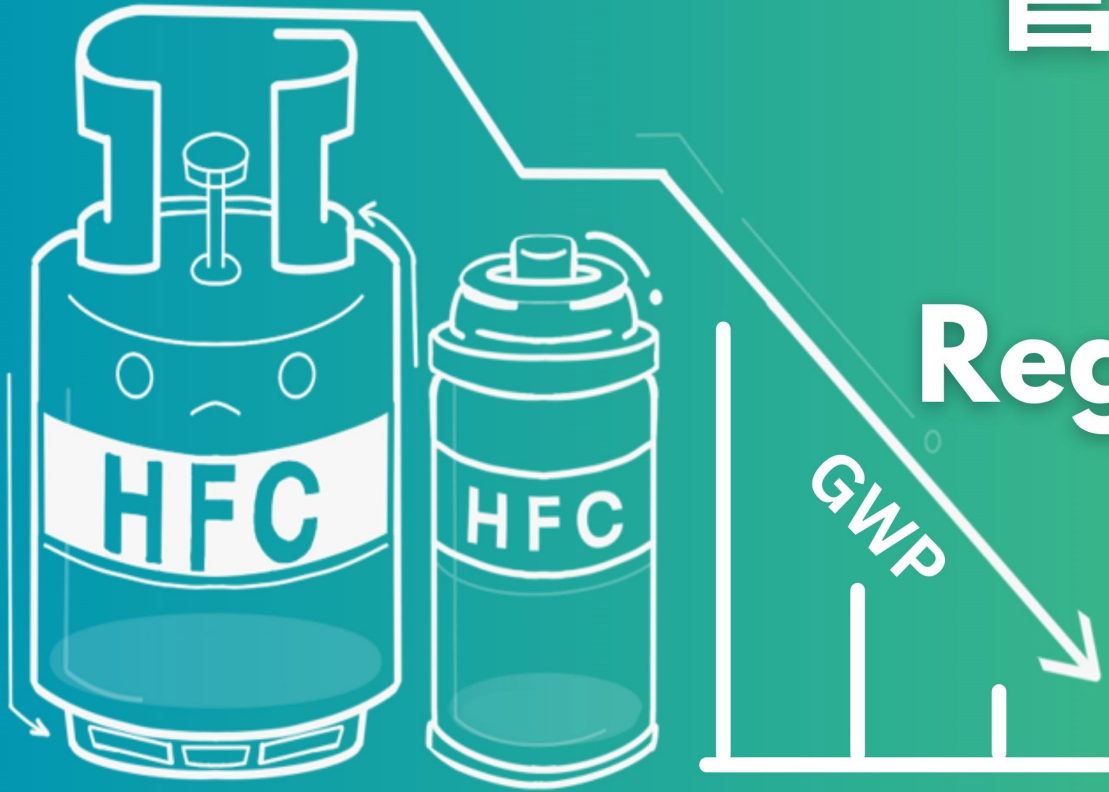


管制及削減氫氟碳化物 公眾諮詢

Regulate and Phase Down Hydrofluorocarbons Public Consultation



Environment and Ecology Bureau

The Government of the Hong Kong Special Administrative Region
of the People's Republic of China

2023年7月
July 2023

我們的建議

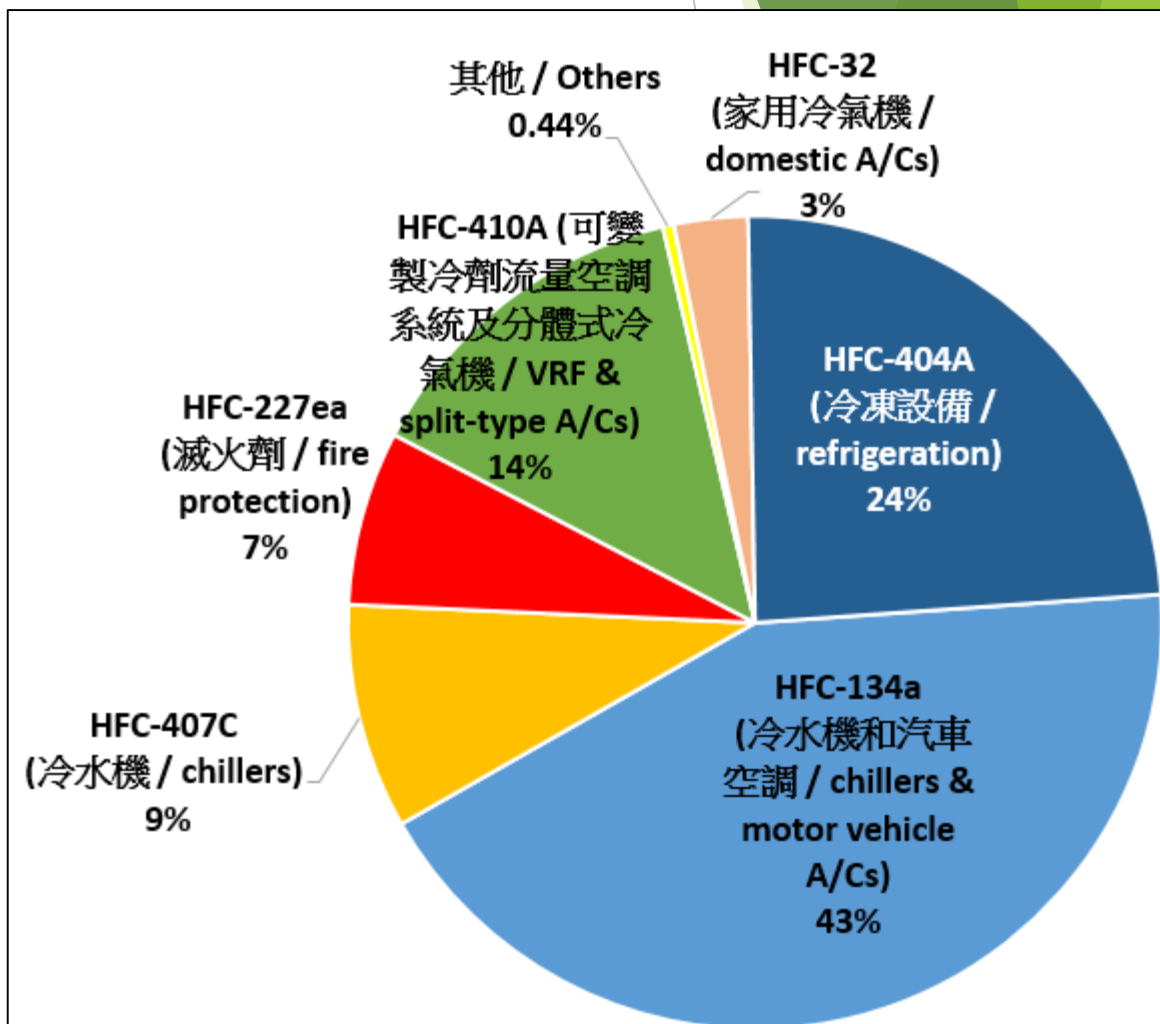
Our Proposals

1. 氫氟碳化物(HFC)的挑戰
Challenge of Hydrofluorocarbons (HFCs)
2. 我們對管制及削減HFCs的建議
Our Proposals to Regulate and Phasedown HFCs
3. 徵詢意見
Views Invited

氫氟碳化物(HFCs)

Hydrofluorocarbons (HFCs)

- ▶ 普遍用作取代CFC和HCFC製冷劑，以及哈龍滅火劑
Commonly used as substitutes for CFC and HCFC refrigerants as well as halon fire suppressants
- ▶ 強力的溫室氣體，擁有甚至於等同二氧化碳1萬4800倍的高全球升溫潛能值(GWP)
Powerful greenhouse gases with high global warming potential (GWP), up to 14,800 times that of carbon dioxide
- ▶ 於2022年的進口等同超過140萬公噸的二氧化碳當量 (或超過770公噸淨重)
Over 1400 kilotonnes CO₂-equivalent (or 770 metric tonnes in net weight) were imported for local use in 2022



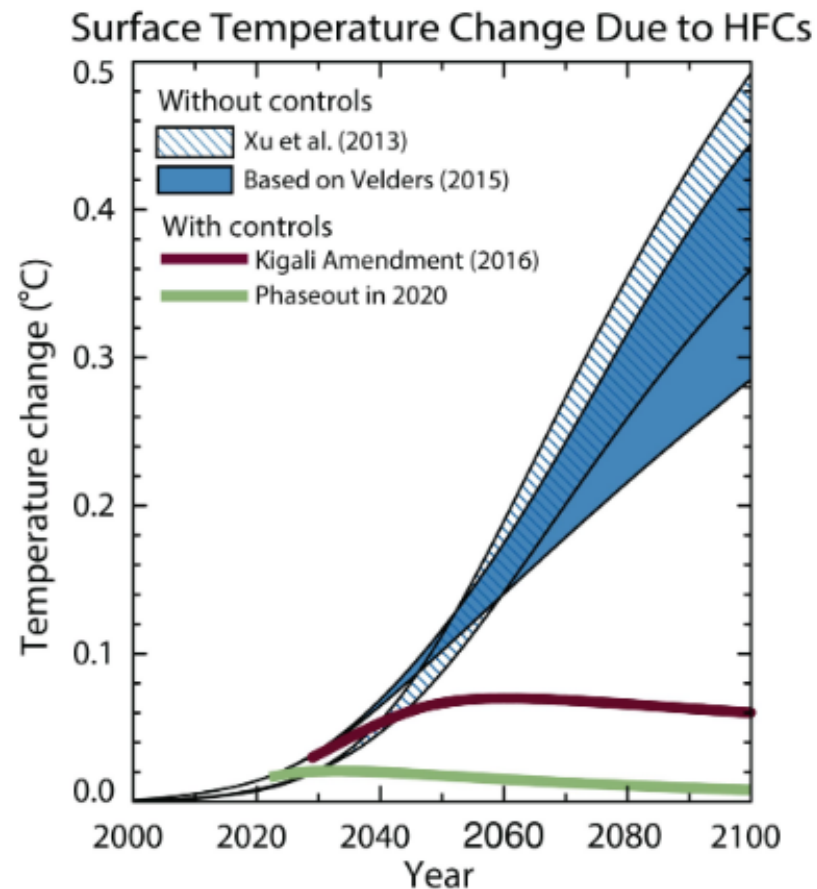
國際為削減HFC的努力 - 基加利修正案

International HFC Phasedown Efforts - Kigali Amendment

- 《〈關於消耗臭氧層物質的蒙特利爾議定書〉基加利修正案》將HFCs納入管制，要求締約方削減生產及使用

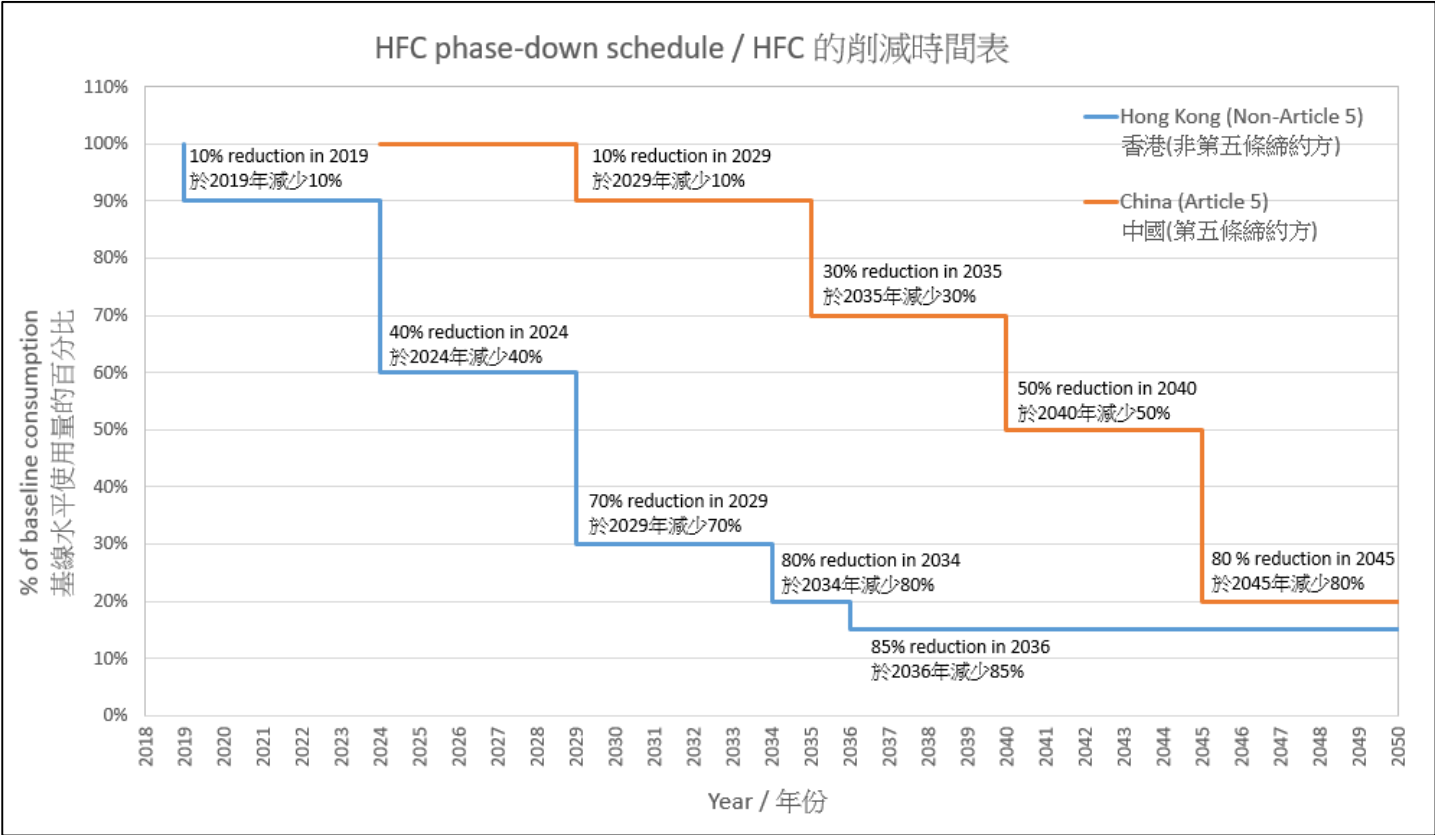
Kigali Amendment to the Montreal Protocol brings HFCs into control and requires Parties to phasedown their production and consumption

- 全球的削減將避免在本世紀末升溫攝氏0.5度
A global phasedown is expected to avoid up to 0.5 degree Celsius of global warming by end of this century
- 198個《蒙特利爾議定書》的締約方當中，有150個已批准 / 接受《基加利修正案》
150 out of 198 Montreal Protocol Parties have ratified / accepted the Kigali Amendment
- 中國於2021年6月接受《基加利修正案》
China accepted the Kigali Amendment in June 2021



基加利修正案 - HFC削減時間表

Kigali Amendment - Phasedown Schedule of HFC



HFCs 的年度生產量及使用量均以二氧化碳當量總量計算(即 HFCs 的公噸淨重乘以其 GWP)
Production and consumption of HFCs measured in total CO₂ equivalent (i.e., net weight in metric tonnes of HFCs multiplied by their GWP).
使用量是以該地方的生產量加上進口量再減出口量的方式計算
Consumption is defined as the production and import of HFCs into a given place, less the amount of export.

香港的削減時間表 Phasedown Schedule for Hong Kong	單位：千公噸二 氧化碳當量 Unit: kilotonnes CO ₂ -eq
HFC 基線 HFC baseline	1682
基線的 90% (2019-2023 年) 90% of baseline (2019-2023)	1513
基線的 60% (2024-2028 年) 60% of baseline (2024-2028)	1009
基線的 30% (2029-2033 年) 30% of baseline (2029-2033)	504
基線的 20% (2034-2035 年) 20% of baseline (2034-2035)	336
基線的 15% (2036 年及之後) 15% of baseline (2036 and thereafter)	252

基加利修正案 - 其他要求

Kigali Amendment - Other Requirements

- ▶ 為新的、已使用的、循環再用的和再生的HFCs實施進出口許可證制度
Implement a licensing system for import and export of new, used, recycled and reclaimed HFCs
- ▶ 向聯合國環境規劃署臭氧秘書處申報進出口及生產統計數據
Report the import, export and production statistics to the United Nations Environment Programme (UNEP)'s Ozone Secretariat
- ▶ 由 2033 年 1 月起，不得與非締約方就受管制HFCs進行交易
Not to trade the controlled HFCs with non-parties, effective from January 2033

HFC 替代品

HFC Alternatives

- ▶ 各種低 **GWP** 替代品已在全球市場供應

Large variety of low-GWP alternatives commercially available in the global market

- ▶ 天然製冷劑 (GWP接近零) Natural refrigerants (GWP close to zero)

- ▶ 碳氫化合物 Hydrocarbons

- ▶ 二氧化碳 Carbon dioxide

- ▶ 氨 Ammonia

- ▶ 其他 Others

- ▶ 氫氟烯烴 (GWP低於 10) HFOs (GWP less than 10)

- ▶ 轉用低**GWP**替代品有助全球應對氣候變化，亦可節省能源

Transition to low-GWP alternatives contribute to global efforts in combating climate change and bring upon energy savings

我們的建議

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我們對管制及削減HFCs的建議

Our Proposals to Regulate and Phasedown HFCs

管制策略1 Control Strategy 1

通過禁止生產和管制進出口，
以管制香港HFCs的整體生產
量及使用量

Control the overall production
and consumption of HFCs
through manufacture, import
and export control

管制策略2 Control Strategy 2

通過限制市場上高 GWP 產品
及設備的供應加速市場轉型

Accelerate the transition from
the use of high-GWP
product/equipment by
restricting the supply of these
product/equipment in the
market

管制策略3 Control Strategy 3

通過製冷劑回收再用和管理
計劃以推動製冷劑的回收和
循環再用

Drive refrigerant recycling
through refrigerant recycling
and management programme

法例修改的建議

Proposed Legislative Amendment

- ▶ 《保護臭氧層條例》（第403章）於1989年制定，管制消耗臭氧層物質的生產及進出口，保存消耗臭氧層物質的資源以實施《蒙特利爾議定書》的規定

The Ozone Layer Protection Ordinance (Cap.403) (OLPO) was enacted in 1989 to prohibit the manufacture, control the import and export, and conserve the resources of ozone-depleting substances for implementation of the requirements of the Montreal Protocol

- ▶ 我們會將《保護臭氧層條例》的管制範圍擴大至涵蓋HFCs，加入針對HFCs的管制要求

We will amend the OLPO to extend the control provisions of the OLPO to cover HFCs and set out the new regulatory requirements on HFCs

管制策略1 - 管制HFCs的整體生產量及使用量

Control Strategy 1 - Control the Overall Production and Consumption of HFCs

- ▶ 禁止**18種HFCs**的生產

Prohibit the manufacture of **18 HFCs**

- ▶ 引入HFCs的**出進口許可證和配額制度**

Introduce **licensing and quota control** on import and export of HFCs

- ▶ 散裝 HFCs，不論是單一物質或以混合物形式存在(例如由 HFC-32 與 HFC-125 混合而成的R-410A)都受管制

HFCs in bulk, whether existing alone or in a mixture, are covered (e.g. R410A, a blend of HFC-32 and HFC-125)

組別 Group	物質 Substance	100年全球升溫潛能值 100-Year Global Warming Potential
<i>組別 I Group I</i>		
CHF_2CHF_2	HFC-134	1,100
CH_2FCF_3	HFC-134a	1,430
CH_2FCHF_2	HFC-143	353
$\text{CHF}_2\text{CH}_2\text{CF}_3$	HFC-245fa	1,030
$\text{CF}_3\text{CH}_2\text{CF}_2\text{CH}_3$	HFC-365mfc	794
$\text{CF}_3\text{CHFCF}_3$	HFC-227ea	3,220
$\text{CH}_2\text{FCF}_2\text{CF}_3$	HFC-236cb	1,340
$\text{CHF}_2\text{CHFCF}_3$	HFC-236ea	1,370
$\text{CF}_3\text{CH}_2\text{CF}_3$	HFC-236fa	9,810
$\text{CH}_2\text{FCF}_2\text{CHF}_2$	HFC-245ca	693
$\text{CF}_3\text{CHFCHFCF}_2\text{CF}_3$	HFC-43-10mee	1,640
CH_2F_2	HFC-32	675
CHF_2CF_3	HFC-125	3,500
CH_3CF_3	HFC-143a	4,470
CH_3F	HFC-41	92
$\text{CH}_2\text{FCH}_2\text{F}$	HFC-152	53
CH_3CHF_2	HFC-152a	124
<i>組別 II Group II</i>		
CHF_3	HFC-23	14,800

管制策略1 - 管制HFCs的整體生產量及使用量

Control Strategy 1 - Control the Overall Production and Consumption of HFCs

▶ 禁止進口HFC-23

Introduce import ban for HFC-23

- ▶ 由於 HFC-23 的 GWP 極高和只用於少量的超低溫凍櫃及實驗室研究，禁止進口可減少其使用，把進口配額留給其他用途

HFC-23 has extremely high GWP and with only limited use in ultra-low temperature refrigeration system and laboratory research. Import ban could discourage its use and save the import quota to other applications.

- ▶ 建議容許每個申請人 **10 公斤** 的豁免量，而在每公曆年總豁免額為 **200 公斤**，作本地凍櫃維修及實驗室研究用途

Propose to allow exempted quantity of **10 kg** per applicant and a total limit of **200 kg** in a calendar year for maintenance of refrigeration system and laboratory research in Hong Kong

進口配額制度的要點

Key Features of Import Quota System

- ▶ 進口18種HFCs(不論單一物質或以混合物形式存在)必須具備足夠的進口配額

Import of 18 HFCs (existing alone or in mixture) must be covered by sufficient amount of import quota

- ▶ 每年的配額總量基於《基加利修正案》的削減時間表

Total quota available in each year according to the phasedown schedule of Kigali Amendment

- ▶ 包含**正常配額**和**自由配額**，**70%**及**30%**的比例

Consist of normal quota and free quota, at **70%** to **30%** split

不包括
Exclusion

- 只為轉口而進口的HFCs
HFCs imported solely for re-export
- 預裝在設備中的HFCs
HFCs pre-charged in imported equipment

進口配額制度的要點

Key Features of Import Quota System

- ▶ 正常配額會根據登記進口商過往在留用進口方面的表現而按比例分配
Normal quota allocated to registered importers on a pro rata basis based on their performance of total retained import in the past year(s)
- ▶ 自由配額會分配給新登記的進口商或已用盡該年度正常配額的現有登記進口商
Free quota allocated to new registered importers or existing registered importers who have exhausted their normal quota in that year
- ▶ 所有配額以二氧化碳當量(公噸)計算 (HFCs 的公噸淨重乘以其 GWP)
All quota units are calculated in terms of CO₂ equivalent tonnes (net weight in metric tonnes multiplied by their GWP value)
- ▶ 首次配額分配會基於申請人在緊接的前兩年的留用進口量作基準
Initial normal quota allocation will be based on applicant's retained import in the immediate previous two years

管制策略2 - 加速由高 GWP 產品及設備的轉型

Control Strategy 2 - Accelerate the Transition from the use of High-GWP Product/Equipment

- ▶ 界定某些類別的空調、冷凍和滅火系統為**受限制設備**

Define the types of air-conditioning and refrigeration equipment and fire suppression system as “**Restricted Equipment**”

- ▶ 規定受限制設備設計上使用的製冷劑或滅火劑的**GWP上限**

Prescribe the **GWP limit** on the refrigerant/fire suppressant which the Restricted Equipment contains or is designed to operate on

- ▶ **禁止進口、生產、供應及出售**受限制設備，而該等設備含有或其設計上是使用 GWP 值超逾訂明上限的製冷劑或滅火劑

Prohibit the import, manufacture, supply and sale of the Restricted Equipment containing or designed to operate on refrigerant/fire suppressant with GWP value greater than the prescribed GWP limit

不包括
Exclusion

- 本地用家的二手設備
Second-hand equipment from a local user

受限制設備

Restricted Equipment

受限制設備的類別	GWP 上限	生效日期	
		禁止進口或生產	禁止出售、供應、 要約出售或要約供應
室內冷氣機(分體式或窗口式, 額定製冷量小於 7.5 千瓦)	750	2025 年 1 月 1 日	2026 年 1 月 1 日
家用雪櫃、凍櫃及雪櫃與凍櫃組合	150	2025 年 1 月 1 日	2026 年 1 月 1 日
商用冷凍設備 - 獨立系統	150	2025 年 1 月 1 日	2026 年 1 月 1 日
商用冷凍設備 - 冷凝機組	1500	2025 年 1 月 1 日	2026 年 1 月 1 日
	150	2028 年 1 月 1 日	2028 年 1 月 1 日
商用冷凍設備 - 超級市場系統	1500	2025 年 1 月 1 日	2026 年 1 月 1 日
	150	2028 年 1 月 1 日	2028 年 1 月 1 日
冷凍倉庫系統	1500	2025 年 1 月 1 日	2026 年 1 月 1 日
	150	2028 年 1 月 1 日	2028 年 1 月 1 日
風冷式冷水機	750	2025 年 1 月 1 日	2026 年 1 月 1 日
水冷式冷水機	150	2025 年 1 月 1 日	2026 年 1 月 1 日
私家車的汽車空調機 (私家車根據《道路交通條例》(第 374 章)的定義)	150	生產年份 2027 年	生產年份 2027 年
滅火系統	15	2025 年 1 月 1 日	2026 年 1 月 1 日

Category of Restricted Equipment	GWP Limit	Effective date	
		Prohibition of import or manufacture	Prohibition of sale, supply, offer for sale or offer for supply
Room air-conditioner (split type or window type, with rated cooling capacity < 7.5kW)	750	1 Jan 2025	1 Jan 2026
Household refrigerator, freezer and refrigerator combined with freezer	150	1 Jan 2025	1 Jan 2026
Commercial refrigeration - stand-alone system	150	1 Jan 2025	1 Jan 2026
Commercial refrigeration - condensing unit	1500	1 Jan 2025	1 Jan 2026
	150	1 Jan 2028	1 Jan 2028
Commercial refrigeration - supermarket system	1500	1 Jan 2025	1 Jan 2026
	150	1 Jan 2028	1 Jan 2028
Cold storage warehouse system	1500	1 Jan 2025	1 Jan 2026
	150	1 Jan 2028	1 Jan 2028
Air-cooled chiller	750	1 Jan 2025	1 Jan 2026
Water-cooled chiller	150	1 Jan 2025	1 Jan 2026
Motor vehicle air-conditioning - private car (as defined in the Road Traffic Ordinance, Cap.374)	150	Manufacture year 2027	Manufacture year 2027
Fire suppression system	15	1 Jan 2025	1 Jan 2026

標籤受限制設備

Labelling of Restricted Equipment

- 為提升執法效率並鼓勵守法，我們建議就所有受限制設備施加**產品標籤**規定

We propose to impose requirement of **on-product labelling** for all Restricted Equipment to facilitate enforcement and encourage compliance

- 如受限制設備在付運期間是載於箱子或其他類別的包裝內，包裝外面亦須附有包含相同資料的標籤

If the Restricted Equipment is contained in a box or other types of packing during shipment, label should be adhered on the exterior packaging

標籤應包含的資料 Label shall contain information of

- 製冷劑或滅火劑的類別
- 製冷劑或滅火劑的 **GWP** 值
- 生產日期
- 禁止出售/供應的日期

- Type of refrigerant or fire suppressant
- GWP value of the refrigerant or fire suppressant
- Date of manufacture
- Date for the ban of sale / supply

管制策略3 - 推動製冷劑的回收

Control Strategy 3 - Drive Refrigerant Recycling

- ▶ **強制**規定在保養、維修和停用空調及冷凍設備時，須從設備**回收**製冷劑(包括消耗臭氧層物質和 HFCs)，並**禁止蓄意排放**

Mandatory recovery any refrigerant (including ozone-depleting substances and HFCs) from air-conditioning and refrigeration equipment during equipment maintenance, servicing and decommissioning and **prohibit their venting**

- ▶ 包括的設備(**受規管設備**): **製冷劑量超過 50 公斤**的設備，大致包括於中至大型樓宇的中央冷氣系統(冷水機)，超級市場和冷凍倉庫中央冷凍系統

Equipment covered (“**Regulated Equipment**”): contains **over 50 kg refrigerant charge**, basically covering central air-conditioning system (chiller) in medium to large building, central refrigeration system in supermarket and cold storage warehouse

- ▶ 明確列明設備擁有人和服務承辦商的責任

Set out clearly the responsibilities of equipment owner and service contractor

服務承辦商(製冷劑處理承辦商)的要求

Requirement on service contractor (refrigerant handling contractor)

- ▶ 如為受規管設備進行製冷劑處理工作，包括安裝和測試、檢測和滲漏檢查、保養或維修、製冷劑加注、回收或移注製冷劑，以及停用設備等，必須向環保署註冊為**註冊製冷劑處理承辦商**

Register with Environmental Protection Department (EPD) as **Registered Refrigerant Handling Contractor** for carrying out any work involving handling of refrigerant, including installation and commissioning, inspection, leakage checking, maintenance or servicing, refrigerant refilling, refrigerant recovery or decanting, and decommissioning, on Regulated Equipment

服務承辦商(製冷劑處理承辦商)的要求

Requirement on service contractor (refrigerant handling contractor)

責任 Responsibilities

提供充足且妥善保養維修的設備，並制定和維持政策和操作程序予其技術人員

Provide adequate and properly maintained equipment, and establish and maintain policies and operating procedures to its technicians

安排認可技術員(其擁有由署方認可的訓練機構發出的證書)在場進行製冷劑處理工作

Arrange certified technician (who holds a certificate issued by training institutes as recognized by the Authority) on-site for carrying out the refrigerant handling work

安排其回收的製冷劑在持牌的廢物處置設施處置，以再生利用或銷毀製冷劑，除非該製冷劑是再循環充入原本的設備或轉移到相同擁有人的其他設備以供使用

Arrange the recovered refrigerant to be disposed of at licensed waste disposal facility to get them reclaimed or destroyed, unless the refrigerant is charged back to the same equipment or transferred for use in other equipment owned by the same owner

在工程完成後兩個月內向環保署提交工作的記錄

Submit service record to EPD within 2 months after completion of the work

設備擁有人的要求

Requirement on equipment owner

- ▶ 現有受規管設備的擁有人必須在規例生效之日起**六個月內**向環保署登記其受規管設備

Owners of existing Regulated Equipment must register their equipment with EPD **within 6 months** from the effective date of the regulation

- ▶ 新安裝的受規管設備（在本規例生效日期後安裝）的擁有人必須在完成安裝後的**兩個月內**向環保署登記其受規管設備

Owners of any newly installed Regulated Equipment (i.e. installed after the effective date of the control) must register their equipment with EPD **within 2 months** from the completion of installation

設備擁有人的要求

Requirement on equipment owner

- ▶ 受規管設備的擁有人在進行任何涉及處理製冷劑的工作時，必須**聘用註冊製冷劑處理承辦商**。如設備擁有人透過內部員工處理受管制製冷劑，該擁有人的員工或公司本身必須向環保署註冊

Owners of Regulated Equipment must **engage Registered Refrigerant Handling Contractor** for carrying out any refrigerant handling work. If the equipment owner use in-house staff to do the work, the staff or the company concerned must register with EPD

- ▶ 擁有人定義為對受規管設備有管理權或控制權的人

Owner is defined as the person who has the management or control of the Regulated Equipment

附加措施 - 生產者責任計劃

Further supporting measure - producer responsibility scheme

- ▶ 我們建議通過修改《產品環保責任條例》（第603章），就進口受管制製冷劑和/或預裝受管制製冷劑的設備引入強制性生產者責任計劃

We propose to introduce a mandatory producer responsibility scheme on the import of HFC refrigerant and/or equipment pre-charged with HFC refrigerant, through amending the Product Eco-Responsibility Ordinance, Cap. 603

- ▶ 讓進口商和用家承擔製冷劑回收和再生成本的主要責任，以支援提供製冷劑回收和再生服務的服務承辦商和設施

To place primary responsibility for the cost of refrigerant recovery and reclamation to importers and users of equipment to support service contractors, facilities that provide refrigerant recovery and reclamation services

- ▶ 支持HFC的削減 To support the HFC phasedown
- ▶ 減少HFC的排放 To reduce HFC emission

附加措施 - 生產者責任計劃

Further supporting measure - producer responsibility scheme

- ▶ 建議於首階段，為私家車空調中使用的HFC製冷劑引入過渡性的生產者責任計劃，該計劃會實施至GWP上限的禁令生效

As the first phase, we propose to introduce a transitional producer responsibility scheme for HFC refrigerant used in air-conditioning of private car, and operate the scheme until the GWP limit control takes effect

- ▶ 推動汽車進口商轉用非HFC製冷劑
To drive car importers to switch to non-HFC refrigerants
 - ▶ 避免香港成為被傾銷仍有供應的過時設備的地方
To prevent HK from becoming a dumping site of outdated equipment that are still available in supply
 - ▶ 減少產品廢棄時的HFC排放
To reduce HFC emission at their end-of-life
- ▶ 我們正制定計劃的詳情
Details of the scheme to be worked out

我們的建議

Our Proposals

1. 氫氟碳化物(HFC)的挑戰
Challenge of Hydrofluorocarbons (HFCs)
2. 我們對管制及削減HFCs的建議
Our Proposals to Regulate and Phasedown HFCs
3. 徵詢意見
Views Invited

期待您寶貴的意見

Share Your View with Us

截止日期: 2023年9月9日
Deadline: 9 September 2023

- ▶ 歡迎您提供寶貴的意見，回應我們的諮詢問題

We welcome your views on the proposed measures by responding to the consultation questions

- ▶ 諮詢文件連結:

https://www.epd.gov.hk/epd/sites/default/files/epd/tc_chi/environmentinhk/air/pub_consult/files/rpdh_consult_chi.pdf

Link to the consultation document:

https://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/air/pub_consult/files/rpdh_consult_eng.pdf

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