC refrigerant are not yet commercialised. The Hydrocarbon of choice for AC is propane (R290) and because of its flammability, new safety legislation is required and new skills for maintenance.

= Current "stage 1 HPMPs" have encountered problems in some countries and Airconditioners will remain a complex area for the Montreal Protocol's MLF.
= HCFC-22 substitution is shaped by resistance to HFOs and to HFC-32 because of commercial alliances. Daikin has become largest selling brand in 2014 and shapes the HFC-32 AC supply chain.
= Chinese manufacturers are positioned to gain market share where new safety regulations permit propane as refrigerant.
= market shares of AC with HFC refrigerants are steadily increasing

An AC refrigerant SB incentivises HFC-32 and propane at the expense of the dominant R410. Given the slow progress of both, this potential is large. With the need for new legislation for propane AC, an AC refrigerant SB would be used at first for HFC-32.

Kyoto Protocol and UNFCCC Regulations for Refrigerants

EB34 studied the following situation for chillers in methodology AM60:

Baseline	Project and Leakage
only CFC	HCFC-22, HCFC-123, HFC-134a, CO_2

to resolve the problem which gas counts as leakage, EB34 decided

a - all emissions of gases under the Convention but not in KP shall be considered
b - leakage of non-KP gases considered only when there is an increase
c - the GWPs from Third Assessment apply

The gases and the incentives for any PP back in 2007 do not exist any more in any country. Besides the changes in baseline and project scenarios since 2007 that render EB 34 para17 useless, the only achievement of EB 34 para17 has been to cause AM60 to become unusable, hardly a positive feature.
EB 34 para17 cannot be meaningfully applied to refrigerators or air conditioners because:

- the only possible baseline gases are never CFC
- the project and leakage gases are different
- Montreal Protocol now funds HCFC-22 phase-out with contradictory results because some countries opt for R410, others HFC-32 and others Hydrocarbons
- Montreal Protocol will fund all HFCs,
- the HCFC-22 funding and the Kigali Amendment have recently accelerated the development of several new refrigerants and refrigerant mixtures

EB 34 para17b is not and was never operable for refrigerators or air conditioners, because leakage for chillers is of a different order of magnitude. An increase in

leakage does not occur in refrigerators as many are hermetic or close to hermetic, and in air conditioners the leakage is more dependent on the quality of maintenance.

Can a realistic refrigerant leakage Tool address the following issues:

Refrigerators		
Baseline refrigerant	Project refrigerant	Leakage
Convention gases: Isobutane (HC600a)	Convention gases: Isobutane possibly HFOs	Convention gases: only for refrigerators that are not hermetic
Kyoto gases: HFC-134a	Kyoto gases: -	Kyoto gas: only if baseline is HFC-134a
In Europe and Japan 100% of refrigerators use Isobutane, elsewhere Isobutane market share steadily increases and no competitor for Isobutene is currently pursued anywhere. There is no price differential between Isobutane and HFC-134a using refrigerators and there is no efficiency difference. There are no countries any more where regulations prevent Isobutane because for household size refrigerators the Isobutane charge is below flammability concern levels. Isobutane is supplied by Bayer, Chevron, ExxonMobil, Jinling Petrochemical.		

To use EB34 para17b for household refrigerators, it would be necessary to determine

- whether leakage of Isobutane is higher or lower than the baseline refrigerators. That can be determined only if there is manufacturer data for the specific baseline refrigerator and the specific project refrigerator. Monitoring of household refrigerator leakage is unrealistic.
- what the leakage of HFC-134a was when the baseline refrigerator is certainly an HFC-134a containing refrigerator, also only with manufacturer's data.
- whether all project refrigerators have been tested by automatic leak detection with inert gas test equipment (halogen or helium) at the end of manufacturing. This can be guaranteed by major manufacturers but not smaller ones, both for Isobutane and for HFC-134a. For Isobutane leak testing, many manufacturers also use a tightness test with 10 bar Nitrogen or air and in this case leakage of Isobutane is effectively zero.

These three questions can be answered, however, in neither case does EB 34 para17 have any impact in practice. Because when baseline and project refrigerators use Isobutane, there is no increase of Isobutane leakage of material significance. And when the baseline refrigerators use HFC-134a and all project refrigerator use Isobutane, there is always a reduction in leakage of the KP gas (credited), however EB 34 para17b implies that the non-KP gas Isobutane increases as there was none in the baseline refrigerator despite the miniscule quantity.

A. baseline 1 KP-gas and 1 non-KP-gas, project 1 non-KP-gas = EB34 scenarios incorrect

Using the IPCC GPG 2006 Table 3.22 for domestic refrigerator with 0.1-0.5% provides only a formal assumption because there is no increase of Isobutane leakage, when applying say 0.3% for baseline and for project refrigerators with Isobutane there is not difference and when baseline is HFC-134a and project case Isobutane there is a reduction in KP gas leakage and an increase in non-KP leakage.

Therefore, EB 34 para17 does not make any sense for household refrigerators, aside of the practical difficulty of ascertaining whether the baseline and project refrigerators come from manufacturing lines with automatic leak testing and to get manufacturer leakage data when there is no automatic leak testing. Or to get reliable data on the re-filling of Isobutane refrigerators.

B. EB34 para17b requires manufacturer data that is possible but in a considerable number of cases not available.

C. The non-KP-gas Isobutane does not have an IPCC GWP value and published assumptions range from 2 to 20, often by just lumping it into "volatile hydrocarbons". For this reason some Environmental Impact Studies use the stochiometric amount of CO2 from an Isobutane molecule as an approximation of GWP.

All remarks so far concern a project case where baseline and project refrigerators are individually known, i.e. it is certain whether it is an HFC-134a to Isobutane switch or not. However this precondition excludes real world potential PP because household refrigerator project activity is some form of Demand-side Management (DSM) by utilities or governmental agencies. DSM-type project activities can pursue the refrigerant Standardised Baseline approach because it creates the variability of the baseline comprising all refrigerators and project refrigerators to be varied households. In other words, the DSM activity is not bound to be exclusively for HFC-134a refrigerators.

Adapting EB 34 para17 to refrigerators can postulate that Convention gases are not accounted for because this concerns only Isobutane.
This seems a rather obvious adaptation. There are no HCFC refrigerants in household refrigerators.
HFC-134a reduction or substitution is a KP-gas and a helpful adaptation of EB 34 para17 can introduce criteria for HFC-134a share among baseline refrigerators.

Can the Tool state that household refrigerators are exempted from EB34 para17a because there is just no Convention gas leakage ? There is no reason to treat Isobutane as if it is in any way comparable to HCFC. This rule fits under materiality in leakage, <0.5% is the possible leakage of Isobutane compared to HFC-134a leakage, and compared to 100kWh electricity savings, the Isobutane leakage is 0.1%.

If this is not possible to modify EB 34 para17, could it be feasible for the Tool to postulate that there is no leakage only the full charge is released at end of life, so ONLY for Isobutane:

$$BE = Qref \times GWP / 17 \text{ yrs}$$

The advantage of this rule would be that it eliminates all problems of determining leakage rates of Isobutane refrigerators and the share of refrigerators that come from production lines with automatic leak detection. Another possibility would be to establish a default for the share of Isobutane refrigerators that need to be refilled before end-of-life (perhaps 25% or so).

SREF is useful as base for DSM providing flexibility to the conditioners for participating households and enables additional policy instruments for substituting HFC-134a.

Air Conditioners

EB 34 para17 does not fit air conditioners because >80% or air conditioners contain HCFC-22 and therefore the baseline refrigerant is a non-KP gas and the project refrigerants are mostly KP gases.

Air conditioners		
Baseline refrigerant	Project refrigerant	Leakage
Convention gases: HCFC-22	Convention gases: Propane (HC290) HFO1234yf HCFC-22	Convention gases: Propane HFO1234yf HCFC-22
Kyoto gases: HFC-134a R410a	Kyoto gases: HFC-32 HFC-134a R410a	Kyoto gas: HFC-32 HFC-134a R410a
Montreal Protocol funds replacement of HCFC-22 in most countries to R410a (thereby increase GHG impact), in Thailand and Indonesia to HFC-32 and in China to propane. With the Kigali amendment there is a fast expanding range of other HFC mixtures and HFC-HFO mixtures being investigated for air conditioners.		

The problem of adaptation of EB 34 para17 to air conditioners is quite different than for refrigerators. HCFC-22 air conditioners continue to be produced and sold and so a PP might install greenfield air conditioners with HCFC-22. EB 34 para17b accounts for this, so it still has a purpose for air conditioners. However EB 34 para 17b states "if there is an increase of non-KP", so if the leakage of HCFC-22 is less than the leakage of CFC was in the baseline case, then the reduction is not credited (as both HCFC-22 and CFC are non-KP). But there are no CFC air conditioners anywhere and therefore EB 34 para17 implies again establishing whether the leakage of HCFC-22 in the baseline case was higher or not than HCFC-22 leakage in the project case. In practice this is extremely difficult because the leakage depends on maintenance quality and conditions for surveys on HCFC-22 refilling are unclear.
In countries with good RAC trade associations, it is possible to devise surveys using maintenance guidelines applied by such an association.

Survey data on the leakage of new refrigerants is possible because air conditioners are refilled every one or two years and therefore representative

data appears soon after a new refrigerant is introduced. Leakage data from manufacturers is probably too selective to use. The IPCC GPG 2006 Table 3.22 for household air conditioners gives 1 < x < 10%, that is a quite large range.

An Indian Propane air conditioner manufacturer claims that leakage of propane is less than 1/10th than leakage of HCFC-22. Of the first 100,000 such air conditioners sold, less than 500 had leaks in the first year. More data will appear as these air conditioners accumulate usage. Other published assumptions on Propane AC leakage contradict this.

Switch from	Switch to			
Convention gas	Convention gas	always reduction, so far only to propane	China, India, likely Brazil	para17 of some value to prevent project HCFC-22 AC with higher leakage
Kyoto gas	Convention gas	para17b imposes to monitor leakage even so GWP 5		para17 of some value to prevent project HCFC-22 AC with higher leakage but also adds monitoring burden for propane
Convention gas	Kyoto gas	majority of countries use Montreal funds to change to R410a	Japan, Indonesia, Thailand, Algeria	para17 wrong guidance because always higher project emissions
Kyoto gas	Kyoto gas			para17 not relevant

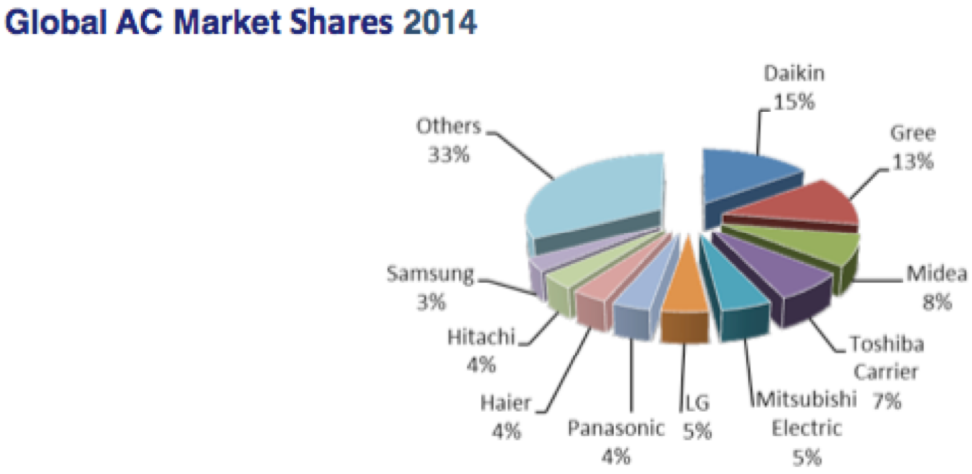
In sum EB 34 para17 is useful in contexts of switching to Convention gases, but it does not work against the "abuse" of Montreal funds in the majority of countries because it doesn't credit the HCFC-22 reduction.

"Market leakage" can occur when manufacturers anticipate volume limits in HCFC and HFC. Manufacturers know that x years in the future the government has an obligation to reduce by y% and translate this into their production planning. Furthermore manufacturers gauge prospects of exporting and new government regulations in their export target countries. A buyer of an air conditioner can anticipate that he might not be able to purchase the refrigerant to refill his air conditioner.
"Activity leakage" is the typical emissions increase outside of the project boundary related to the project activity or leakage within the project boundary.

By far the most Non-Annex I countries use HCFC-22 only for servicing air conditioners. Manufacturing of air conditioners is concentrated in China and when accounting for all Japanese, US and Korean brands produced in China, China has a market share of around 80%. China's HCFC-22 Phaseout

Management Plan is therefore the main determinant of HCFC-22 replacement across the world.

Just to mention it, one can consider upstream emissions of refrigerants by accounting for the energy consumption in refrigerant production and HFC-134a is more energy intensive to produce than Isobutane (Ecodesign MEEUP 2005).



And SB needs to reflect how decisions in the sector are taken. The Grid EF has 2 aspects, power plants influence each other physically and investors are stuck with 100s mio for many years. Thus utilities are all scenario assessors and risk mgmt. Investment Analysis would work perfect if you know how utilities value their balance sheets. Cannot be avoided.

Refrigerants are another special case, very different from efficiency because efficiency is decided by the fridge buyer so efficiency is all about signaling labels to buyers. Refrigerants are the opposite, decisions are taken for groups of companies. Refrigerants is all about sheep herd behavior. Herd runs in this or another direction but it is always the herd.

In the innovation economics it is called the specialized supplier trajectory.

Montreal Protocol Kigali Amendment Outcomes

HFC baseline for most Art.5 countries average of 2020, 2021, 2022 + 65% HCFC
HFC Freeze year 2024

HFC baseline India, Iran, Iraq, Pakistan, S. Arabia, Kuwait, UAE 2024, 2025, 2026
HFC Freeze year 2028 + 65% HCFC

HFC consumption continues to increase for another 8 years and for a few countries for another 12 years.

HFC Phase-down schedule for most Art. 5 countries
2024-28: 100%, 2029-34: 90%, 2035-39: 70%, 2040-44: 50%

HFC Phase-down schedule India, Iraq, Pakistan, S.Arabia, Kuwait, UAE
2028-31: 100%, 2032-36: 90%, 2037-41: 80%, 2042-46: 70%

serious restrictions of HFC consumption only start in 20 years for most Art.5 countries and for a few only in 25 years. Only after 2050 will HFC consumption sink below 50%.

Comment 1: this is really slow. In addition, RAC is a global and oligopolistic market where Japan, Korea, China and US corporations set the technology pace and will replace HFC within the next four to five years. Most companies in Art.5 countries will replace HFC technology earlier not because of the phase-down but because only non-HFC equipment with better energy efficiency is on offer. Esp. the core of RAC technology, compressors, are oligopolistic and have large economies of scale. Danfoss, Embraco etc. now target R&D only to non-HFC compressors and the available HFC ones fall behind in efficiency soon. HFC-32 and thus household AC is the only exception[1].

Comment 2: the HFC phase-down starts in 2024, the year Art.5 HCFC consumption limits decline from 65 to 33% and in addition the HFC phase-down baseline includes two-thirds HCFC consumption. Many HCFC consumers can switch back-to-back to HFC until 2040. This adds more triple phase-outs and was not intended since 2024 was a just middle ground between proposals negotiated, probably a compromise outcome not anticipated by negotiators. HCFC to HFC switching is today occurring (HCFC-22 to R410a) in air conditioners[2], in 2024 it will concern HCFC-22 and HCFC-123 mostly in large chillers and industrial refrigeration (as HCFC-141b and HCFC-142b have already been funded and no other HCFC

[1] Commercial motivated technologically mislabeled inputs on HFO and HFC-32 were prominent during the MOP in Kigali.

[2] The Chinese Household Electrical Appliances Association has opted for Hydrocarbons in air conditioners and their global market share is the main factor at work.

remain). Chiller owners are enabled to choose drop-in HFC in projected 30,000 units in Art.5 countries, to avoid investing in new chillers.

Kigali Section B Article III: The Amendment shall have no effect on the status of HFC under the Kyoto Protocol and will not except HFC from Art. 4 and 12 under UNFCCC and Art. 2, 5, 7 and 10 of its Kyoto Protocol. Each party to this Amendment shall continue to apply the provisions of the UNFCCC and its Kyoto Protocol as long as those provisions, respectively, remain in force with respect to such party.

The Kigali Amendment increases the volume and incentives of HCFC to HFC switching in the next eight years. It adds a strong regulatory HCFC to HFC linkage on top of the technological HCFC to HFC linkages. This regulatory linkage has two elements, the inclusion of HCFC in the HFC baseline at 65% and the phase-out step of HCFC in 2024.

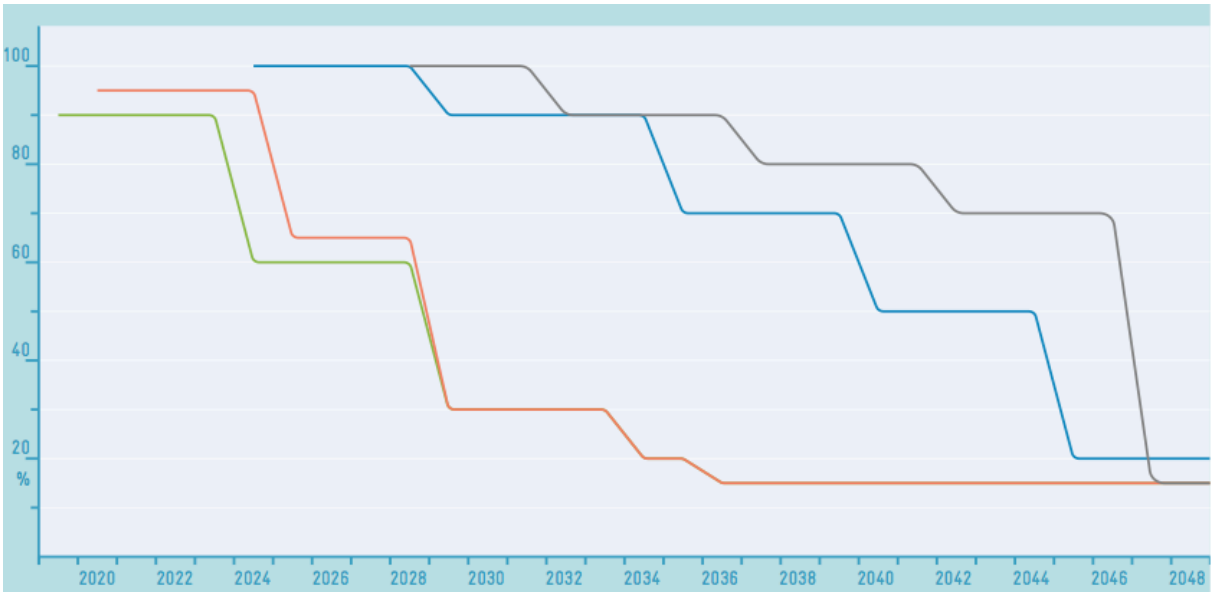
SBs for refrigerants and for blowing agents are applicable for the next 20 years and most HFC consumers decide whether to replace earlier or wait for MLF funding. The additionality of refrigerant and blowing agent SBs can apply the HFC phase-down schedules each country submits to the MLF. These schedules contain the impact of each government's use of Montreal funds. When a company replaces HFC or HCFC before the phase-out, the emission reduction can be credited until the phase-out schedule forces the substitution of HFC and HCFC.

The refrigerant SB approach suggested, calculating the specific refrigerant charge (tCO_2e/kW and tCO_2e/ltr) among all refrigerants entering a market accommodates the strengthened HCFC to HFC linkage and correctly incentivizes HFC replacement before 2024. For refrigerators, the refrigerant SB reflects the share of Iso-butane and HFC-134a since no other refrigerants are used. For air conditioners the refrigerant SB reflects HCFC-22, HFC-134a, R410a and Propane.

HFC refrigerant replacement projects for refrigerators and for air conditioners cannot be assessed with investment analysis because all manufacturers of refrigerators and air conditioners are making decisions about their competitive advantages in very fluid markets. When they opt for switching to Hydrocarbons or to HFOs, they anticipate future trends in compressors prices and compressor efficiencies since these are the key factors for their sales. Refrigerant and air conditioner users do not

consider the refrigerant type in their purchase decisions. All factors for additionality are upstream, component purchases by the refrigerator and air conditioner manufacturers.

Two criteria for additionality are objective and straightforward, in all CDM countries, there are manufacturers that are not eligible for Montreal HFC phase-out funds, and those manufacturers receiving Montreal funds are clearly known in advance when governments submit their phase-out plans to the Montreal Protocol's Multilateral Fund secretariat.



Article 2 countries **Russia, Belarus, Kazakhstan** **Article 5 countries**

India, Iran, Pakistan, Saudi Arabia, Bahrain, Kuwait, Qatar, UAE

Supply chains for air conditioners: Manufacturers

Importers

Wholesalers

Distributors

Shop owners

Contractors

End users

In few countries the chain is shortened by manufacturers owning shops and establishing contractors for installation, for example, by Gree with distribution shops across China. In other countries, importers are the key actors by delivering directly to shop owners. Importers and wholesalers depend on the availability of contractors for the installation of split type air conditioners but also for the maintenance of single unit room air conditioners.

The configuration of the supply chain in particular countries can influence the policies of choice for refrigerants. Some policies address refrigerants as an entire class, for example the EU's F-gases regulation which sets quotas for each of the HFC using companies in the EU (~400) and leaves the companies to decide on which HFC they want to use. At the opposite end the US SNAP regulation which sets use limits and dates for each particular HFC and each particular air conditioner type. Another unique

example is the state of California regulating the treatment of HFC containers for refilling car air conditioners.

COMMENTARY from Thomas Grammig

on

Official Evaluation of HPMPs for the Montreal Protocol

UNEP/OzL.Pro/ExCom/77/9
By Senior Monitoring and Evaluation Officer of the Multilateral Fund (MLF)

This evaluation has been elaborated during 2015 and 2016 and contains a carefully negotiated interpretation of the results and the underlying reasons. Among seven countries analysed three patterns have appeared:

China	most large AC manufacturers converted to propane, HC-290
Indonesia and Thailand	all AC manufacturers converted to HFC-32 but claim compressors are not available and they must still produce R-410a
Argentina, Lebanon, Jordan, Serbia	all AC manufacturers converted to R-410a

The evaluator's (very brave) choice of these seven countries underlines the need to explain these astounding patterns. Governments' deliberations with national industries have led to radically different conclusions and the MLF "duly" supports all three patterns.

The detailed evaluations on the seven countries remain confidential and in the public final report text, the central conclusions carefully negotiated are three:

- Enterprises should evaluate in detail the availability and/or limitation of equipment and quality refrigerants before deciding a course of action for conversion (para 10)
- Unfortunately, few enterprises, despite completing their conversion and developing prototypes for HFC-32 are instead manufacturing high-GWP based equipment. The reason being a lack of market

demand and the servicing sector's reluctance to deal with flammable refrigerants (para 12)
- In some countries incremental operating costs (IOC) was paid even if the enterprise is not manufacturing the agreed technology. This approach is not acceptable and IOC cannot be used otherwise than initially planned. (para 15)

These three core conclusions are incoherent in as far as they target enterprises' efforts while another evaluation insight is these governments chose to have all respective national enterprises opt for one solution. Supplies of refrigerants and compressors are global and all suppliers of refrigerants and of compressors are globally active corporations. The reasons for some countries opting for R-410a, others for HFC-32 and others for HC-290 are some reasons carefully and genuinely selected by governments making these choices.
Indonesia and Thailand encourage Japanese AC manufacturers to continue using their countries for Japanese AC manufacturing. The official evaluation text forcefully states Daikin and Panasonic ran "massive public advertising campaigns" for HFC-32 (para 55, so the evaluation underlines the actual forces at work). Perhaps it was the Indonesian and Thai governments that opted for a commercial economic strategy that the enterprises obey, or the respective industry associations determined it was the collective export strategy to go for HFC-32 with the governments following their choice. Likewise it might be the commercial economic strategy of the Chinese government to avoid the Japanese technology option, or it might be the Chinese AC association that decided to switch to propane, HC-290. Irrespective of more the government or rather the industry that decided, it is a national choice (the evaluation result that enterprises shall improve their decisions is not really applicable).

In the Thai case, it is revealing that the NAMA funded from UK and Germany (14 mio €) to switch AC manufacturing to propane (HC-290) as refrigerant and that two Thai companies later on decided to withdraw from the HPMP that Thailand submitted to the Montreal Protocol. There are 280 AC manufacturers in Thailand pursuing a variety of commercial strategies. Large Thai companies, Bitwise, UniAire, Eminent Aire and Unico, also claim problems with HFC-32 compressor supplies, as the public evaluation report again **revealingly admits**. So in Thailand more than elsewhere, the industry's decision for the next refrigerant is rather conflictive. Still the Thai HPMP targets them all, sort of a competition between Ministry of the Environment and Ministry of Industrial Works, one with NAMA funds the other with MLF funds.

The evaluation shows the regulations of HPMPs also serve diverse commercial strategy interests of global producers, despite large differences in environmental impact with GWP for R-410a of 2088, GWP for HFC-32 of 675 and GWP for HC-290 around 11. GHG impacts vary by a factor of 200. Finally, it is important to underline that by NOW spending

Montreal funds in HPMPs to introduce more HFC gases as refrigerants, the forthcoming Montreal funds for future Montreal Protocol Kigali Amendment projects is raised and inflated.
This official evaluation is really the MLF's controllers urgent appeal for more responsible use of the MLF funds – by naming some players but not stating the outcome. New regulations for HPMP stage III will emerge.

There are 143 HPMPs operating in Kyoto Protocol Non-Annex I countries and all comprise AC maintenance support to reduce refrigerant leakage. National choices of refrigerants have bigger impact than loosely related maintenance parts of HPMPs. The massive shift to R-410a can be reduced when the leakage GHG impact is accounted for in AC standardized baselines.