Ministry for the Environment
Manatū Mō Te Taiao

PROACTIVE RELEASE COVERSHEET

Minister	Minister Penny Simmonds	**Portfolio**	Environment
Name of package	Advice on refrigerants for the second emissions reduction plan	**Date to be published**	February 2025

List of documents that have been proactively released		
Date	***Title***	***Author***
14 November 2024	CAB-472 Cabinet Paper: Proposed product stewardship regulations for synthetic refrigerants	Minister for the Environment
14 November 2024	CAB-472 Appendix 1: Sector share of GWP emissions	Minister for the Environment
14 November 2024	CAB-472 Appendix 2: Summary of submissions	Minister for the Environment
14 November 2024	CAB-472 Appendix 3: Supplementary Analysis Report	Minister for the Environment
14 November 2024	CAB-472 Appendix 4: 'Sale in accordance' under accredited scheme	Minister for the Environment
14 November 2024	CAB-472 Appendix 5: Industry-proposed training matrix	Minister for the Environment
20 November 2024	ECO-24-MIN-0259 Minute	Minister for the Environment

Information redacted **YES**

Any information redacted in this document is redacted in accordance with the Ministry for the Environment's policy on proactive release and is labelled with the reason for redaction. This may include information that would be redacted if this information was requested under Official Information Act 1982. Where this is the case, the reasons for withholding information are listed below. Where information has been withheld, no public interest has been identified that would outweigh the reasons for withholding it.

Summary of reasons for redaction

One paragraph (84) is redacted in CAB-472 Appendix 3: Supplementary Analysis Report under section 9(2)(b)(ii) of the Official Information Act, as there is a risk of prejudicing commercial position.

In Confidence

Office of the Minister for the Environment

Chair, Cabinet Economic Policy Committee

Proposed product stewardship regulations for synthetic refrigerants

Proposal

1 The purpose of the paper is to seek policy decisions on proposed regulations to reduce risk of environmental harm from release of synthetic refrigerant gases, and agreement to publish the summary of submissions from public consultation on the proposed regulations and for officials to begin drafting the proposed regulations.

Relationship to government priorities

2 The proposal supports two Coalition Government priorities by addressing causes of synthetic refrigerant leakage in New Zealand:

2.1 improving and protecting the environment from harm

2.2 reducing net greenhouse gas emissions, supporting the delivery of New Zealand's 2050 net zero climate change targets.

Executive Summary

3 Refrigerants are essential to heating, ventilation, air-conditioning and refrigeration (HVACR), enable the 'cold chain' for transport and storage of perishable food and medicines, and are critical to New Zealand's domestic and export economy.

4 Refrigerants can also cause harm if not kept safely contained. Risk of harm from refrigerant emissions is either environmental (from synthetic refrigerants, contributing to ozone layer destruction and/or climate change) or health and safety (from alternative 'natural' refrigerants which can be toxic, flammable or require a very high operating pressure).

5 Most emissions are from leaks in improperly installed or maintained equipment and from disposal of end-of-life equipment. The sector considers that this is mainly due to difficulty in enforcing the existing prohibitions against release, technicians working outside their areas of competence, and plant owners allowing gas discharges instead of paying to repair leaks or safely collect and dispose of gases.

6 Synthetic refrigerant emissions are estimated to make up about 2 per cent of New Zealand's annual greenhouse gas emissions (Appendix 1). Refrigerant emissions are not necessary for effective HVACR services and can be prevented with existing technology and practices. This presents an opportunity unavailable in other larger emission sectors.

7 I propose introducing regulations under the Waste Minimisation Act 2008 (WMA) to support next steps to enable industry-led product stewardship to help bring New Zealand up to widely adopted international best practice. This includes restricting access to purchase and disposal of synthetic refrigerants to technicians qualified under recognised industry standards. It is not a complete solution but is likely to significantly improve industry practice and outcomes and build a better information base to inform next steps. The proposal has broad support from industry.

8 If regulations are enacted in 2025, this initiative is estimated to reduce domestic emissions by **422 kilo tonnes (kT) CO2e to 2030 and 716 kT to 2035,** with no direct scheme cost to businesses and consumers.

9 The Cool-Safe product stewardship scheme is funded by emission credits earned under the Emissions Trading Scheme (ETS) for destroying synthetic refrigerant gases. This includes funding for courier collection of surplus gases and their destruction free of charge to industry and bounties to incentivise collection. Costs of improving workforce certification would be shared by the scheme and the HVACR industry and phased in over three years.

10 Subject to Cabinet approval, I propose to bring back draft regulations to Cabinet for decision by May 2025.

11 I am also seeking Cabinet's agreement to publish *Summary of submissions: Proposed measures to reduce the environmental impact of fluorinated gases* (Appendix 2, subject to minor editorial corrections as required).

Background

Problem definition

12 Synthetic refrigerants pose a risk to ozone layer depletion and climate change if allowed to leak through poor equipment design, maintenance or disposal. To be disposed of safely, synthetic refrigerants need to be kept contained and destroyed at very high temperatures.

13 The existing regime has information and skill gaps and does not provide sufficient incentive for such emissions to be prevented, resulting in comparatively low recovery for disposal rates and costs to society and the environment. Current government initiatives mainly target refrigerants early in their use cycle: the stock of refrigerants currently in use and in equipment at their end of life is given less consideration.

14 Continued harm to the environment from release of synthetic refrigerants into the environment would result in contribution to climate change and estimated economic costs of up to $437 million in the period to 2050.[1]

Factors contributing to leakage

15 Industry members pursuing best practice have consistently alerted government to providers topping up instead of repairing leaking systems. Reported factors include technicians working outside their areas of competence, lack of strong economic incentives to change behaviour, plant owners allowing gas discharges instead of paying to repair leaks or safely collect and dispose of gases, and difficulty in enforcing the existing prohibitions against release.[2] There are limited legal reporting requirements for sector participants and anecdotal evidence informs industry's approach to reform.

Industry leadership in product stewardship

16 Industry established the Trust for the Destruction of Synthetic Refrigerants (the Trust) which has operated the voluntary Refrigerant Recovery scheme since 1993. The scheme has been accredited under the WMA since 2010 and recently been upgraded and rebranded as Cool-Safe. Since inception the scheme has reduced risk of environmental harm from over 1,496,691

[1] Supplementary Analysis Report (Appendix 3): calculation based on Treasury guide to social cost benefit analysis.
[2] Ozone Layer Protection Act section 13(f) and Climate Change Response Act section 264.

tonnes of CO_2 equivalent greenhouse gas emissions and 39,800 tonnes of ozone depleting gases.[3]

17 It is estimated that to 2022/23 about 10 per cent of all HFCs retired were collected for destruction and 12 per cent recycled.[4] This means the fate of 78 per cent is uncertain, potentially lost to emissions or stored. In contrast, overseas regulated product stewardship schemes and/or refrigerant technician qualification requirements have seen recovery rates significantly lifted, up to 92 per cent.[5]

Regulated product stewardship for refrigerants

18 In July 2020, refrigerants and other synthetic greenhouse gases were declared a priority product under the WMA. This requires a product stewardship scheme to be developed and accredited and allows regulation to prohibit the sale of a product except in accordance with an accredited scheme, to create sector-wide participation. Development of a regulated product stewardship scheme for refrigerants was an action under the first emissions reduction plan and its implementation is included as a new measure in the second emissions reduction plan.

19 An industry-led working party[6] designed a regulated product stewardship scheme to address causes of harm from emissions that could be influenced under WMA regulatory powers and the Cool-Safe scheme reflects this design. New services to be provided under a regulated framework include establishment of an 'umbrella registry' for technicians to recognise their qualifications for managing refrigerants safely (both synthetic and 'naturals').

20 The Cool-Safe scheme and its synthetic refrigerants collection and destruction services are fully funded by emission credits (New Zealand Units or NZUs) received under the ETS. These credits are obtained through the Environmental Protection Authority with proof of gas type and volumes and export or destruction and can be traded in the ETS credits market for liquidation into funding.

Workforce competence

21 Most refrigerant technicians over their career will encounter both synthetic refrigerants and their low global warming potential (GWP) alternatives. Approximately 16,775 people work on HVACR equipment with varying levels of training (Table 1).

Table 1: Estimated HVACR workforce in New Zealand (source: Appendix 3)

Estimated workforce	HVACR sectors
7,000	Approved Fillers registered under WorkSafe framework (generic 1 day course – not specific to risk from synthetic refrigerants or alternatives)
3,200	Licensed electricians (no required training in gas emission risks)
1,775	Automotive sector technicians (as above)
4,800	Unqualified people working on heat pumps (no requirements for industry training, high risk of emissions)
16,775	**Total**

22 Alternative low GWP refrigerants being phased in may be toxic, flammable or require a very high operating pressure. To help prevent harm, High-Risk Work Licences for work in the

[3] Trust for the Destruction of Synthetic Refrigerants Annual report for year ended 31 March 2024..
[4] Verum Group. 2023. *Projections of HFC stocks and emissions to 2033 for policy options.*
[5] For example, Australia 35-61 per cent and UK 65-92 per cent (varies by type of gas or end use) and California 80 per cent for large equipment. Measurement methods vary by country.
[6] Representatives on the working party in 2020 were from the Institute of Refrigeration Heating and Refrigeration Engineers, Climate Control Companies Association NZ, Refrigerant Licence NZ, the Trust for the Destruction of Synthetic Refrigerants, bulk importers, and the automotive and heat pump sectors.

highest risk settings were proposed by the previous Government. This work has been paused pending the outcome of consultation on the work health and safety regulatory system. Proposed coverage excluded work on domestic systems (eg, domestic heat pumps), light commercial systems and automotive air conditioning. The risk of refrigerant leakage in the heat pump and automotive sectors is currently high.

23 The Cool-Safe product stewardship scheme funded an Independent Review of Refrigerant Sector Training in 2023. It found sector participants aligned in seeking improvement to industry training and qualifications, support for modular and responsive credentials, and potential for rapid progress through adapting resources developed by the industry in Australia. A Strategic Leadership Forum has been set up and the first modular micro-credential pilot is underway with the heat pump sector.[7]

24 The industry has a mix of formal and informal training opportunities and limited data on qualifications held by the HVACR workforce. Estimated potential regulatory impacts of training requirements are based on the High-Risk Work Licences impact assessment and industry advice (Appendix 3). A three year phase-in and the 'stackable micro-credential' approach promoted by Cool-Safe should help spread and reduce impacts.

Option assessment

25 The objective of the proposed regulations is to achieve the purpose of the WMA[8] in relation to synthetic refrigerants. The overall outcomes sought are to increase the volume of synthetic refrigerant recovered for destruction or safe reuse, reduce harmful discharges to the environment, lift the skills of those in the industry to reduce the potential for harm from refrigerants, and shift costs of emissions from society and the environment to those in the sector who give rise to the costs. Implementing a 'regulated product stewardship scheme for refrigerants' is included as a new measure' in the second Emissions Reduction Plan. If regulations are enacted in 2025, this initiative is estimated to reduce domestic emissions by 422 kT CO2e to 2030 and 716kT to 2035 at almost no cost to businesses and consumers. Commissioned modelling suggests synthetic refrigerant recovery rates (for destruction or reuse) could increase to 15 per cent in 2025 and up to 35 per cent by 2033.[9]

Feedback from consultation

26 The industry-led scheme design informed consultation on proposed regulations. Assessment of the proposal against the status quo in the supplementary assessment report is summarised in Table 2.

27 Public consultation was held from 8 November to 18 December 2022 and received 38 submissions, primarily from business/industry, local authorities, and individuals. A good cross-section of the HVACR sector made submissions. Overall, 87 per cent of submitters agreed in principle to the proposal to introduce a regulatory framework for synthetic refrigerants. The full summary of submissions report proposed for publication can be found in Appendix 2.

Table 2: Comparison of proposed regulations with the status quo

[7] https://coolsafe.org.nz/news/independent-review-into-hvacr-training-update
[8] WMA section 3: to encourage waste minimisation and a decrease in waste disposal in order to protect the environment from harm and provide environmental, social, economic and cultural benefits.
[9] Verum Group. 2023. Projections of HFC stocks and emissions to 2033 for policy options.

Criteria	Regulated product stewardship scheme
Effective – reduces actual and potential environmental harm	**++** Through better training, improved data collection and better workforce understanding of environmental impacts of refrigerants, release of harmful gases into the atmosphere would reduce and rates of gas recovery for destruction or safe reuse are expected to increase.
Efficient – raises societal well-being	**+/-** There are costs to all parts of the refrigerant industry, some of which may be substantial over time (eg, upgraded training). The benefits of standardised training are intuitive for high-risk products/industry. Associated values are less certain but the balance of the negative and positive values suggests a net benefit to society. As the training component will have a more significant impact on industry, the timing has been adjusted to allow for a phased transition (three years proposed).
Equitable – apportions costs in a way that better aligns private and social costs	**+** Shifts costs from society in general and the environment to reducing the impact of those whose decisions currently add costs. Scheme costs paid by NZU emission credits earned under ETS for removal of gases: not charged directly to sector.
Implementable – able to be implemented	**+** There are some risks to implementation, but their likelihood and impact is not known at this stage. Mitigation options exist, and industry stakeholders are aware that further development in some areas is required as the scheme beds in.

Key: compared to status quo: - worse - - much worse + better ++ much better

Implementation

28 I propose that the regulations be introduced in two tranches with qualification requirements to commence three years after tranche 1 to enable the sector to upgrade training standards and technician training. Development of an updated industry training and certification framework would involve existing industry training organisations and resources.[10] The accredited Cool-Safe scheme would provide a national registry to allow technicians to register their qualifications and areas of competence.

29 The accredited scheme will set record-keeping requirements relating to membership with the scheme (indicative measures in Appendix 4) and escalate regulatory enforcement issues to the Ministry. The Ministry will be responsible for conducting audits of scheme performance and enforcement of regulations.

Proposed regulations

Tranche 1 – Scheme participation requirement

30 I propose introducing regulation under WMA section 22(1)(a) to prohibit sale of refrigerant except in accordance with an accredited scheme. This would engage the sector directly in reducing risk of environmental harm.

Tranche 1 - Disposal requirements

31 I propose to restrict under WMA section 23(1)(a) the disposal of synthetic refrigerants under the scope of the priority product declaration to destruction in a plant that meets criteria approved by the Parties to the Montreal Protocol.[11] Such destruction eliminates the potential for those gases to contribute to climate change and/or ozone layer destruction, and as proposed could occur onshore or offshore.

[10] For example, the Hanga-Aro-Rau Workforce Development Council, the Refrigerant Licencing Trust Board, the training framework created by the Institute of Refrigeration Heating and Air Conditioning Engineers for the Synthetic Refrigerant Stewardship Working Group (Appendix 5), and training resources developed for the Australian HVACR certification framework.

[11] Decision XXX/6: Destruction technologies for controlled substances | Ozone Secretariat (unep.org)

32 The voluntary scheme previously exported synthetic refrigerants to an Australian plasma arc facility for destruction. The Trust has commissioned an onshore plasma arc plant designed to meet criteria approved by the Parties to the Montreal Protocol. Commissioning of this new and enabling technology is being funded by emission credits earned under the ETS, as will destruction of synthetic refrigerants collected under the scheme.

Tranche 1 -Take-back and destruction service requirement

33 I propose progressing take-back requirements under WMA section 23(1)(c) but not set associated targets at this time. The Ministry will monitor scheme performance against their targets set at accreditation and regulated targets could be considered when regulations are next reviewed.

Tranche 1 - Information collection and provision requirements

34 The Ministry for the Environment (the Ministry) would require records to monitor and enforce the above regulations. I propose requiring the following under WMA section 23(1)(i).

34.1 Retailers and wholesalers to keep a register of people who purchase refrigerants and their status of either accredited scheme participants or qualifications under recognised industry standards and provide this information to the Secretary for the Environment on request

34.2 Refrigerant technicians and heating, ventilation, and air conditioning companies to keep records on the method of refrigerant disposal and provide this information to the Secretary for the Environment on request. Alignment is possible with existing data collection frameworks in the Environmental Protection Agency.

Tranche 2 - Qualification requirements

35 I propose introducing regulation under the WMA to incentivise improved sector training and to reduce risks from synthetic refrigerant emissions. I propose that these regulations have a commencement date three years after the in-effect date for the tranche 1 regulations, to

35.1 Restrict the sale of bulk and pre-charged synthetic refrigerant to technicians qualified under recognised industry standards (WMA section 23(1)(b)).

35.2 Restrict the recovery of synthetic refrigerants and decommissioning of equipment containing these gases to technicians qualified under recognised industry standards (quality standard under WMA section 23(1)(g and h).

Regulation making requirements in the Waste Minimisation Act

36 Before recommending the making of the proposed regulations, I must consider the requirements of the WMA under sections 22(2) and 23(3). I confirm that:

36.1 I have obtained and considered advice from the Waste Advisory Board.

36.2 I am satisfied that there has been adequate consultation with parties who may be significantly affected. In addition, officials will ensure that key parties have an opportunity to comment on an exposure draft.

36.3 I am satisfied that benefits from implementing these regulations are likely to exceed the costs expected from implementation, and that the regulations are consistent with international obligations. The Ministry will ensure Trans-Tasman Mutual Recognition Agreement and World Trade Organisation - Technical Barrier to Trade processes are followed as required for draft regulations when available.

Impact Analysis

Regulatory impact assessment

37 The previous Government agreed in principle to the proposals for regulations to support effective delivery of product stewardship for synthetic refrigerants and requested a Supplementary Assessment Report (attached as Appendix 3). This report has been reviewed by a quality assurance panel with members from the Ministry's delegated Regulatory Impact Statement Review Panel. The panel assessed this using assessment criteria (complete, convincing, clear & concise and consulted) for all relevant sections of the report. The panel considers that all its feedback was addressed and therefore it meets the Quality Assurance criteria.

Expected impact of proposed approach

38 The net benefit of a regulated product stewardship scheme for refrigerants ranges from -$194 million in a low impact scenario to $247 million in a high impact scenario in present value terms in the period to 2050. The wide range results from uncertainty in the legacy synthetic refrigerant bank and emissions data and the current absence of reporting requirements relating to synthetic refrigerant use and disposal. Industry stakeholders acknowledge the data-poor environment and expect the regulated scheme would provide the core of a solution.

39 Scheme operation would be self-funded, as NZUs obtained under the ETS will cover the cost of scheme operations and refrigerant disposal. All relevant existing training qualifications will be recognised and any additional upgraded training costs will remain with the sector. The accredited scheme will earn approximately $115 million in NZU over the first seven years[12] of operation.

Climate implications of policy assessment

40 The Climate Implications of Policy Assessment (CIPA) team has been consulted and confirms that the CIPA requirements apply to this proposal given that a primary objective is to reduce emissions. The Ministry's CIPA team has reviewed the modelling approach and results at a high level and considers them reasonable. They also note that the estimated reductions are subject to high levels of uncertainty given limited data availability.

41 Modelling by a consultant to the Ministry estimates that these proposals are expected, if regulations are enacted in 2025, to have a domestic emissions reduction impact of 422 kT CO2e to 2030 and 716kT to 2035, with no direct scheme cost to businesses and consumers.

Population implications

42 The proposals will mainly impact wholesale suppliers of synthetic refrigerants and technicians operating on HVACR equipment throughout the economy and do not target particular communities. Rural users of HVACR services (eg, milk vats, packing houses, cool stores) may have limited access to trained technicians (both now and under a new framework) and targeted affordable upgrade services are being developed in the sector.[13]

Cost of living implications

43 Costs to business and consumers from the proposed regulated scheme are likely to be low because it will be funded entirely by NZU emission units earned under the ETS by the scheme for destroying collected synthetic refrigerant. There is no cost to businesses for collection or transport of gases for destruction (free nationwide door to door courier) or the destruction service, and bounties are paid to incentivise participation. Workforce training is a normal business expense, and a three-year phase-in for new requirements is proposed to spread any new costs.

[12] The horizon for scheme reaccreditation under the WMA is seven years, after which reaccreditation is an option (section 17).
[13] Eg, New partnership offers Fonterra farmers cheaper, cleaner refrigeration ; and https://dts.co.nz/products-and-services/refrigeration-and-servicing/refrigerant-upgrade/

44 Consumers who use poor quality operators may find service costs for a trained operator higher, but regular refill maintenance will no longer be required.

Use of External Resources

45 The Ministry used external resources of approximately $45,000 to develop the Supplementary Analysis Report (Appendix 3). This involved the use of two economists with specialised skills to undertake cost-benefit analysis on the proposal impacts.

Consultation

46 The following agencies were consulted: Department of Prime Minister and Cabinet (DPMC), Energy Efficiency and Conservation Authority (EECA), Environmental Protection Authority (EPA), Ministry of Business, Innovation, and Employment (MBIE), Ministry of Foreign Affairs and Trade (MFAT), Ministry for Primary Industries (MPI), Ministry for Regulation (MfR), Ministry of Transport, New Zealand Treasury, Te Arawhiti, Waka Kotahi New Zealand Transport Agency, and WorkSafe New Zealand. Editorial suggestions were received from DPMC, EECA, EPA, MBIE, MPI, and WorkSafe and have all been incorporated into this paper.

Legislative Implications

47 New regulations are required to implement the proposals in this paper to support a regulated product stewardship scheme for synthetic refrigerants.

Financial implications

48 There are no financial implications for the proposals included in this paper.

Human Rights

49 The proposals in this paper are consistent with the New Zealand Bill of Rights Act 1990 and the Human Rights Act 1993.

Communications

50 I intend to announce the policy decisions alongside the release of the Summary of Submissions on the Ministry's website. Details and timing of an announcement will be confirmed in consultation with the Prime Minister.

51 Prior to the regulations being in force the Ministry will ensure that clear messaging (including technical guidance) is provided for the public and the HVACR sector regarding the phase-in of regulations.

Proactive Release

52 I propose to proactively release this Cabinet paper following the policy announcements. The documents will be redacted as appropriate under the Official Information Act 1982.

Recommendations

The Minister for the Environment recommends that the Committee:

1 **Agree** the following actions under sections 22 and 23 of the Waste Minimisation Act 2008:

1.1 prohibit under section 22(1)(a) sale of synthetic refrigerants as defined under the priority product declaration except in accordance with an accredited product stewardship scheme.

1.2 restrict under section 23(1)(a) the **disposa**l of synthetic refrigerant under the scope of the priority product declaration to incineration in a plant that meets criteria approved by the Parties to the Montreal Protocol.

1.3 require under section 23(1)(c) the accredited product stewardship scheme to provide a take-back and destruction service for synthetic refrigerants under the priority product scope.

1.4 require under section 23(1)(i) retailers and wholesalers of synthetic refrigerants under the priority product scope to keep records on the people who purchased synthetic refrigerants and their status of either accredited scheme participation or qualification under recognised industry standards and provide this information to the Secretary for the Environment on request.

1.5 require under section 23(1)(i) all persons disposing of synthetic refrigerants under the priority product scope to keep records on the disposal method to demonstrate compliance with regulations made on refrigerant disposal and provide this information to the Secretary for the Environment on request.

2 **Agree** the following actions under section 23 of the Waste Minimisation Act 2008 to commence three years after the other agreed regulations:

2.1 restrict under section 23(1)(b) the sale of bulk synthetic refrigerant under the priority product declaration scope to technicians qualified under recognised industry standards.

2.2 restrict under section 23(1)(g) and (h) the recovery of synthetic refrigerants and decommissioning of equipment containing these gases to technicians qualified under recognised industry standards.

3 **Invite** the Minister for the Environment to issue drafting instructions to the Parliamentary Counsel Office to draft product stewardship regulations for synthetic refrigerants under Sections 22 and 23 of the Waste Minimisation Act 2008.

4 **Authorise** the Minister for the Environment to approve minor policy changes during drafting of the regulations, in line with the policy decisions agreed by Cabinet.

5 **Agree** to circulate an exposure draft of the synthetic refrigerant regulations for targeted consultation with the accredited synthetic refrigerant scheme and the heating, ventilation, air-conditioning and refrigeration sector.

6 **Invite** the Minister for the Environment to report back to Cabinet by May 2025 with the proposed synthetic refrigerant regulations for decision.

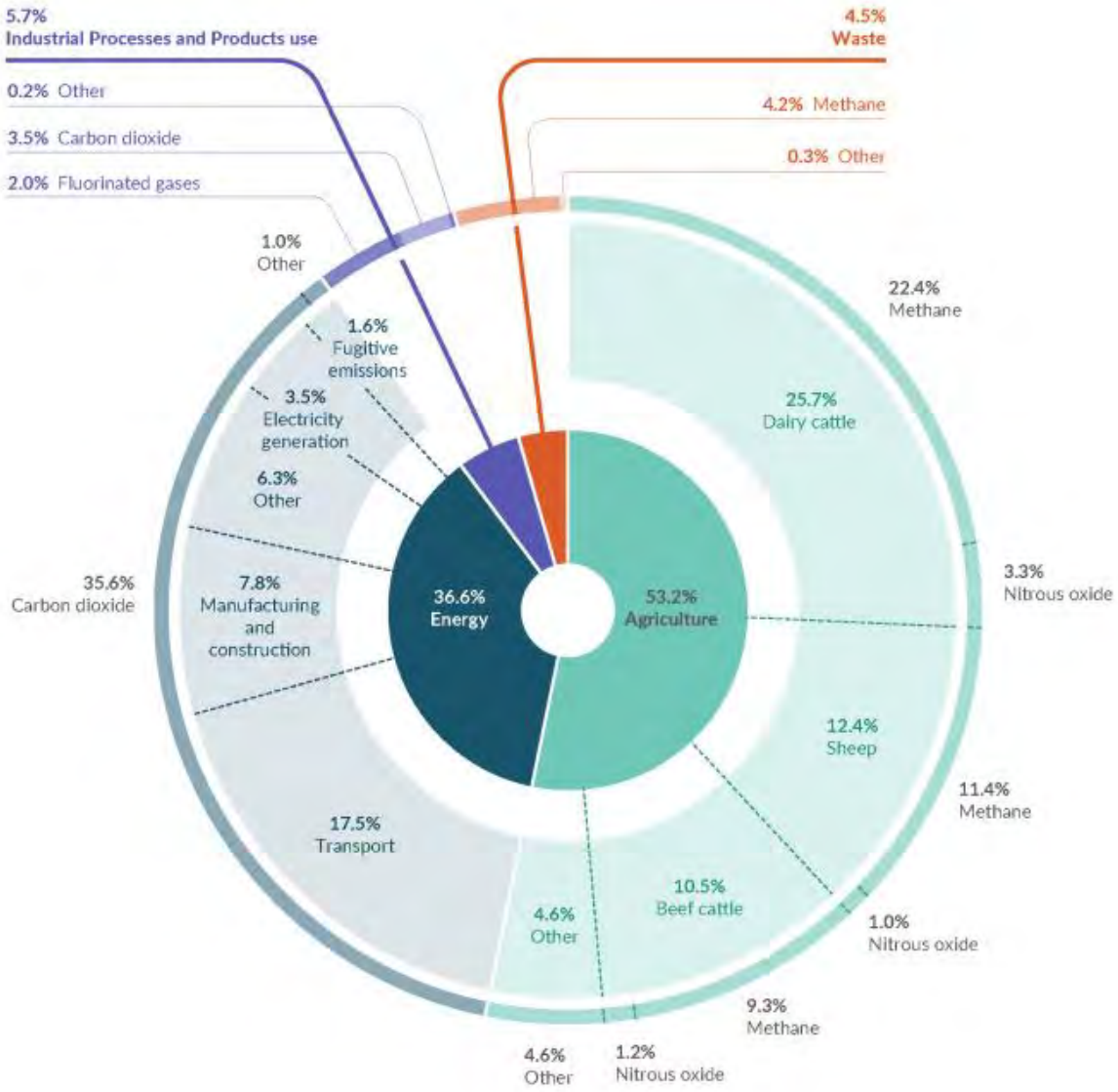
Other matters

7 **Approve** publication of *Summary of submissions: Proposed measures to reduce the environmental impact of fluorinated gases*, subject to minor editorial corrections as required.

Authorised for lodgement

Hon Penny Simmonds
Minister for the Environment

Appendix 1: Sector emissions of global warming potential (GWP) emissions



Source: [New Zealand's Greenhouse Gas Inventory 1990–2022: Snapshot | Ministry for the Environment]

Summary of submissions

Proposed measures to reduce the environmental impact of fluorinated gases

He huarahi marohi ki te whakaheke i te pānga o te haurehu kōwhai ki te taiao

Ministry for the Environment
Manatū Mō Te Taiao

Te Kāwanatanga o Aotearoa
New Zealand Government

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Executive summary

From 8 November to 18 December 2022, the Ministry for the Environment (the Ministry) consulted on proposed regulations for priority product stewardship schemes for synthetic refrigerants and prohibiting the import and sale of certain pre-charged equipment containing hydrofluorocarbons (HFCs).

The Government proposed regulations to:

- require the sale of these synthetic refrigerants and products containing them to be in accordance with an accredited product stewardship scheme
- require workforce competence evidence to work with equipment containing or designed to use fluorinated gases (F-gases), or to purchase bulk or pre-charged refrigerants
- set stewardship scheme targets, quality standards for end-of-life management of refrigerants, and reporting requirements
- prohibit the import and sale of products pre-charged with high global warming potential (GWP) HFCs.

The Ministry received 38 submissions, mostly from business and industry representatives, local authorities and individuals. This report summarises the views expressed in submissions and outlines the main findings, themes and support for each proposal.

This summary report does not make recommendations on the basis of the submissions. Any recommendations will be made through policy advice to the Minister for the Environment.

Product stewardship regulations

Refrigerants and other synthetic greenhouse gases were made a 'priority product' under the Waste Minimisation Act 2008 in 2020. This requires a product stewardship scheme to be developed and accredited for that product and enables regulations to mandate acting in accordance with the accredited scheme.

The consultation proposed regulations to support a mandated product stewardship scheme for fluorinated gases, which had been included as an action in 2022 under the first emissions reduction plan.

The proposed regulations were informed by recommendations to government from an industry co-design working party in 2020. Important elements of the co-designed scheme include improved requirements for workplace competence and widened coverage to other sectors using fluorinated gases (eg, automotive air conditioning and heat pumps).

For more information, see: About product stewardship in Aotearoa New Zealand.

Prohibitions on pre-charged equipment

The consultation proposed prohibitions on the import and sale of products pre-charged with hydrofluorocarbons (HFCs) that have high global warming potential (GWP).

These proposed prohibitions were designed to be implemented once alternative technology becomes available. These proposed prohibitions will enable the government to stop the import of unnecessarily high-GWP gases, while not jeopardising essential industries that rely on refrigerant technology. Because the proposed prohibitions do not target the use of equipment specifically, consumers would only have to replace affected equipment once it reached its end of life.

To achieve this, these proposed prohibitions would be implemented in three tranches (in 2025, 2028 and 2032), with different GWP limits being set for specific classes of equipment. Equipment containing HFCs above those limits would be unable to be imported or sold. The full details of the proposed prohibitions are set out in table 2.

An import prohibition was also proposed on equipment containing ozone-depleting refrigerants. This previous generation of refrigerant has already been banned but can currently still be imported in pre-charged equipment.

For more information, see: Reducing emissions from fluorinated gases.

Key findings

Refrigerant product stewardship

A clear majority of submitters supported the proposed regulatory framework for refrigerant product stewardship (table 1). Suggestions for improvement were also provided.

Table 1: Summary of submissions on refrigerant proposals – per cent support

Proposal	Agreement by those answering the question (per cent)	Agreement by total submitters (per cent)
Regulatory framework for refrigerants – agree in principle	88	74
Obligation to take part – permit sale of refrigerants only, in accordance with an accredited scheme	90	71
Take-back and targets – set minimum expectations for product stewardship organisation to provide service, including recovery, reuse and recycling targets, and reporting	96	65
Qualifications – restrict sale of fluorinated gases (F-gases) to companies and/or people registered with an accredited scheme	87	68
Business requirements – require businesses decommissioning, dismantling, disposing of or recycling equipment containing refrigerants to register with an accredited scheme and demonstrate appropriate competence	93	71
Code of competence – require businesses that install, service, modify, or dismantle any equipment containing or designed to use refrigerants to demonstrate they have appropriate competence under the Ozone Layer Protection Act 1996	89	66

Proposal	Agreement by those answering the question (per cent)	Agreement by total submitters (per cent)
Scheme funding – fund the regulated scheme in the first years through New Zealand Units earned under the New Zealand Emissions Trading Scheme by the Trust for the Destruction of Synthetic Refrigerants	85	61
Quality standard – require businesses decommissioning, dismantling or degassing of any equipment containing refrigerants to ensure F-gases are disposed of through full destruction (such as a plasma arc plant) or are recycled into plant with documented leak-testing and repair protocols	93	68
Recycling – allow recycling of F-gases under a quality standard	65	39

Impacts on business

A number of business and industry submitters gave feedback on the likely impact of the proposed refrigerant regulations on their business operations.

Some refrigeration companies noted that the cost would be minimal because investment has already been made in training on refrigerant handling. Other businesses noted that they expect the scheme will increase their costs and that these costs would be passed on to the consumer. These costs that would be passed on to the consumer were not able to be quantified without further information on the scheme design.

Prohibition on pre-charged equipment

The Government proposed GWP limits (ranging from 150 to 2500) for different categories of equipment, covering household, commercial, transportation and industrial (see table 2). The proposed prohibition on the import and sale of pre-charged equipment containing F-gases received mixed feedback. Submitters generally supported, at least in principle, a prohibition on pre-charged equipment containing F-gases, but only 4 out of the 21 submitters who responded to questions on prohibitions supported all proposed dates for the proposed prohibition and GWP limits.

Most submitters showed support for some prohibitions and opposed others. Submitters provided the following insights on specific prohibitions.

- Most believed the prohibitions for the 2028 and 2032 tranches were seen as too difficult to comment on because a lot of uncertainty exists in the industry about what future alternative refrigerants will be.
- Many submitters supported the 750 GWP limit on household air conditioning and the 150 GWP limit on domestic refrigeration because household air conditioning and domestic refrigeration had already made this transition.

Some conflicting comments were expressed on vehicle air conditioning. Many submitters felt the 150 GWP limit on new vehicles was appropriate because a low-GWP replacement refrigerant is available (R-1234yf). However, vehicle industry organisations commented that it is not as simple as having a viable alternative and that other factors need to be considered for a prohibition involving vehicles.

Many submitters felt the definitions of the categories provided were too broad and expressed a need for greater clarity.

Submitters raised these issues about the refrigerant industry.

- Manufacturers need notice in advance of changes to product importation requirements because changes can take three to nine years to be implemented.
- Some submitters were of the view that the energy efficiency of the refrigerant use in equipment needs to be considered, as well as the GWP of the refrigerant.
- Submitters also mentioned that any prohibitions on heat pumps should not undermine efforts to move away from air-conditioning technologies that are responsible for higher emissions.
- Because most prospective alternative refrigerants are flammable to some degree, a submitter suggested that controls will be necessary to ensure health and safety is not jeopardised in the effort to secure emissions reductions.

Most submitters strongly supported proposed prohibition on equipment pre-charged with ozone-depleting refrigerants. A couple of comments suggested exceptions be made for equipment exported to Pacific nations, which may still be reliant on this technology, and for classic and vintage car collectors.

About the consultation

This document reports on the findings of public consultation by the Ministry for the Environment (the Ministry) from 8 November to 18 December 2022. The consultation sought feedback from New Zealanders on proposed measures to reduce the environmental impact of fluorinated gases.

View the 2022 consultation.

Background

Fluorinated gases (F-gases) and synthetic refrigerants have long been regulated in Aotearoa New Zealand as a way of meeting the country's international obligations under the Montreal Protocol on Substances that Deplete the Ozone Layer and the Paris Agreement, in recognition of their impact on the environment. F-gases have been part of the New Zealand Emissions Trading Scheme (NZ ETS) since 2013, ozone-depleting refrigerants were phased out under the Ozone Layer Protection Act 1996, and hydrofluorocarbons (HFCs) are in the process of being phased down using import restrictions since 2020.

In July 2020, refrigerants and other synthetic greenhouse gases were made a priority product under the Waste Minimisation Act 2008 (WMA).

In advising the Government on meeting Aotearoa New Zealand's emissions budgets, He Pou a Rangi | Climate Change Commission made recommendations in May 2022 on how F-gas emissions should be reduced. This included recommendations that "measures to reduce HFCs should include expanding import restrictions where feasible". Proposals to address the recommendations were consulted on to inform actions to be included in the first emissions reduction plan(ERP1).

The ERP1 contained four actions related to F-gases. These were:

- Action 16.1: Develop training and accreditation for handling alternative gases
- Action 16.2: Prohibit imports of pre-charged equipment
- Action 16.3: Investigate prohibiting F-gases with high GWPs
- Action 16.4: Introduce a mandatory product stewardship scheme for refrigerants.

Following further policy development in mid-2022, both actions 16.2 and 16.4 required consultation to progress. Because both projects had the same stakeholders, they were consulted on jointly in late 2022.

This document summarises submissions from the consultation *Proposed measures to reduce the environmental impact of fluorinated gases*. This consultation proposed regulations to support effective outcomes from accredited product stewardship schemes for refrigerants, and proposed prohibition on the import and sale of equipment pre-charged with HFCs.

Product stewardship

Once a product is declared as a priority product under the WMA, a product stewardship scheme needs to be developed and accredited for that product. Regulations can be put in

place to ensure the sale of that product be in accordance with the scheme and supports its effective implementation.

To date, schemes for the priority products have been co-designed by stakeholders and supported by the Waste Minimisation Fund.

The Minister for the Environment decides on accreditation, subject to criteria in the WMA. While the Ministry has undertaken public consultation on proposed regulations to give effect to priority product stewardship schemes, the proposed schemes for accreditation are not subject to public consultation under the WMA.

Proposals

The following regulations were proposed during public consultation for a refrigerant product stewardship scheme.

- **Participation obligation (WMA, 22(1)(a))**
  Prohibit the sale of refrigerants except in accordance with an accredited product stewardship scheme.
- **Sale of refrigerants (WMA, 23(1)(b))**
  Restrict the purchase of refrigerants only to persons who meet qualification requirements set by an accredited product stewardship scheme.
- **Quality standards (WMA, 23(1)(g) and (h))**
  Set quality standards to ensure that best practice is followed for managing refrigerants to prevent harm.
- **Disposal and leak testing (WMA, 23(1)(a))**
  Restrict the disposal of refrigerants to a method that ensures it undergoes a chemical composition change and restrict the recycling of refrigerants to plants with document leak-testing protocols and procedures.
- **Take-back service (WMA, 23(1)(c) and 23(1)(i))**
  Require the accredited scheme to provide a free and convenient product collection service, and information provision requirements related to this.
- **Targets (WMA, section 23(1)(c) and 23(1)(i))**
  Set collection and recycling targets for accredited schemes, and information provision requirements related to this.

Prohibitions on pre-charged equipment

Proposals

The prohibitions proposed on the import and sale of pre-charged equipment can be found in table 2. After specified dates, limits would be imposed on the GWP of a refrigerant that can be contained within specified classes of goods.

Table 2: Proposed timeline of prohibitions proposed in the 2022 consultation

Type of good	Date of prohibition and upper global warming potential limit		
	From 1 January 2023	From 1 January 2028	From 1 January 2032
Household refrigerators and dehumidifiers	150	–	–
Household and small commercial air conditioning, heat pumps and air conditioners	750	150	-–
Household and small commercial water-heating heat pumps	150	–	–
Vehicle air conditioning (excluding trains and buses)	150 (for new vehicles)	150 (for used vehicles)	-–
Passenger vehicle air conditioning (eg, trains and buses)	750 (for new vehicles)	–	150 (new and used vehicles)
Heavy commercial and industrial air conditioning (eg, office buildings and retail including variable refrigerant flow systems)	750	–	150
Commercial refrigeration (eg, food retail, supermarkets and self-contained cabinets)	–	150	–
Commercial refrigeration (eg, less than 40 kilowatts rated capacity excluding food retail and applications below –50 degrees Celsius	1500	750	–
Transport refrigeration (eg, refrigerated trucks, shipping containers, fishing boats and reefer vessels)	–	1500	750
Industrial refrigeration (eg, stationary refrigerant systems with rated capacity more than 40 kilowatts excluding applications below –50 degrees Celsius)	2500	150	–

These prohibitions were designed to be effective as alternative technology becomes available. This would enable the Government to stop the import of unnecessarily high-GWP gases without jeopardising essential industries that rely on refrigerant technology. Because the proposed prohibitions do not target the use of affected equipment, consumers would only have to replace equipment once it reached the end of its life.

Prohibition on the import and sale of equipment containing ozone-depleting refrigerants was also proposed. These are a previous generation of refrigerant that is banned but can currently be imported pre-charged in equipment.

Consultation process

How we consulted

From 8 November to 18 December 2022, the Ministry consulted on proposed measures to reduce the environmental impact of F-gases through a regulated refrigerant stewardship scheme and prohibitions on the import and sale of equipment pre-charged with HFCs.[1]

View the 2022 consultation .

Consultation tools

Submitters gave feedback through two channels.

- Online submissions, which asked various questions, including some specific to business and industry.
- Via email to the Ministry.

Who responded

Although the response was relatively small (38 submissions), a good cross-section of submissions were received from potentially affected businesses, individuals, environmental and community groups, and local government agencies (see table 3).

Table 3: Type and number of submissions

Submitter type	Number
Individual	14
Business and industry	13
Industry association	7
Local government	2
Other organisation	2
Total	**38**

Submitter comments

Comments from submitters are included throughout this summary. Footnotes state the name of submitters who consented for their comments to be published.

Some comments are not footnoted, either for brevity, because they are paraphrased or because the organisation or individual chose to remain anonymous.

[1] Ministry for the Environment. 2021. *Ngā waeture tiaki rawa kua takoto i konei: Ngā taea me ngā pūhiko kaitā | Proposed product stewardship regulations: Tyres and large batteries*. Wellington: Ministry for the Environment.

Quantifying submitters

When referring to submitters, the document quantifies support based on the classifications in table 4. The wording classification is proportionate to the number of responses received to the question.

Table 4: Submitter quantification terms used in the document

Classification	Definition
Few	Fewer than 5% of submitters on this topic
Some	5–25% of submitters on this topic
Many	26–50% of submitters on this topic
Most	More than 50% of submitters on this topic
All	100% of submitters on this topic

Next steps and policy decisions

Publishing submissions

Alongside the release and publication of this document, we will also publish and release submissions from those who agreed to publication. These will be available on the Ministry's website.

Policy decisions

The Ministry will provide advice to Ministers and Cabinet on next steps for F-gas product stewardship and prohibitions on pre-charged equipment. This will be based on insights gathered from this consultation process and other Ministry activities, such as engaging with stakeholders, consulting with various government agencies, studying international best practices, and ongoing work initiatives.

To stay up to date on any decisions and announcements, visit the Ministry for the Environment's waste page, Facebook or Instagram.

What we heard: Refrigerant scheme regulations

Regulatory framework

Synthetic refrigerants have been declared a priority product. A declaration requires development and accreditation of a product stewardship scheme for the product and opens the option to restrict sale of synthetic refrigerants to those who do so in accordance with the scheme. Other product regulations under the WMA are also available for both priority and non-priority products.

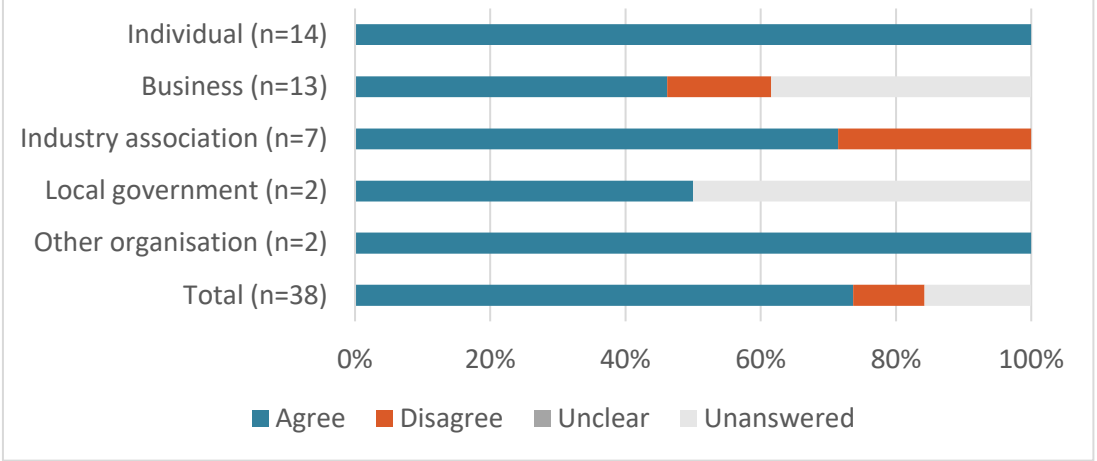
In this consultation, submitters were asked whether they supported in principle such a regulated framework for refrigerants.

There was strong support in principle for a regulatory framework for refrigerants, from:

- 88 per cent of submitters who answered the question
- 74 per cent of total submitters.

Some submitters did not answer the question (8 per cent) or disagreed with the proposal (2 per cent). Support for the framework was strongest among individuals and 'other organisations' (figure 1).

Figure 1: Support in principle for a regulated framework



Question asked in consultation *Proposed measures to reduce the environmental impact of fluorinated gases* was "Do you agree in principle that a regulated framework should be introduced to ensure effective product stewardship for synthetic refrigerants?".

Comments and suggestions

Reasons given by submitters for their support mostly echoed the consultation document.

Product stewardship shifts costs to producers

Four submitters, including one local government, noted that regulated product stewardship would shift costs to producers. Two of these submitters noted that they thought the responsibility for managing the environmental impact of the products should fall to producers and industry.

Every party should be responsible

Five submitters noted that every party should be responsible for the environmental impact of the products. One of these submitters noted that the proposal will ensure all industry players bear the same costs and restrictions.[2] Another submitter noted:

> Regulating these activities ensures a level playing field for the market and does not give a competitive advantage to participants doing the wrong thing.[3]

Other key themes

Two submitters supported the proposal but recommended the scheme should be expanded to capture more products. One of these submitters said the scheme should capture e-waste,[4] and the other submitter said the scheme would benefit from being extended to all refrigerants.

A few submitters suggested that other regulatory frameworks be used, instead of the WMA, to control management of F-gases.[5] One submitter suggested that the Ozone Layer Protection Act 1996 should be the basis for licensing technicians to operate on refrigerant-containing equipment.

Reasons for opposing the proposal

Four submitters, including two businesses and two industry associations, did not support the proposal. Their concerns included the following.

- The large product range and various industry sectors make it difficult to develop an equitable system.[6]
- One submitter recommended regulating refrigerants under the Climate Change Response Act 2022. They noted that refrigerants are being regulated as an end-of-life product rather than being regulated based on their GWP level.[7]

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2 Chemiplas NZ Ltd.

3 Anonymous other organisation.

4 WasteMINZ Product Stewardship Sector Group.

5 IHRACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations), Zero Carbon Tasman Inc, New Zealand Heat Pump Suppliers Association.

6 Motor Industry Association.

7 IHRACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations).

Sale in accordance with an accredited scheme

Once a product has been declared a priority, the Minister can recommend a regulation under WMA section 22(1)(a) to prohibit the sale of a priority product except in accordance with an accredited scheme. This regulation requires parties involved at the point of sale (eg, importers, retailers) to participate in an accredited scheme.

The consultation sought public feedback on whether to introduce this regulation for synthetic refrigerants, now they have been declared a priority product.

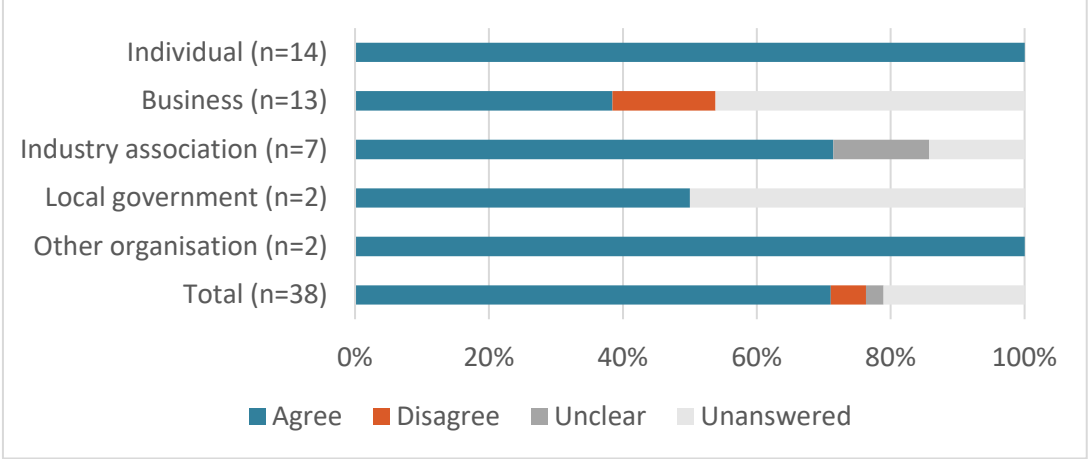
There was strong support for requiring the sale of synthetic refrigerants to be in accordance with an accredited scheme, from:

- 73 per cent of submitters who answered the question
- 71 per cent of total submitters.

Support was strongest among local government, individuals, business and industry (see figure 2).

A minority did not answer the question (12 per cent) or did not agree with the proposal (1 per cent).

Figure 2: Support for sale only in accordance with an accredited scheme



Question asked in consultation *Proposed measures to reduce the environmental impact of fluorinated gases* was "Do you agree with the proposal to make it mandatory to sell a product only in accordance with an accredited scheme for synthetic refrigerants?".

Comments and suggestions

Twenty-eight submitters supported the proposal. The main themes of comments and suggestions echoed the arguments provided in the consultation paper.

Need to regulate the synthetic refrigerants market

Five submitters noted that Aotearoa needs to regulate the synthetic refrigerants market for various reasons, such as reducing risk of environmental harm. One submitter noted:

> We do not want to see New Zealand become a dumping ground for products with a higher environmental impact. Regulations are already in place or are being put in place globally. We need to create a level playing field.[8]

The sulphur hexafluoride (SF_6) industry recommended that SF_6 should be monitored throughout the lifecycle, and recovering SF_6 should be mandatory at the end-of-life stage. These representatives noted that many switchgear systems,[9] used to de-energise charged electrical equipment using SF_6, were first introduced in the 1980s and have a 40-year lifecycle, so a large number will soon expire.

Two submitters noted that regulations are required to ensure the scheme's impact is not limited by lack of industry participation.[10] Another submitter noted full compliance is essential to cut emissions.[11] One submitter noted that accreditation will result in sellers and buyers being fully informed, and another submitter noted that accreditation removes the opportunity to game the system for gain.

Other submitters supported the proposal because:

- they thought the voluntary scheme has not worked to date[12]
- they consider it beneficial to have refrigerant sales controlled through product stewardship[13]
- unregulated producers and retailers could enter the market if product stewardship is not mandatory.[14]

Sixteen submitters who supported the proposals shared both suggested changes and concerns. Submitters noted that it is important everyone is aware of and complies with their obligations. One submitter noted that:

> …we need certainty that all users/buyers are informed of their obligations and willing to participate to maximise involvement.[15]

An important theme raised was that Aotearoa has no market influence over overseas manufacturers, so the Government must allow enough flexibility in the scheme to adapt to overseas trends.

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8 Anonymous other organisation.

9 Switchgear systems are electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment.

10 The Trust for the Destruction of Synthetic Refrigerants; anonymous individual submitter.

11 Zero Carbon Nelson Tasman Inc.

12 Anonymous individual submitter.

13 Anonymous business.

14 Patricia Scott.

15 Chemiplas NZ Ltd.

Submitters also noted that:

- the scheme should cover equipment maintenance and checking for refrigerant leaks
- suppliers of equipment are not keeping installers informed about good practice on refrigerants or encouraging them to use products with low GWP
- there should be obligations on owners of equipment not just those who maintain them.

Two industry submitters did not agree with the proposal to require sale of refrigerants to be in accordance with an accredited scheme.

One submitter noted that refrigerants had not been declared as a priority product when the co-design work was undertaken, so there was minimal impact or engagement from industry. This same submitter did not agree that membership should be required of anybody to be able to purchase refrigerant.

Scheme funding

The consultation sought public input on whether the regulated synthetic refrigerant scheme should be funded in the first years through New Zealand Units (NZUs), while longer-term funding options are developed and consulted on. NZUs are earned under the New Zealand Emissions Trading Scheme (NZ ETS) by the Trust for the Destruction of Synthetic Refrigerants (the Trust).

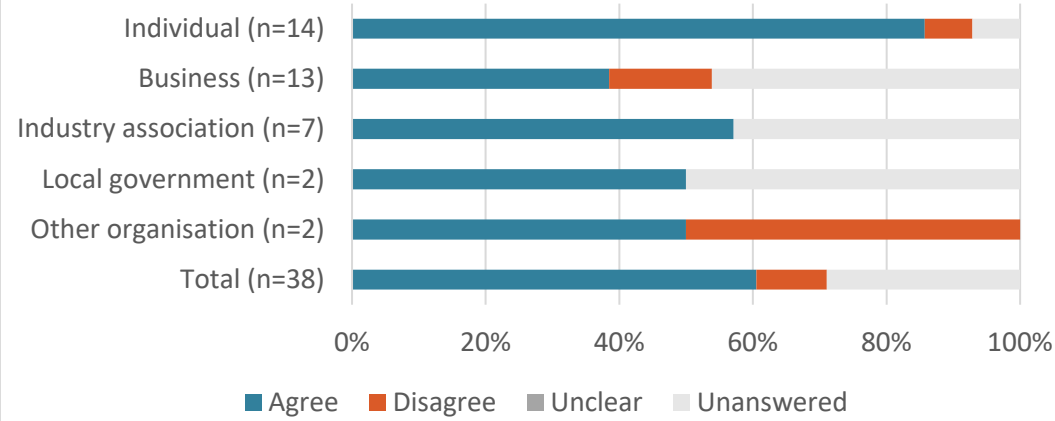
The longer-term funding options discussed in the consultation included a fee set under section 23(1)(d) of the WMA. The fee would cover services provided by an accredited product stewardship scheme for synthetic refrigerants. A levy was not suggested as an option because it is not available under the WMA.

There was strong support in principle for the proposal on how the scheme will be funded from:

- 85 per cent of submitters who answered the question
- 61 per cent of total submitters.

Support was strongest amongst individuals and industry associations (figure 3). A minority did not answer the question (29 per cent) or did not agree with the proposal (11 per cent).

Figure 3: Support for interim funding of a regulated scheme through New Zealand Units earned under the New Zealand Emissions Trading Scheme



Question asked in consultation *Proposed measures to reduce the environmental impact of fluorinated gases* was "Do you agree in principle that a regulated refrigerant scheme should be funded in the first years through New Zealand Units earned under the New Zealand Emissions Trading Scheme by the Trust for the Destruction of Synthetic Refrigerants while longer-term funding options are developed and consulted on?".

Support for funding proposal

Most submitters agreed in principle with funding the regulated refrigerant scheme through NZUs earned under the NZ ETS in the short-term, while longer-term funding options are being developed and consulted on.

One industry association noted the scheme needs a sustainable and effective funding model.[16] This submitter challenged the assumption in the consultation document that the Trust for the Destruction of Synthetic Refrigerants can access the NZUs in the NZ ETS Registry account originally registered by Refrigerant Recovery New Zealand.[17]

Some submitters noted that the current source of funding for the scheme may be sufficient at present, but other sources of funding may be required in future.

> Ideally there would be dedicated funding from the outset, but this is an acceptable stopgap measure.[18]
>
> We think it important that the long-term viability of funding is robustly tested so that local authorities do not end up financing costs should other scheme funding mechanisms fail.[19]

16 IRHACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations).

17 IRHACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations).

18 Katia de Lu.

19 Auckland Council.

Some submitters suggested other funding methods, including:

- establishing a fund for the specific recovery and destruction of F-gases, while the use of these gases is phased down. This fund can be used when the volume available for recovery is too low to be commercially viable, once refrigerants become a legacy product[20]
- using the funds generated through NZ ETS levies and NZUs gained from refrigerant removal, collection and destruction activities to fund the scheme for refrigerants[21]
- considering setting an advanced disposal fee to fund the scheme after the scheme is implemented[22]
- exploring newer funding methods if the current funding is exhausted in the future.[23]

One submitter supported CoolSafe's current approach of providing incentive payments for technicians to return refrigerant gases.[24]

Reasons for opposing the proposal

Four submitters did not agree in principle that, in the interim, the regulated refrigerant scheme should be funded in the first years through NZUs earned under the NZ ETS by the Trust, until longer-term funding options are developed and consulted on.

One organisation noted that funding the scheme through NZUs is administratively complex.[25] One industry submitter questioned why the collection of the destruction levy was paused, because it could have provided funding for training and provisions for cylinders, especially when there was a shortage of cylinders in 2018–19 and no way for recovered refrigerant to be collected.[26]

Scheme targets and reporting

The consultation sought public feedback on setting and enforcing targets for the accredited scheme, including for the:

- recovery and destruction of F-gases
- phase in of a comprehensive workforce competence recognition framework

There was strong support in principle for setting targets for the recovery and destruction of F-gases and the phase in of a workforce competence recognition framework from:

- 96 per cent of submitters who answered the question
- 63 per cent of total submitters.

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20 IRHACE, CCCANZ, RLNZ, RRNZ, and RRO (the industry associations).

21 Anonymous business.

22 Auckland Council.

23 Anonymous business.

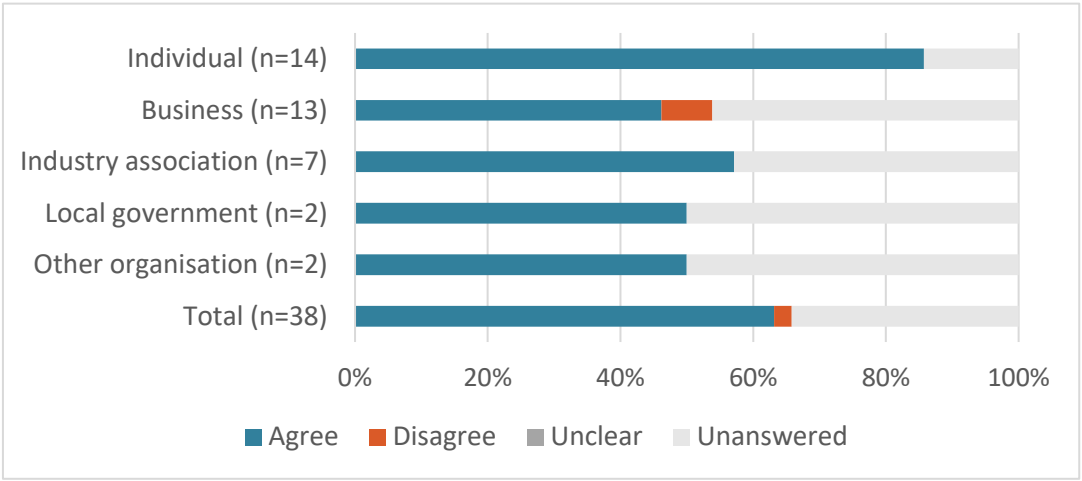
24 Anonymous business.

25 Zero Carbon Nelson Tasman Inc.

26 Anonymous business.

A minority of submitters (34 per cent) did not answer the question or did not agree with the proposal (3 per cent) (figure 4).

Figure 4: Support for setting targets for accredited scheme



Question asked in consultation *Proposed measures to reduce the environmental impact of fluorinated gases* was "Do you agree in principle that a regulated refrigerant stewardship scheme should be required to meet and report on specified targets for: (a) recovery and destruction of high global warming potential refrigerants? (b) phase-in of a comprehensive workforce competence recognition framework?".

Support for targets

Twenty-two submitters agreed in principle to setting targets for the accredited scheme. The proposed targets were generally seen as ambitious but achievable.

Some submitters emphasised the importance of setting challenging but realistic targets to drive progress. One individual suggested acting with ambition for the benefit of future generations.[27] Another submitter commented:

> Any scheme of this size should have to report against targets so that it is clear it is effective.[28]

Some submitters suggested other targets, including:

- reporting on refrigerant type and quantity[29]
- aligning with international standards for recovery targets.[30]

One submitter, who agreed in principle with take-back and targets, did not recommend training as a target. This submitter expressed concern that the scheme should not be responsible for workforce competence training.

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27 Katia De Lu.

28 Anonymous business.

29 Three anonymous individual submitters.

30 Dave Nicholls.

One submitter, who also agreed in principle, expressed concerns about the data collection, suggesting that reporting needs to be designed in such a way that:

- the collection of data is not burdensome for the scheme participants and users
- the format is consistent with existing reporting frameworks to avoid duplication or conflict with baseline and mass balance data.[31]

Comments and suggestions

Four submitters suggested other targets should be included. The main themes of the suggestions were as follows.

- **Targets and assessment:** Two submitters emphasised the need to set targets and conduct ongoing assessments to measure the effectiveness and accessibility of the proposed scheme.[32]
- **Reporting requirements and targets:** One submitter supported the proposal of reporting requirements and targets that use a chain-of-custody approach to monitor onshore and offshore material processing and harm reduction. This submitter also supported the proposal to include public reporting.[33]
- **Increased reporting from industry**: One submitter considered that measuring and reporting performance by the industry sector will be important in the future. They also noted that collection rates need to be improved for the automotive sector, particularly for automotive dismantlers, where negligible volumes are currently collected.[34]

Reasons for opposing the proposal

One submitter did not agree with the proposal to set targets for the recovery and destruction of high-GWP potential refrigerants and the phase in of a workforce competence framework. This submitter questioned the data used to calculate the refrigerant recovery rate and noted that the accredited scheme should aim to collect and destroy all refrigerants at end of life.

Quality standards

The consultation sought public feedback on quality standards to minimise refrigerant leaks in the refrigerant recovery and disposal process:

- restricting the recycling of synthetic refrigerants to plant with documented leak-testing and repair protocols
- ensuring the disposal of synthetic refrigerants is through full destruction.

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31 The Trust for the Destruction of Synthetic Refrigerants.

32 Zero Carbon Nelson Tasman; anonymous individual submitter.

33 Auckland Council; WasteMINZ Product Stewardship Sector Group.

34 Dave Nicholls.

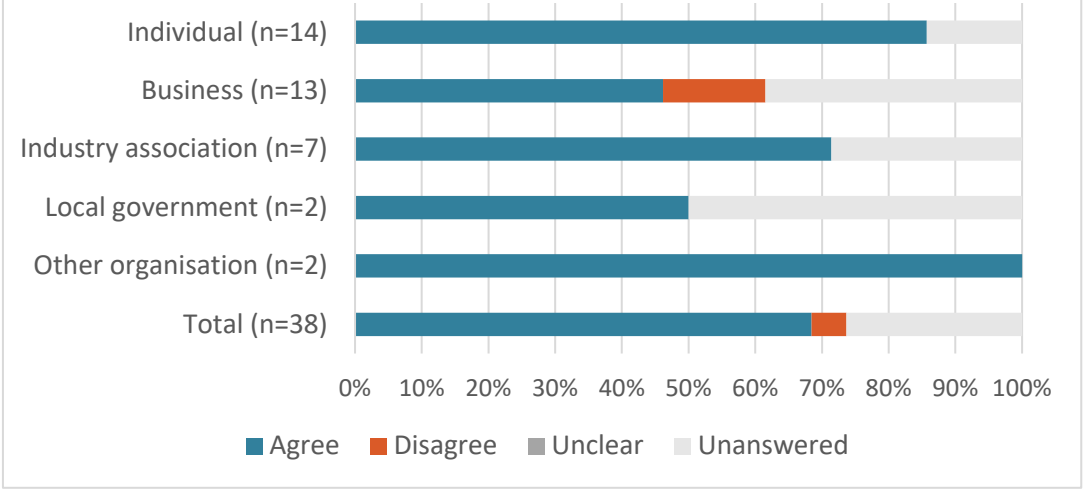
Quality standards for disposal

Most submitters supported the proposed quality standards for the decommissioning, dismantling or degassing (disposal) of refrigerants and F-gases, including:

- 93 per cent of those who answered the question
- 71 per cent of total submitters.

Support was highest among individuals (figure 5).

Figure 5: Support for quality standards for disposal



Question asked in consultation *Proposed measures to reduce the environmental impact of fluorinated gases* was "Do you agree that any person whose business is or includes the decommissioning, dismantling or degassing of any equipment containing or designed to use controlled substances, or any representative of such persons, be required to ensure that disposal of F-gases or other synthetic greenhouse gases is through full destruction (eg, plasma arc plant) or recycled into plant with documented leak-testing and repair protocols, never by release to the air?".

Submitter views on quality standards for disposal

Twenty-seven submitters supported the proposed quality standards. Of these submitters, five noted that the standards would prevent leakage. Four submitters had other reasons for their support, including:

- to encourage recycling within the scheme[35]
- to promote verified reuse at the required standard.[36]

In addition, four submitters commented that there should be mandatory reporting requirements to support these quality standards.

[35] Anonymous individual submitter.

[36] A-Gas NZ Ltd.

Two submitters did not support the quality standards.

- One submitter noted that the collector should not be responsible.
- One submitter requested a threshold consistent with the European Union requirements, to avoid disproportionate effects.[37]

Quality standards for recycling of refrigerants

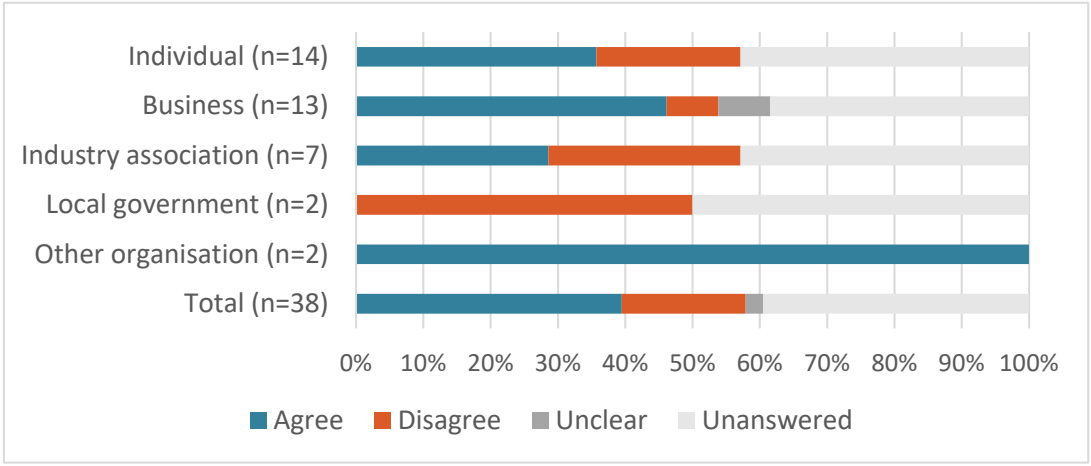
Most submitters supported the proposed quality standards for the recycling of refrigerants and F-gases, including:

- 65 per cent of those who answered the question
- 39 per cent of total submitters.

Eleven submitters supported the proposed quality standards, and six submitters supported them with reservations. Seven submitters did not support them.

Support was highest among individuals followed by other organisations (figure 6).

Figure 6: Support for allowing the reuse and recycling of fluorinated gases under a quality standard



Question asked in consultation *Proposed measures to reduce the environmental impact of fluorinated gases* was "Do you think that recycling of F-gases into other heating, ventilation, air conditioning and refrigeration applications (domestic use or exported) should be allowed under such a quality standard?".

Some submitters gave reasons for their support, including that the early destruction of resources should be avoided.[38]

One submitter noted that reporting requirements must be robust, to prevent the reuse of high-GWP refrigerants:

> Greater visibility of F-gas transactions coupled with standardised maintenance will do more to reduce leakage than anything else.[39]

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37 Siemens Ltd.

38 Anonymous business.

39 IRHACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations).

One submitter who supported the reuse of refrigerants noted that leakage rates should be targeted and operators and technicians should adopt best practice leak-monitoring and repair practices.[40]

Opposition and uncertainty about the proposed quality standards

The seven submitters who did not support the proposed quality standards for recycling noted that recycling and reuse would not minimise environmental harm. Of these, three submitters supported recycling and reuse in the future, but only after existing high-GWP refrigerants and F-gases are phased out. One submitter noted:

> Destruction should be promoted until such time as the bank of refrigerants [have] transitioned to predominantly lower global warming potential (GWP) refrigerants. At that point … 'reuse and recycling' should be the preferred option of any scheme.[41]

Three submitters noted that the proposed quality standards for recycling would not reduce environmental harm.[42] One submitter noted this would delay the transition to alternative, lower-GWP options, and another submitter noted that destruction should be the preferred option for high-GWP refrigerants.

Some individuals and industry members made comments about whether high-GWP refrigerants and F-gases should be allowed to be recycled or reused.

- One industry member suggested a 'phased' approach that would "[allow] the industry to gradually transition to lower-GWP alternatives, rather than driving rapid reductions in HFC use [which] could have negative [environmental] consequences".[43]
- One individual suggested that reprocessing of certain F-gases into lower-GWP versions should be possible under the scheme because this "reduces [environmental] harm in [some] equipment by 65% with or without leak testing".[44]

A few submitters made comments on the reuse and recycling of refrigerants in the context of the wider lifecycle of the product.

- One industry association commented that most environmental issues with F-gases occur earlier than destruction and recovery. They noted that environmental issues occur because of "substandard installations, poor maintenance and illegal discharges".[45]
- One industry association[46] and one local government submitter suggested tracking products containing F-gases throughout their lifecycle:

  > …the single greatest benefit [of] a well-designed … scheme is the … greater visibility of F-gas transactions throughout the supply chain … to identify where leakage is occurring [and] tracking technician certification.[47]

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40 A-Gas NZ Ltd.

41 The Trust for the Destruction of Synthetic Refrigerants.

42 Auckland Council; Trust for the Destruction of Synthetic Refrigerants; WasteMINZ Product Stewardship Sector Group.

43 Anonymous business.

44 Anonymous business.

45 IRHACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations).

46 IRHACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations).

47 IRHACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations).

Suggested quality standards for reuse, recycling or recovery

Eight submitters suggested specific quality standards, as outlined in table 5.

Table 5: Proposed quality standards for reuse, recycling or recovery of refrigerants

Proposed standard	Description
AS/NZS 5149.4:2016	Provides requirements for the operation, maintenance and repair of refrigerants and systems that are designed to minimise injuries to people and damage to property and the environment resulting from the improper handling of refrigerants.
AHRI 700 (2019); 700D (2012) and 700C (2008)	Specify acceptable levels of contaminants (purity requirements) for fluorocarbon, hydrocarbon, and carbon dioxide refrigerants regardless of source, and list acceptable test methods.
IEC 60480:2019	Provides criteria for the reuse of sulphur hexafluoride and its mixtures after recovery and reclaiming from electrical equipment (eg, for maintenance or at the end of life).
IEC 60375:2018	Specifies the rules for signs and reference directions and reference polarities for electric currents and voltages in electric networks.
IEC 62271-4:2022	Applies to the procedures for handling of gases for insulation and/or switching during installation, commissioning, repair, overhaul, normal and abnormal operations and disposal of electric power equipment at the end of its life.

One submitter supported the AHRI standard and noted that:

> …the AHRI Standard is a universally recognised standard for refrigerants and ensures that the refrigerants are fit for purpose … and will not result in higher indirect emissions (higher energy usage due to compressor inefficiency).[48]

One submitter suggested aligning the standards for ozone-depleting and high-GWP refrigerants with the hazardous refrigerants regulated by WorkSafe New Zealand.[49] Another submitter suggested the European Union F-gas maintenance requirements.[50]

Workforce competencies

The proposed workforce competencies would require people involved with their sale and management to demonstrate an appropriate level of competence to handle refrigerants, which will minimise the risk of environmental harm.

New requirements under Ozone Layer Protection Act 1996

Most submitters supported the proposed quality standards and workforce competencies for businesses that install, service, modify or dismantle products containing refrigerants, under section 11 and section 16 of the Ozone Layer Protection Act 1996.

Twenty-one submitters supported the proposed measures:

- 89 per cent of those who answered the question
- 60 per cent of total submitters.

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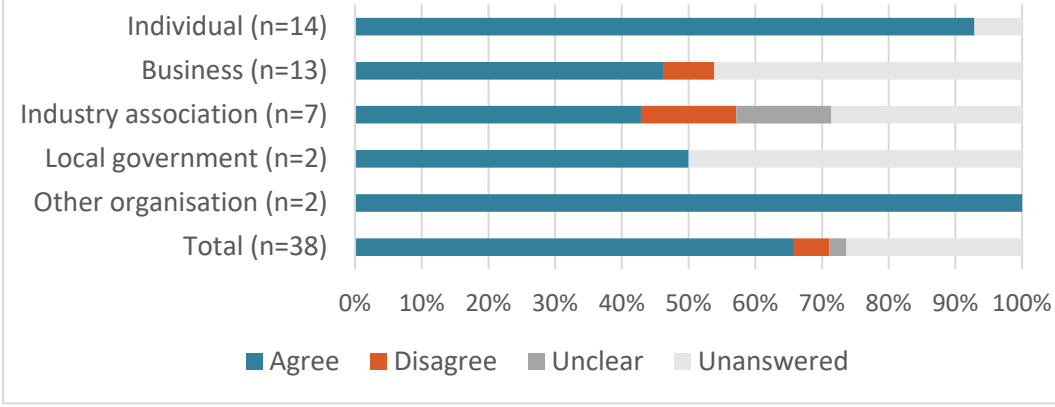
[48] A-Gas NZ Ltd.

[49] Anonymous individual submitter.

[50] Anonymous individual submitter.

Support was highest among individuals, at 54 per cent (figure 7).

Figure 7: Support for workforce competencies



Question asked in consultation *Proposed measures to reduce the environmental impact of fluorinated gases* was "Do you agree with the proposal to require businesses that install, service, modify or dismantle any equipment containing or designed to use any controlled substance that is a refrigerant, or the direct handling of these substances involving a possible risk of their release into the atmosphere, to: (a) register with the accredited refrigerant stewardship scheme and (b) demonstrate that employees have the appropriate competence recognised by that scheme for their work, under a new regulation using section 11 and section 16 of the Ozone Layer Protection Act 1996?".

Of the submitters who supported the proposed workforce competencies for installation, five noted this would minimise leaks and environmental harm. One submitter noted that:

> Through [these measures] we can reduce the harm synthetic refrigerants can cause, making a positive contribution to New Zealand's climate change commitments.[51]

Two submitters commented that the proposal would make the industry fairer by ensuring industry follows the same rules. One submitter noted that:

> Regulation will provide the platform for a consistent and level operational and compliance environment.[52]

Four submitters supported the proposal but had concerns, including about the proposed four-year period for demonstrating competency and the reporting and verification process. One submitter noted that increased efforts will have to be planned for in the energy grid extension plans and by the utilities.[53]

Three submitters did not support the proposed workforce competencies under the Ozone Layer Protection Act 1996. One submitter expressed concern about a lack of knowledge about the scheme's design and impacts on businesses.[54]

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[51] The Trust for the Destruction of Synthetic Refrigerants.

[52] Anonymous business.

[53] Siemens Ltd.

[54] Anonymous business.

Two submitters were unclear about whether they supported these measures. One felt that qualifications should be handled by a separate entity, outside of registration with the product stewardship organisation (PSO).[55]

Restriction on purchase of refrigerants

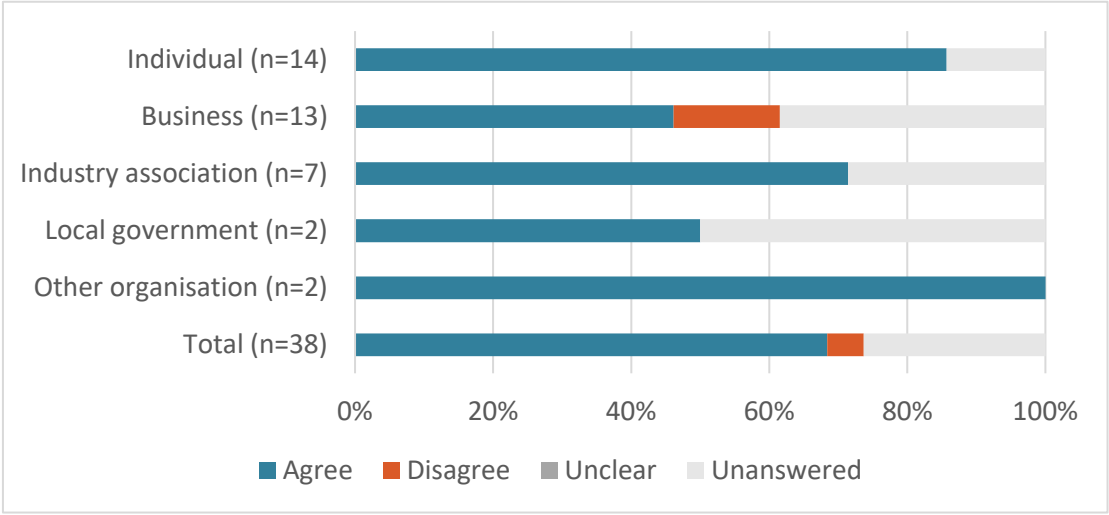
Most submitters agreed that the sale of F-gases should be restricted to competent individuals or companies under section 23(1)(b) of the WMA:

- 86 per cent of those who answered the question
- 62 per cent of total submitters.

Twenty-seven submitters supported the proposal to restrict the sale of these products to competent individuals and companies. Three did not support the proposal.

Support was highest among individuals (figure 8).[56]

Figure 8: Support for restricting sale of fluorinated gases to scheme participants and qualified technicians



Question asked in consultation *Proposed measures to reduce the environmental impact of fluorinated gases* was "Do you agree with the proposal to restrict sales of F-gases, in bulk, pre-charged units or products, to companies that are registered with an accredited scheme or an individual who can demonstrate appropriate competence recognised by an accredited scheme under section 23(1)(b) of the Waste Minimisation Act 2008?".

The main reasons for submitter support include the following.

- Four submitters supported the proposed workforce competencies, due to the high environmental harm from F-gases.
- Two submitters noted that requiring these competencies would minimise leakage risk.

[55] Anonymous business.

[56] Fifty-two per cent of submitters who supported the proposed workforce competencies for the sale of refrigerants and F-gases were individuals.

Of those who had concerns, one local government submitter noted that enforcement was difficult without product tracking. Two submitters noted that the proposal does not capture all actors in the supply chain:

> Some requirements should also extend to equipment owners to avoid establishment of an informal sector that acquires refrigerants from existing equipment.[57]

Two submitters noted that the sale of some refrigerants and F-gases (such as retail[58] and pre-charged units[59]) should be excluded, due to potentially low volumes and high political impacts.[60]

Other submitters were concerned that legacy products and other (related) priority products are not addressed by the proposal.[61]

The three submitters who did not support the proposal noted that:

- complexities exist with creating a process to manage a variety of customers, which has increased costs[62]
- licensing should be separate from the scheme manager[63]
- greater accountability is needed for a variety of actors both within and outside the refrigerant industry.[64]

It was unclear whether three other submitters supported the proposal. One local government submitter noted that the "seat of responsibility is not clear", further stating:

> …many customers and operators are still not aware of their obligations, and opportunities still exist for leakage of gases into the environment, particularly from members of the public who do not currently have an awareness of the issue, or incentives to follow through on recovery options.[65]

Restriction on end-of-life refrigerant management

Most submitters agreed that the disposal or recycling (management) of refrigerants should be restricted to competent businesses or individuals under section 23(1)(g) and (h) of the WMA:

- 86 per cent of those who answered the question
- 62 per cent of total submitters.

Twenty-five submitters supported the proposed workforce competencies for the disposal and recycling of refrigerants and F-gases. Three submitters did not support the proposed measures.

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57 Anonymous business.

58 Jason Quinn.

59 Imported Motor Vehicles Industry Association.

60 Jason Quinn.

61 WasteMINZ Product Stewardship Sector Group.

62 Anonymous business.

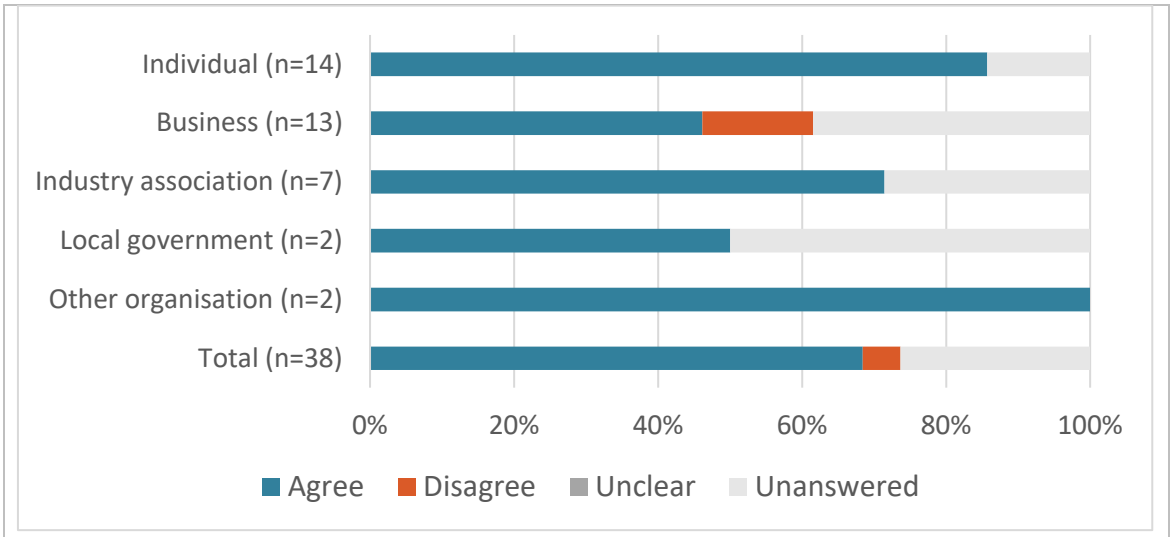
63 Anonymous business.

64 IRHACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations).

65 Auckland Council.

Support was highest among individuals (figure 9).[66]

Figure 9: Support for restricting the decommissioning, disposal and recycling of refrigerant-containing equipment to scheme participants and qualified technicians



Question asked in consultation *Proposed measures to reduce the environmental impact of fluorinated gases* was "Do you agree with the proposal to require businesses decommissioning, dismantling, disposing of or recycling equipment containing refrigerants or other synthetic greenhouse gases to register with an accredited refrigerant stewardship scheme and demonstrate appropriate competence recognised by the scheme under section 23(1)(g) and (h) of the Waste Minimisation Act 2008?".

Support for proposal

Of the submitters who supported the proposed measures, four noted the measures would minimise leaks. One submitter noted that "[t]hese processes need to be carefully managed to avoid leakage".[67]

Four submitters gave other reasons for their support, including:

- responsible parties will not be able to avoid the cost of appropriate disposal[68]
- without these requirements, some businesses are likely to "take advantage of not doing the right thing".[69]

One submitter expressed the importance of having a robust verification and reporting system to ensure consistency across the country in ensuring technicians are qualified. Another submitter noted there would be more benefits in improving marketing and communication, consumer education, and forming relationships with key stakeholders, compared with expanding workforce competency and registration.

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66 Fifty per cent of submitters who supported the proposed workforce competencies for the management of refrigerants and F-gases were individuals.

67 Anonymous individual.

68 Anonymous individual.

69 Anonymous business.

> Currently we understand there is no legal requirement for items to be degassed and some disposal operators (including councils) require this to be done before they accept them, and some don't.[70]

Two submitters had reservations about the proposed workforce competencies including:

- whether previous experience would be recognised
- about the additional cost of training employees.[71]

A few submitters also wanted more clarity about the effects of the proposed scheme design on businesses.

- One industry member did not support the requirement to register with an accredited scheme, because they did not know the scheme manager's objectives.
- Two submitters opposed or had reservations about the proposed quality standards and workforce competencies, due to the scheme manager's governance.[72]

Reasons for opposing the proposal

Three submitters did not support the proposed measures. One noted that registration would not be necessary if technicians already have the required level of competency. Workforce competency should also cover industries that interact with these products, such as construction.[73]

Benefits and costs: Workforce competencies

The Government sought feedback on the impact on businesses of the proposed quality standards and workforce competencies.

Twelve submitters noted benefits from the proposed workforce competencies.

Generally, submitters felt that these measures would improve the abilities of the refrigerant workforce and ensure requirements are consistent for all industry players. Of the submitters who outlined benefits, seven noted there would be minimal impact on their operations. Two submitters considered there would be:

- no impact as we are already selling to people who would be in the scheme already[74]
- minimal impact beyond maintaining current databases & requiring proof of competence from customers.[75]

One submitter noted that the proposal would improve standards across the industry, due to a "reduction in 'cheap' competition".

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70 Zero Carbon Nelson Tasman Inc.

71 The Trust for the Destruction of Synthetic Refrigerants; IRHACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations).

72 IRHACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations).

73 Anonymous business.

74 Anonymous business.

75 Anonymous business.

In contrast, eleven submitters noted that the proposed measures would have costs. Of these, five submitters noted that upskilling staff would have a cost, with one submitter commenting:

> I expect it would become near impossible to find adequately trained people [at least in] the 2–10yr timeframe.[76]

Five submitters provided examples of costs, including:

- the cost of storage and handling of waste-cooling equipment at transfer stations
- staff shortages that will lead to illegal dumping (cost to the environment)
- compliance costs
- impacts on customers
- re-training of staff if previous training is not recognised by the scheme.

One submitter noted that the scheme would have costs for their business due to subsequent impacts that need to be justified:

> Any measures that could put barriers between us and our customers will impact negatively on our business … the PSO [product stewardship organisation] [and the responsible government agencies must] actively engage in media campaigns explaining how and why these measures are being introduced. We cannot have the responsibility for justifying the scheme being left to the wholesalers.[77]

One submitter noted that:

- compliance costs will be minimised by building on existing qualification standards and training, and the PSO should support building competency across the industry.[78]

[76] Anonymous business.

[77] Dave Nicholls.

[78] The Trust for the Destruction of Synthetic Refrigerants.

What we heard: Scheme design and implementation

The consultation was on proposed regulations to support a product stewardship scheme for synthetic refrigerants and not the scheme design. However, the proposed scheme design was provided as an appendix to the consultation document as context for submitters because some proposed regulations would give effect to aspects of the scheme design.

Subsequently, some submitters have provided feedback on scheme design and implementation, including points that apply generically to product stewardship schemes and others specific to a scheme for refrigerants and F-gases.

Only one submitter disagreed with the proposed scheme design, noting that, in their view, frameworks and take-back services that match the scheme's ambitions already existed.[79]

Qualification frameworks

Five submitters made comments about the proposed qualification frameworks. A range of views was expressed about who should be responsible for this framework and what this involves.

- One business suggested a focus on basic worker safety and best practice, due to the replacement of F-gases with flammable hydrocarbons.[80]
- One business supported a comprehensive framework managed by the Government for all products containing F-gases.[81]
- Another business commented that certain aspects of qualification frameworks, such as licensing, should be conducted by a separate entity and not the PSO.[82]

Reporting requirements

Three submitters commented on the proposed reporting requirements.

- One local government submitter commented that it is good practice to report regularly on the amount of refrigerant purchased by an entity for the refill of equipment.[83]
- One individual suggested that the PSO should obtain permits for all participants' activities related to refrigerants and F-gases and report to the Government on these.
- One industry member recommended a built-in process for review and adjustment of the scheme's design.[84]

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79 Anonymous business.

80 Anonymous business.

81 Anonymous business.

82 Anonymous business.

83 Auckland Council.

84 Anonymous business.

Governance and transparency

Four submitters raised concerns over the proposed scheme's governance and whether the PSO would adequately represent sector interests.

- One industry member commented that the co-design process neglected the viewpoints of some major stakeholders.[85]
- One industry member commented that it was important for the scheme's success that the "industry-led representative body [PSO] can effectively meet the necessary criteria and has strong governance".[86]
- Two submitters did not support the proposed scheme's PSO, due to its governance structure.[87]

Some individuals, industry members and local government submitters suggested greater transparency for different aspects of the scheme design.

- One business commented that there was a lack of transparency regarding the PSO's governance.[88]
- One local government submitter commented there could be greater "transparency around how the [Synthetic Greenhouse Gas] Levy is spent [to fund the scheme], as this is not clear to industry".[89]
- One industry member commented that it is important for the PSO to be accountable to the industry and stakeholders.[90]

Scope of the scheme

Some individuals, industry members and local government submitters made comments about expanding or reducing the scope of the scheme.

Submissions suggesting an expanded scope

- One industry member suggested that equipment owners must be included in the scheme design to "avoid the establishment of an informal sector that acquires refrigerants from existing equipment".[91]
- One local government submitter commented that roadside dumping and demolition of buildings containing heating, ventilation, air-conditioning and refrigeration equipment are two examples of refrigerant and F-gas leakage that are not captured by the scheme.[92]

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85 Anonymous business.

86 Daikin Air Conditioning New Zealand Limited.

87 IRHACE, CCCANZ, RLNZ, RRNZ and RRO (the industry associations); anonymous business.

88 Anonymous business.

89 Auckland Council.

90 Anonymous business.

91 Anonymous business.

92 Auckland Council.

What we heard: Prohibitions

Twenty-one submitters provided feedback on the proposed prohibitions targeting the import and use of equipment pre-charged with HFC refrigerants.

Four submitters were supportive of the entire schedule of prohibitions, with some of them even recommending some prohibitions should be enacted sooner.

The remaining submitters showed varying degrees of agreement, either showing support or opposition (or both) for certain prohibitions but not all.

General issues that need consideration

Many submitters raised general issues that they felt should be considered when determining prohibition dates.

Five submitters felt too much uncertainty existed in the industry and that prohibitions for 2028 and 2032 were not practical. Three of these submitters suggested that prohibitions beyond 2025 be reviewed at a future point when more information is available.

- Two submitters felt that the 2025 dates were achievable, but the 2028 and 2032 prohibitions would be more difficult, especially in areas where technician licensing is required.
- One organisation stated that "there are several barriers like [polyfluorinated alkyl substances] and safety standards that the industry will need to overcome to clearly predict what will be the global direction in refrigerant developments".[93]
- One industry member, referring to an organisation's contribution to its submission, noted "the general feedback was – agree the targets for 2025, then review".[94]

Three submitters commented on the need for appropriate lead-in times for manufacturers.

- One industry member said that "meeting [the] requirement by 2025 across all small commercial air conditioning products will not be possible due to suitable components and design, test lab and manufacture lead times".[95]
- One industry submitter stated that "model planning and prototyping has already happened for 2026 models" and "model cycles are 4 to 5 years as all parts have to be designed, prototyped, made to production standard and then tested for prolonged periods, crash tested and possibly redesigned all over again prior to actual use in any production vehicle".[96]
- One industry organisation said that "the development of new equipment could take 3–4 years (from the time the ideal refrigerant is identified)".[97]

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93 Anonymous business.

94 The Trust for the Destruction of Synthetic Refrigerants.

95 Anonymous business.

96 Motor Industry Association.

97 Anonymous business.

Four submitters thought the proposed prohibitions needed to recognise energy efficiency issues.

- One industry submitter stated that, "for household and small commercial air conditioning these products are currently regulated by Minimum Energy Performance Standards" and "mandating a refrigerant with a GWP of less than 150 will increase energy consumption for this product category".[98]
- One industry submitter noted that "for refrigerant under GWP of 150, the alternatives are flammable refrigerant only and it has less efficiency on both heating and cooling".[99]
- Another industry submitter saw the decarbonisation of air conditioning as an important issue, stating that "heat pumps are projected to be instrumental in driving emissions down as the transition from gas occurs globally and the electricity grid is decarbonised".[100]

Five submitters had concerns about the safety of alternative refrigerants.

- In terms of air conditioners, one industry member stated that the "current and immediate future appliance safety standards limit application of highly flammable refrigerants to all but small air conditioners".[101]
- One industry submitter, in reference to a prohibition targeting passenger vehicles, said that "[the] dangers of flammable gas in populated enclosed space is significant and it is unlikely that any manufacturer will proceed in this timeframe".[102]
- One individual compared the current transition away from HFCs to the previous move from ozone-depleting refrigerants. They noted that the previous transition was less complex because the two refrigerant types had the same safety classification, which allowed for "drop-in" substitution in some cases.
- One submitter discussed the environmental concern of hydrofluoroolefins, noting that recent studies have suggested they degrade into polyfluorinated alkyl substances.

Specific prohibition timeline changes

Thirteen submitters were opposed to at least one aspect of the prohibition timeframe. Many provided comments on specific products and prohibitions.

The prohibition proposed on household refrigeration received no specific negative comments, and one industry organisation stated that "the targets for domestic refrigeration should be able to be fully met, given that the majority of quality household refrigeration units are already using <150 GWP refrigerant".[103]

Household air conditioning was a topic that attracted a lot of comments. Submitters were generally in favour of the proposed 2025 prohibition (750 GWP), with the stipulation that the category should be defined as "systems under 12kW capacity".

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98 Anonymous business.

99 Anonymous business.

100 Anonymous business.

101 Anonymous business.

102 Anonymous business.

103 The Trust for the Destruction of Synthetic Refrigerants.

- One industry organisation stated that "for comfort cooling R32 (GWP 677) provides the most energy efficient outcome".[104]
- One industry organisation agreed with the proposed 2025 prohibition on household air conditioners, but suggested "precision [is] needed on size. Suggest it applies to systems 12kw or smaller (this is consistent with the Australian Government)".[105]
- Conversely, one industry organisation said that meeting the requirements by 2025 across all small commercial air-conditioning products would be difficult due to the lead-in time issue mentioned above.

Several submitters disagreed with prohibitions on larger air-conditioning equipment.

- One individual felt the 750 GWP limit would be difficult to achieve by the 2025 date proposed.
- One industry submitter thought that safety standards may now allow a prohibition in this category.

Two industry organisations mentioned that there is no prospective low-GWP refrigerant for use in dehumidifiers.

- One industry organisation commented that "the dehumidifier market is insignificant in New Zealand. They may not be able to meet the <150GWP 2025 subject to manufacturing/technology restraints".[106]
- One industry submitter provided similar feedback, stating "there are no current plans to change refrigerant in dehumidifiers – a very small sector – [we] suggest delaying limits to 2025 to see approach followed".[107]

Vehicle air conditioning was also a topic of notable interest.

- One industry submitter felt that 2025 was too late for a 150 GWP limit on vehicle air conditioning, because "the technology exists and has been deployed internationally".[108]

However, other industry organisations disagreed strongly with the proposed prohibitions on vehicle air conditioners.

- One industry organisation said that vehicle source markets have only moved away from F-gas refrigerants recently and "a ban on importing products charged with F-gases in the proposed time frame will have a huge impact on the New Zealand consumer with consumers being unable to afford the later model vehicles"." They further stated that a prohibition "will not make a difference in the effort to reduce greenhouse gases, as other markets will take the vehicles that New Zealand (Inc) has banned".[109]

[104] Anonymous business.

[105] Anonymous business.

[106] Trust for the Destruction of Synthetic Refrigerants.

[107] Anonymous business.

[108] Anonymous business.

[109] Anonymous business.

- Another industry submitter shared similar views, stating that "while Japan is banning F-gases in automotive air conditioning from 2023, this only applies to vehicles manufactured for the domestic market, and not those built for some other markets, and indeed many Japanese models are not even made in Japan".[110]
- The same submitter also noted that, not only is Aotearoa New Zealand's car market small globally, "the vast majority of new vehicles – a little over 80% by volume – that land in New Zealand are built to Australian Design Rules (ADR) standards for the Australian market".[111]

Other prohibition timeline changes

Many submitters thought the category descriptions lacked definition.

- Six submitters felt the use of the terms 'small' and 'heavy' was not descriptive enough.
- Three submitters felt that, in some circumstances, 'household', 'commercial' and 'industrial' were not useful terms.
- Three submitters suggested that the wattage of equipment should be used in some cases.

Some submitters also described other products that they would like prohibited.

- Three submitters mentioned electrical switchgear containing SF_6.
- Two submitters mentioned the opportunity to ban non-refillable refrigerant cylinders.
- One submitter suggested a 'catch-all' category to ensure all equipment would eventually be targeted.

Prohibition on equipment containing ozone-depleting substances

Nineteen submitters provided feedback on whether a prohibition on equipment pre-charged with ozone-depleting refrigerants would affect consumers or the industry.

- Eight submitters stated there would be an impact, but most did not elaborate on what that impact would be.
- Nine submitters believed there would be no impact.
- Two submitters were unsure if there would be an effect.

Two submitters also mentioned the need for exclusions from a ban on ozone-depleting refrigerants.

- One individual mentioned exemption for goods intended for Pacific Island nations that might still be reliant on HFC refrigerant technology.
- One industry association stated that some classic cars still contain R12 refrigerant and may need to be excluded from a potential prohibition in a similar manner to their exclusion from other environmental regulations.

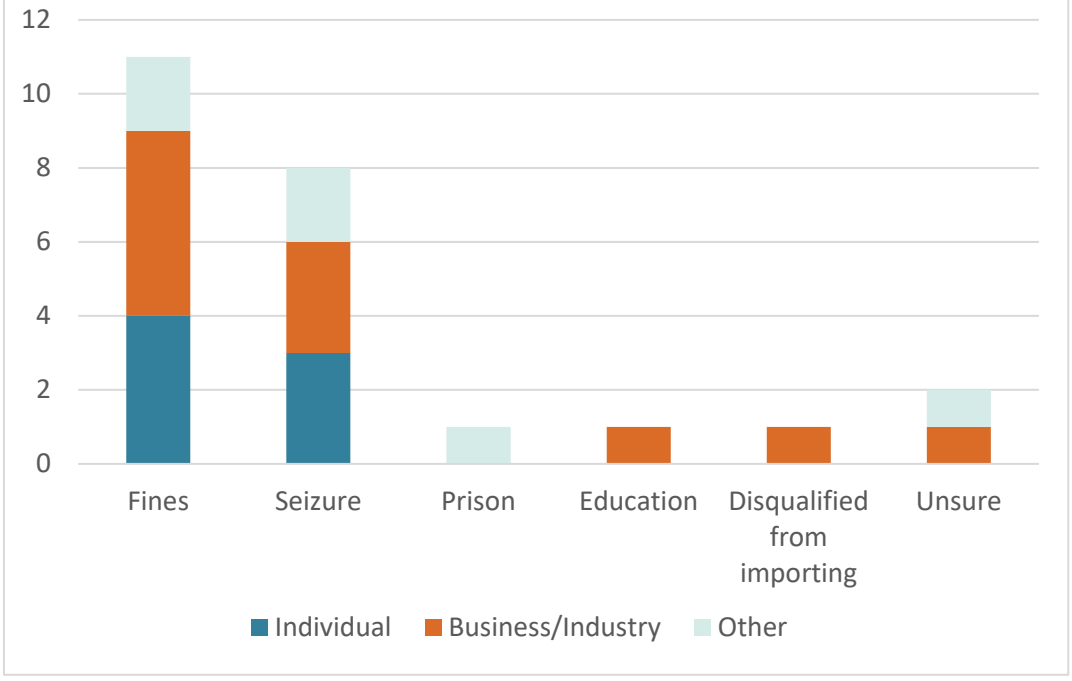
[110] Motor Industry Association.

[111] Motor Industry Association.

Controls

Thirteen submitters answered questions on what penalties they think should be in place when breaches occur of product prohibitions. The answers are summarised in figure 10.

Figure 10: Refrigerants – responses on proposed penalties for breaches of product prohibitions



Question asked in consultation *Proposed measures to reduce the environmental impact of fluorinated gases* was "What penalties should exist related to the import of pre-charged equipment (eg, fines, seizure of goods)?".

Supplementary Analysis Report: Regulations to support synthetic refrigerant product stewardship

Coversheet

Purpose of Document	
Decision sought/taken:	Analysis produced for Cabinet report-back on decision to introduce a regulated product stewardship scheme for synthetic refrigerants
Advising agencies:	The Ministry for the Environment
Proposing Ministers:	Hon Penny Simmonds
Date finalised:	20 May 2024

Problem Definition

Synthetic refrigerants pose a risk to the environment if the equipment containing them is not used correctly, or the refrigerant is not disposed of correctly. Operational errors, such as leaks and improper maintenance, can result in the release of gases into the environment that are either ozone depleting or greenhouse gases. To be disposed of properly, synthetic refrigerants need to be recaptured and then destroyed at high temperatures.

The existing regime has information and skill gaps and does not provide sufficient incentive or impetus for such emissions to be appropriately prevented, resulting in comparatively low recovery rates and costs to society and the environment. In addition, current government initiatives mainly target refrigerants early in their use cycle. The stock of refrigerants currently in use and in equipment at their end-of-life is given less consideration.

Insufficient action around leakage and end-of-life management of refrigerants would result in continued harm to the environment from release of gases into the environment, leading to economic costs of up to $437 million in the period to 2050.

Executive Summary

A regulated product stewardship scheme is proposed to ensure that synthetic refrigerants that are harmful to the environment when released are better managed, leading to lower emissions. The regulated scheme would replace an existing voluntary scheme, which has had limited success in raising the amount of refrigerant that is being recovered (estimated at 10 per cent annually), does not include all industry sectors, and has not been able to move beyond encouragement of adequate and enforceable industry training.

At present, there are an estimated 16,775 technicians who work on equipment containing synthetic refrigerants, with varying levels of training and experience. Apart from 'Approved Filler' certification, training is optional and there are no requirements for training on

environmental risks or potential risks to health and safety for alternative 'natural' refrigerants. Industry has highlighted that skill gaps increase the risk of harm.

Parties who cause costs to society and the environment typically do not face those costs themselves (i.e. there are costs to society from private actions). Parties are able to avoid costs because it is difficult to detect gas emissions (odourless and colourless), monitoring across the synthetic refrigerant supply chain is fragmented, and information on gas loss is not required to be collected or reported.

In 2020, the Associate Minister for the Environment declared synthetic refrigerants as a priority product. This declaration requires a product stewardship scheme to be developed and accredited as soon as practicable and opens the option of using a regulation to prohibit sale of refrigerant except in accordance with an accredited scheme. The Ministry assess whether the scheme is consistent with the Waste Minimisation Act[1] and provides advice to the Minister for decision on scheme accreditation.

Government intervention is needed to:

- Increase the volume of decommissioned synthetic refrigerant that is recovered annually for destruction.
- Lift the skills of those in the industry to reduce the potential for environmental harm when working with synthetic refrigerants.
- Shift costs from society and the environment to those whose decisions give rise to the costs, across the entire synthetic refrigerant supply chain.
- Set quality standards and improve data collection, monitoring and enforcement activities across the refrigerant industry.

Preferred option and consultation feedback

In 2023 Cabinet agreed to introduce a regulated product stewardship scheme for refrigerants. This option involves:

1. Prohibiting sale of synthetic refrigerant, except in accordance with an accredited scheme. This regulation requires importers and producers to participate in an accredited scheme and comply with its requirements.
2. Setting a quality standard for end-of-life synthetic refrigerant management, which would restrict the activity of recovering synthetic refrigerant to a qualified technician.
3. Restricting the purchase of synthetic refrigerant to a qualified technician. The accredited scheme run by a non-profit product stewardship organisation (PSO) would manage a national refrigerant technician certification database. The training and qualification requirements would be set by industry and certification would be done by training establishments for technicians that have met them.

[1] For priority products, this includes consistence with accreditation guidelines published by the Minister (https://gazette.govt.nz/notice/id/2020-go3342/).

4. Restricting the disposal of synthetic refrigerant to high temperature incineration or another method that ensures full destruction. The method has a minimum destruction and removal efficiency of 95 per cent for dilute sources and 99.99 per cent for concentrated sources.

5. Require the accredited scheme to provide a take-back and destruction service for synthetic refrigerants.

Proposals for regulations to support a product stewardship scheme for synthetic refrigerants were publicly consulted on from 8 November to 18 December 2022. Consultation feedback indicated wide support (87 per cent) to implement a regulated framework for priority product stewardship for synthetic refrigerants. Most submitters supported the proposed regulations including requiring industry to participate in an accredited scheme, and a requirement for the accredited scheme to provide a take-back for destruction service. Some stakeholders raised the following:

- The length of the commencement period for the quality standards, and whether the qualifications should be handled by an entity separate to the accredited scheme.
- Synthetic refrigerants should not be reused due to the risk of environmental harm from leakage.
- Proposed additional targets, such as the number of domestic cooling units sold and collected by the scheme; use a chain-of-custody approach to monitoring the onshore and offshore reduction of harm; and increased reporting from industry.

Following consultation, the Ministry changed the proposal relating to targets. Though supported by stakeholders, there is limited data at present to base targets on, and necessary improvements in both the take-back service and certification of the workforce would take up to five years. It is recommended target regulations are not set now but considered during a regulation review (if regulations are adopted).

Costs, benefits and impacts

Impacts were modelled with a five per cent discount rate out to 2050. Based on the preferred option, key impacts are:

- Technician training costs of $25 to $45 million
- PSO costs of $145 million to $181 million
- Regulator costs of $9 million
- Training provider costs of $11 to $20 million
- Emissions reduction benefits of $60 to $437 million

The relatively broad range of estimated benefits reflects the modelled calculation of synthetic refrigerant stocks and uncertainty in the estimated impact of the regulated scheme in terms of impact on refrigerant recovery. In a low policy impact scenario, incremental refrigerant recovery reaches a maximum of four percentage points above the status quo recovery. A high policy impact scenario sees incremental refrigerant recovery reach 23 percentage points above status quo levels.

Several impacts were not able to be monetised due to lack of data. These impacts include refrigerant companies' economic costs to comply with the scheme, cost savings from

better access to drop off locations, and the industry's productivity increases that may result from training. These non-monetised impacts may not be large. Published values for the cost of carbon and expression of refrigerant gases in CO_2 equivalents were used to calculate the main emissions-related benefits.

Implementation

Subject to Cabinet approval, the proposed regulations would be developed under sections 22 and 23 of the WMA. The Ministry would work with the Parliamentary Counsel Office to draft regulations and report back to Cabinet in 2024.

The proposed regulations would be introduced in two tranches:

- Tranche one regulations would establish the measure to enable mandatory participation in the scheme, keeping records of synthetic refrigerant-related activities, and disposal of refrigerant gas. Depending on Cabinet decisions and availability of the Parliamentary Counsel Office, these regulations could come into force as early as late 2024.
- Tranche two would come into effect three years after Tranche one. Tranche two would establish the regulations required to enforce the training and certification provisions. The three-year gap will enable industry and refrigerant technicians time to upskill, become certified, and manage any pressures on training providers that may occur.

Implementation Risks

Regulations have not previously been established for a synthetic refrigerant stewardship scheme. To mitigate this risk, the Ministry would monitor the efficacy of the accredited scheme and require the scheme to record, monitor and report its performance to the Ministry on a regular basis. Monitoring would include both financial and environmental performance.

There are risks associated with scheme administration under regulations. Risks include the PSO being ineffective, the unwillingness of industry to participate, scheme compliance and Ministry enforcement measures being insufficient, costs being greater than budgeted, and the compliance system not being ready for implementation. Determination of final scheme design, information and awareness campaigns, transparent processes and communications, and phased implementation are mitigation options.

Limitations and Constraints on Analysis

This analysis was severely constrained by the lack of data across the range of industries involved with synthetic refrigerants. The number of technicians working with refrigerants, technicians requiring training, existing synthetic refrigerants stock, how synthetic refrigerants are used across the supply chain, and the extent of synthetic refrigerants recovery are only able to be estimated by expert opinion or one-off commissioned reports. Furthermore, there are differences across overseas jurisdictions that make comparison with existing regulated frameworks difficult.

The most relevant data is not routinely collected, as there is no requirement or incentive to do so at present. In addition, some data is commercially sensitive. This limits the ability to firmly establish the magnitude of identified problems, and some of the root causes are

unable to be directly observed.

Data and evidence collected by an industry-led co-design group and insights from regulated schemes overseas were utilised, along with interviews with key industry players. This process provided some useful evidence to assess likely impacts and the overall nature of the problem, but validation of the information provided was challenging.

The impact estimates in the analysis are based on the best available information, rather than the best possible information, meaning there is unavoidable uncertainty. Industry stakeholders acknowledge the data-poor environment and expect the regulated scheme would provide the core of a solution.

Responsible Manager(s) (completed by relevant manager)
Shaun Lewis General Manager Waste Systems Ministry for the Environment *[Signature]* *[Date signed out]*

Quality Assurance (completed by QA panel)	
Reviewing Agency:	Ministry for the Environment
Panel Assessment & Comment:	A quality assurance panel with members from Ministry for the Environment's delegated Regulatory Impact Statement Review Panel has reviewed the Supplementary Analysis Report. The panel assessed this using assessment criteria (complete, convincing, clear & concise and consulted), for all relevant sections of the report. The panel considers that all its feedback was addressed and therefore it meets the Quality Assurance criteria.

Section 1: Diagnosing the policy problem

1. The following subsection summarises -the background to the synthetic refrigerants policy problem under the status quo.

Context of the policy problem

2. In 2020, the Associate Minister for the Environment declared refrigerants as a priority product. Refrigerants declared a priority product are all refrigerant gases (including SF6) used for heating, cooling and air conditioning that are:

   - Ozone depleting substances for the purposes of the Ozone Layer Protection Act 1996 (OLPA), for example, chlorofluorocarbons (CFCs).

- Synthetic greenhouse gases under the Climate Change Response Act 2002 (these are hydrofluorocarbons (HFC) and hydrochlorofluorocarbons (HCFCs)).[2]

3. Products are declared a priority because of:
   - The risk they pose to the environment when they become waste.
   - The benefits from reduction, reuse, recycling, or treatment are significant.
   - The product can be effectively managed under a product stewardship scheme.
4. The declaration also captures products containing these gases. However, the priority product declaration and refrigerant regulations do not capture natural refrigerants.
5. Emissions of synthetic refrigerants and other greenhouse gases contribute to climate change. Currently, HFCs contribute to approximately two per cent of New Zealand's annual greenhouse gas emissions.[3] Synthetic refrigerants can have high global warming potential (GWP), hundreds or thousands of times stronger than carbon dioxide (CO_2). For example, HFC-134a has a GWP 1,300 times that of carbon dioxide. These high GWPs are why reduction of synthetic refrigerant emissions can significantly impact the climate despite being emitted in low quantities.
6. Legacy gases such as HCFCs and CFC contained in equipment older than 20 years pose a risk to the ozone layer.
7. Refrigerants are not consumed through use. Emissions are largely a result of equipment leaking refrigerants and improper disposal of refrigerants or the equipment that contains them. To be disposed of properly, synthetic refrigerants need to be recaptured and then denatured at high temperatures.

The current policy setting

8. Mitigating environmental harm from synthetic refrigerants, including F-gases, is a target of several government initiatives that aim to reduce the contribution of synthetic refrigerants to New Zealand's greenhouse gas emissions. These initiatives include New Zealand's first Emissions Reduction Plan (ERP), the New Zealand Emissions Trading Scheme (ETS), the Synthetic Greenhouse Gas (SGG) Levy, the Waste Minimisation Act 2008 (WMA), and the Kigali Amendment to the Montreal Protocol. In addition, there is currently a voluntary product stewardship scheme in place.
9. Further details on the initiatives and the existing voluntary product stewardship scheme are contained in Appendix A. The key points are as follows:
   - The ERP includes an action to introduce a mandatory product stewardship scheme for refrigerants. This action includes contributing to training and qualification development for all refrigerant handlers.
   - The ERP notes that initiatives in the F-gas sector— the Kigali Amendment phasedowns, the ETS, the SGG levy, and mandatory product stewardship—are projected to reduce emissions by 0.1 to 0.5 Mt CO_2-e by 2025 and 0.1 to 3.2 CO_2-e

[2] New Zealand Government (2020), *Declaration of Priority Products Notice 2020*, accessed at: https://gazette.govt.nz/notice/id/2020-go3343

[3] Ministry for the Environment. (2022). *Aotearoa New Zealand's First Emissions Reduction Plan*.

by 2035.[4] These numbers are significantly below the ERP sub-target for F-gases of 5.8 Mt CO_2-e by 2025.

- Under the ETS, importers and manufacturers of HFCs are required to offset their emissions by obtaining New Zealand Units (NZUs). The Climate Change (Other Removal Activities) Regulations 2009 provides the ability to obtain NZUs for the export or destruction on HFCs. By doing so, these regulations provide monetary incentive to remove or destroy HFCs.
- The WMA provides a framework to accredit mandatory product stewardship schemes for products that have been listed as "priority products". Regulations can be made to control or prohibit the sale and disposal of priority products, require take-back services, set fees, require labelling of products, set quality standards, and impose information requirements.
- 'Waste' and 'disposal' are defined under the WMA such that the product stewardship regulatory options for gases are limited. The WMA has limited regulation making powers for imposing controls during the lifecycle of "use" of a product.
- In 2020, an industry-led co-design working party proposed a regulated scheme design, and recommended supporting regulations, targeting synthetic refrigerants including F-gases. The group recommended requirements for skills, widened coverage to other sectors using F-gases (e.g. automotive air conditioning and heat pumps), and the significant expansion of F-gas collection for destruction.
- In 2022, the Ministry consulted on proposed regulations to support a priority product stewardship scheme for refrigerants and other synthetic greenhouse gases based on the co-designed proposal.[5]
- An industry-led voluntary product stewardship scheme, now named CoolSafe, established a national system to collect and destroy synthetic refrigerants. This scheme was accredited by the Minister for the Environment under the WMA in 2010 and reaccredited in 2017. The volume of refrigerant collected for destruction (or reuse) to date under a voluntary scheme has been low compared to other jurisdictions such as Australia and the United Kingdom. CoolSafe actively promotes an industry code of good practice to reduce risks of harm from refrigerants.
- Industry participants consider that the current state of training is lagging. While technicians are able to complete a National Certificate, the only mandatory qualification is an approved filler training course to fill containers with gases under pressure. The approved filler course is a generic one-day training course not specific to the needs of refrigeration technicians.
- A total of 16,775 persons are estimated to work on equipment containing F-gases in both stationary and mobile applications in New Zealand. This group consists of

[4] Ibid

[5] Further details of the scheme design can be found in Appendix 2 of the public consultation document on proposed product stewardship regulations for F-gases Proposed measures to reduce the environmental impact of fluorinated gases: Consultation document | Ministry for the Environment

approved fillers, licensed electricians, automotive technicians, and those without formal training.

- Some technicians working on synthetic refrigerants have received informal training, equipment manufacturer approved workplace training, or overseas certification, though the exact number is unknown. The extent to which these forms of training have been updated for recent industry developments in equipment and available gases is also unknown.
- Appendix B lists other legislation that relates to refrigerant management, and Appendix C sets out the range of stakeholders.

How is the status quo expected to develop?

10. Under the status quo, a voluntary product stewardship scheme would continue to operate, and would continue initiatives to improve industry training, the introduction of a bounty to improve recovery rates, and the expansion of the number of collection sites. However, the scheme is unlikely to substantially increase coverage of the above initiatives under a voluntary scheme.
11. We are unclear whether the above actions were put in place in anticipation of regulations being made to support a product stewardship scheme, or if the scheme would have undertaken these actions irrespective of regulations. [6] Therefore, the expected development of the status quo is difficult to assess.
12. Cool-Safe has applied for accreditation as the priority product stewardship scheme for "refrigerants and other synthetic greenhouse gases". The proposed scheme follows the model co-designed by the Synthetic Refrigerant Stewardship Working Group (Working Group) in 2020. The application is under consideration by the Ministry for the Environment. The process involves independent review and the next step is advice to the Minister for the Environment for decision.
13. The existing voluntary accredited scheme has an estimated recovery rate of F-gases for destruction of 10 per cent of available gas for removal in 2024.[7] In October 2022, Cool-Safe started offering a "bounty" to partially offset the costs to the sector in collecting and delivering the gases to their collection sites.[8] Since the implementation of the bounty, there has been a reasonable increase in volumes collected by Cool-Safe, though the precise increase is commercially sensitive.
14. The Trust has started working to offer a workplace competence register for the sector that will cover both environmental and safety components.
15. The Trust's funding model changed in 2022. The original voluntary levy on bulk refrigerant importers has been replaced with the sale of NZU credits. Cool-Safe receives NZUs for HFCs and PFCs it collects and then exports. To date, these NZUs have largely been reserved. In recent years, these NZUs have significantly increased in market value and can be used to fund scheme activities. What happens in the

[6] In addition to commercial sensitivity, uncertainty around the precise design of the regulated scheme and what PSO initiatives are additional to or build on those currently in place restricts the ability to estimate how the status quo would develop in the absence of a regulated scheme.

[7] Verum Group (2023), MfE Projections Final, unpublished

[8] The bounty currently pays $25 per kilogram of refrigerant sent to Cool-Safe.

longer term is difficult to know, and alternative funding sources might be needed. The Ministry may consider setting a product stewardship fee to fund the scheme in future.

What is the policy problem or opportunity?

Refrigerants pose a risk to the environment, arising from a misalignment of private and social costs

16. Refrigerants can cause environmental harm if not used or disposed of correctly. For instance, HFCs are potent greenhouse gases that impact climate change, which threatens society with costly health and environmental impacts such as floods, wildfires, drought, and increasingly severe weather events.[9] Intentional venting of gases to the atmosphere is prohibited under the CCRA and OLPA, but industry sources indicate that such venting does occur. The lack of record-keeping requirements, monitoring and enforcement difficulties mean the current regime does not provide a strong deterrent.

17. Detection of wilful discharge is also difficult because of the odourless and colourless nature of the gases and the typically private spaces in which refrigerant work occurs. There has only been a single prosecution for intentional venting under the CCRA.

18. Refrigerants that are securely contained in an operating system do not harm the environment, however, operational errors such as leaks and improper maintenance can result in the release of harmful gases into the environment.[10] Refrigerant control through better management of equipment and recycling, recovery and safe end of life destruction is considered more effective at addressing global warming than any other initiative.[11]

19. At present, parties involved in refrigerant supply and use chains do not face all 'lifecycle costs.' Social costs (i.e. those costs that are not borne by any particular party or group) arise from leaks, inadequate or neglected equipment servicing, and intentional venting of gases into the environment. These social costs, commonly referred to as externalities, result in degradation of the ozone and increased GWP.

20. The existing product stewardship scheme provides a free disposal service for refrigerant. However, the cost of hiring a refrigerant technician to recover the refrigerant and transport it to a scheme drop-off location is a disincentive. Anecdotal evidence is that some may have let gases vent to atmosphere, rather than incur the costs of appropriate disposal, giving rise to social costs. The scheme has recently implemented a free courier service and bounty to reduce transport and other costs.

21. When an individual intentionally vents gases into the atmosphere they avoid the private costs of disposal (i.e. the cost to responsibly collect, transport and dispose of refrigerant gases). Venting in this way has a low probability of detection, and no particular body or company is directly harmed who would complain or insist on responsible disposal. As a result, society and the environment bear the costs of the private decision. Similarly, the private costs of adequate equipment servicing can be

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[9] US Environmental Protection Agency, accessed at https://www.epa.gov/climate-hfcs-reduction/hfc-allocation-nprm-frequently-asked-questions

[10] Maina and Huan, (2015)

[11] Project Drawdown, cited in Synthetic Refrigerant Stewardship Working Group (2019), Milestone 2: Report 1 – Critique existing system(s) including product regulations

ignored as the effects of such neglect accrue to society/the environment, rather than the supplier or user of such equipment.

22. In economic terms, there is a divergence between private and social costs. This divergence leads to increased risk of environmental harm compared to a situation where private and social costs are aligned (i.e. “internalising the externality”).

23. Data on leakage is not routinely collected. Key industry players highlighted the role that leaks play in the risk of environmental harm, however definitive estimates on the extent of leaks is not available.[12] One report provides some evidence of leakages of 10 per cent per annum from some systems and up to 30 per cent per annum for transport refrigeration or AC systems.[13] Another report indicated that around 8 per cent of relevant gases is released into the atmosphere annually, and of that total, around 72 per cent relates to leaks and equipment servicing.[14]

24. In addition, once products containing refrigerants have reached the end of their useful life, the decommissioning process can lead to emissions. Commissioned modelling estimated that for 2024, around 10 per cent of all HFCs retired were collected for destruction, with an additional 12 per cent recycled. The remaining 78 per cent is unaccounted for.

Current stewardship arrangements do not provide sufficient incentive or impetus to bring about desired change

25. Despite being in place (in some form) since 1993, the current voluntary product stewardship scheme has not resulted in noticeable changes in key metrics such as the rate of synthetic refrigerant recovery, or the proportion of the relevant workforce who are qualified to work with synthetic refrigerants.

26. New Zealand’s recapture of refrigerant is comparatively low. As noted, New Zealand has an estimated refrigerant recovery rate of 10 per cent in 2022.[15] To put this figure in context, Australia and the United Kingdom have estimated refrigerant recovery rates of between 52 to 65 per cent and 62 to 92 per cent respectively.[16][17]

27. Some caution is required when comparing figures as there is no universal definition for recovery rate. Some jurisdictions calculate recovery rate using a base measure of total recoverable gases. That is, the recovery rate excludes gases that have leaked or been released during their life, as opposed to the total volume of imported gases. This ‘gas recoverable’ approach raises the reported recovery rate relative to alternative measures (as these may account for around 10%-30% of supply). Nevertheless,

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[12] Synthetic Refrigerant Stewardship Working Group (2019), Milestone 2: Report 1 – Critique existing system(s) including product regulations

[13] Verum Group (2020), Projections of HFC stocks and emissions to 2050 in relation to key factors influencing HFC consumption

[14] Expert Group (2016) Hydrofluorocarbon Consumption in New Zealand, Report prepared for the Ministry for the Environment

[15] Verum Group (2023), MfE Projections Final, unpublished

[16] Refrigerant Reclaim Australia. (2021). *Potential Recovery | Refrigerant Reclaim Australia*. https://refrigerantreclaim.com.au/program-performance/potential-recovery/

[17] AHRI. (2016). *Review of Refrigerant Management Programs*. https://www.arctick.org/media/1176/ahri_8018_final_report.pdf

available evidence supports the view that rates of recovery in New Zealand lag the rest of the world.

28. The existing scheme's historic slow-moving and ineffectual performance is related to the lack of responsibility for social costs. Upgrades under the re-branded Cool-Safe scheme have started to address barriers to more effective product stewardship performance are in Table 1 below. Evidence of causes and effects is scarce, but we set out the logic with evidence of the collective effects provided above.

Table 1 Limitations of current (voluntary) scheme

Barrier	Effect
Players can easily 'opt out' and can gain financially from doing so.	Scheme participation and recovery rates are, and will likely, remain lower than optimal. Refrigerant gas collection is optional. No cost off-sets are available to technicians to collect and drop-off gases, though the introduction of a 'bounty' has reduced costs. The nature and volume of training undertaken is less than that required for appropriate handling and disposal of synthetic refrigerants.
Parties can avoid social costs and there is no incentive for parties to take account of the environmental costs of products at the end of their life.	Councils and end-users are left to cover the costs of disposal, meaning society collectively pays for the individual decisions of other parties.[18] De-gassing and responsible disposal of equipment attracts charges, which can readily be avoided.
No direct incentive exists to provide convenient methods of collection or to develop cost-minimising disposal services, and to achieve specified collection or recovery rates.	Lower recovery rates than international benchmarks, even after accounting for measurement differences. Inconvenient site locations hamper recovery and collection rates (under improvement in Cool-Safe scheme upgrades). Inconvenient and costly recovery systems encourage dumping of equipment, or illegal and environmentally harmful practices (e.g. releasing gases directly into the environment). Industry is not held accountable for environmental damage from refrigerant gases, making voluntary change unlikely.[19]

[18] No data is publicly available on the proportion of landfill volumes that are refrigerant-containing equipment.

[19] Confidential estimates of mass balance suggest that 'unaccounted for' gases (i.e. the volume of refrigerants not added to the estimated bank or known to be recovered or reused) could be substantial, potentially as much as half of the total gases imported annually. Validating this estimate is not possible. The sources are strongly of the view that mandated participation will greatly improve the ability to make more accurate estimates of relevant quantities.

Barrier	Effect
	Refrigerant replacement is cheaper than maintenance or repair in poorly service or faulty equipment, increasing the likelihood of continued leakage.
Ease of import for products that are hard to recycle or pose risk at end of life.	Any person can purchase and sell refrigerant gases with little concern for their treatment post-sale, though some suppliers have voluntarily placed restrictions on purchasers out of concern for the potential harm on industry reputation and the environment. Landfill can used as a disposal option for equipment containing refrigerants, resulting in higher landfill use than desired.
Poor information on product composition/potential risk to the environment.	Consumers are not well informed about the properties of the refrigerants used in household equipment, nor the need for reuse, recovery or reclaim possibilities for the refrigerant. Technicians also have knowledge gaps around the GWP of refrigerant gases.[20]
Available training is limited (i.e. does not necessarily involve environmental harm component) and largely optional (the only mandatory requirement is a one-day approved fillers course). **Training and competence is not prioritised.**	Skill gaps exist, leading to poor practice and insufficient focus given to potential environmental harm.

Unlike other contexts, refrigerant gases are not 'front-of-mind' for consumers or society in general, resulting in a lack of awareness of the GWP properties of refrigerants

29. The public does not understand the environmental risks associated with refrigerants used in cooling systems, or the alternative options or risks from improper management or disposal of systems they are in. Further, refrigerants are colourless and odourless, reducing visibility to consumers. As a result there is little pressure, be it public accountability or consumer demands, to ensure the proper management of refrigerant-containing equipment at the end of its life.

30. There is little human health risk from synthetic refrigerants and no visual component. While consumers might be aware of littering associated with equipment such as

[20] New Zealand evidence from the Working Group is supported by a survey undertaken overseas that finds technicians do not always have a complete understanding of how refrigerant gases contribute to climate change, and the role their individual behaviour and training plays; Martinho et al (2023) A Social Study of the Technicians Dealing With Refrigerant Gases: Diagnosis of the Behaviours, Knowledge, and Importance Attributed to the F-Gases. International Journal of Refrigeration, 146, pp. 341-348.

refrigerators being abandoned, there is extremely little awareness of the risk of environmental harm from refrigerant gas leakage. As a result, consumers have a reduced understanding or influence on end-of-life treatment of refrigerants.

31. A 2013 report commissioned by the Ministry for the Environment found that there was no specific data on the willingness-to-pay of importers, manufacturers, or consumers for 'recycling' of refrigerant gases at end of life in New Zealand or overseas. Only a general willingness-to-pay to reduce emissions was found.

32. In addition, there is also widespread international evidence of avoiding payment (e.g. for technicians to remove gases and arrange for disposal), for reasons unknown but likely to relate to uncertainty and unwillingness to pay for external effects.[21]

33. The report concludes that there are potential benefits in the product cycle that are not being internalised (i.e. private costs not incorporating social costs) – in relation to environmental harm, there is/are:

- Likely to be incomplete information, leading individuals to undervalue safe use and disposal
- Social costs to current and future generations, including irreversible effects.

Root causes

34. The root causes are both societal and sector based.

Social norms favour behaviour focussed on convenience, particularly for consumers

35. No New Zealand specific data is available on consumer attitudes to refrigerants. However, a Portuguese study investigated the link between environmental behaviours and risk perceptions of consumers in relation to refrigeration equipment. The study found that—despite considering climate change to be of high importance and refrigerant gases to pose a high risk to the environment—most consumers did not consider these gases in their refrigeration equipment purchase decision.[22]

36. Factors that are considered more important in the purchase decision include energy consumption, price, model features, brand, and noise. It follows that consumers who place a low priority on environmental concerns at the time of purchase would be very unlikely to prioritise the disposal of refrigerant gases at end-of-equipment-life. It is easier and less costly for consumers to receive information on the factors above than it is for safe disposal of refrigerants.

37. Furthermore, when consumers experienced refrigeration equipment malfunction, almost a third of those surveyed indicated that they bought new equipment, and the old one was taken by the seller.[23] Between two and seven per cent of consumers behaved in ways that would increase the risks to the environment: either attempting to repair the equipment at home, placing the item in storage at home, or leaving the equipment on the side of the road.

38. For pre-charged units (e.g. heat pumps, air conditioners), expert opinion in New Zealand is that when faced with the need to replace an old unit, homeowners either remove the old unit themselves or get an electrician to do so prior to connecting the new unit. De-gassing of the unit, required by the Health and Safety at Work

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[21] NZIER (2013) Willingness to pay for six end-of-life products. Report to the Ministry for the Environment, p.42.

[22] Martinho et al (2022) Environmental behaviours and risk perception of domestic consumers: Refrigeration equipment case study. Cleaner Production Letters 3, 100024.

[23] Ibid.

(Hazardous Substances) Regulations 2017, would not generally occur in such instances, as not all electricians are specifically trained to de-gas units. There are no requirements for records to be kept on installations, charging, or degassing of these units, meaning it is almost impossible to prove that intentional venting occurs.[24]

39. It is important to note that social norms alone do not govern people's behaviour – rather, it is the balance of personal values, norms, incentives, the removal of barriers (i.e., time, cost, provision of infrastructure) and, to a lesser extent, information provision. Industry experts highlight the role that perceptions of cost play in the interplay between sector participants. Consumers do not face the social costs of emissions from substandard installation, poor maintenance, and illegal discharges, and often do not consider the whole of life costs of refrigerant in relevant equipment, instead choosing the cheapest price they can get.[25]

Difficulty monitoring and enforcing existing requirements, and current information and infrastructure provision is not sufficient to influence behaviour

40. The Ozone Layer Protection Act 1996 and Climate Change Response Act 2002 (CCRA) prohibit the intentional venting of refrigerant to the environment. However, the Government lacks oversight of compliance with this requirement. No monitoring or record-keeping requirements are in place currently. There has only been a single prosecution for intentional venting under the CCRA.

41. Data collected across domestic government agencies is scarce and inconsistent. The Working Group, in its examination of the existing regime, highlighted the difficulty in obtaining accurate and reliable data on refrigerant gases. As a result of data being collected by different agencies, for different purposes, and for different time periods, it is conflicting and confusing. This poor quality occurs despite some data reporting being required by law.[26] The Working Group state that improved data collection should be a feature of any mandated product stewardship scheme.

42. There are several practical controls in place for the management of refrigerants across relevant industries/parties. However, industry stakeholders have identified gaps and issues. Table 2 summarises these gaps and issues around refrigerant controls in the industrial/commercial, scrap metal, automotive, and heat pump sectors.

[24] Synthetic Refrigerant Stewardship Working Group (2019), Milestone 2: Report 1 – Critique existing system(s) including product regulations

[25] IRHACE, CCCANZ, and RLNZ (2022) Submission to the discussion document "Te hau mārohi ki anamata - Transitioning to a low emissions and climate-resilient future" F-gases

[26] Synthetic Refrigerant Stewardship Working Group (2019), Milestone 2: Report 1 – Critique existing system(s) including product regulations

Table 2 Identified gaps and issues with refrigerant controls and management

	Industrial/Commercial	Scrap Metal	Automotive	Heat pump sector
Gaps and issues.	Cool-Safe accepts refrigerants at their main hubs and collection points free of charge. The costs for getting a technician to de-gas equipment and take the gas for destruction can be prohibitive for some owners. Industry stakeholders indicate that this can be a significant disincentive to some and that they release the refrigerant rather than pay for it to go to the drop off. No hard data is available to verify those observations. Customs data on bulk imports differs from that reported by Cool-Safe. Participants often report more refrigerants than recorded as being imported. Different recording systems are identified as the main reason for the discrepancy. For pre-charged goods, differences between EECA and the EPA can sometimes be close to 100% in magnitude. Reporting bases (EECA records sales, the EPA imports) are thought by stakeholders to be the reason for the difference.[27]	The degree of de-gassing taking place before scrapping is unknown. Available evidence suggests that some transfer stations have Approved Fillers on site which enables these units to be de-gassed and the refrigerant collected before being sent for destruction. Others will consolidate units so they can be degassed by an Approved Filler who is brought in to carry out this work.	The Working Group expert we interviewed considered the majority of mechanics and automobile wreckers do seek the services of refrigeration technicians when degassing is required and in some instances the technicians reuse the gas for charging AC units within other motor vehicles. There are also operators who release refrigerant gas to the atmosphere intentionally or unintentionally when a vehicle is crushed, but data on this is not collected. .	No regulations in place. Fixed pre-charged AC units that are not installed correctly or serviced regularly are known to lose significant amounts of SGG refrigerant to the atmosphere.

[27] Ibid

43. The gaps and issues identified mean there is little incentive for parties to ensure refrigerants are accounted for, recycled, reused, reclaimed, or disposed of correctly, unless they are motivated by their own intrinsic values.

44. Likely trends in gas use in future add to the problem. The existing stock of heating, ventilation, and air conditioning equipment contains approximately 7,000 metric tonnes of HFC, HCFC, and chlorofluorocarbons (CFCs).[12] The total amount of retired refrigerant is expected to increase over the next 10 years, as the stock of heating, ventilation, and air conditioning equipment reaches end-of-life and HFCs are replaced by lower GWP refrigerant.

Externalities and equity issues

45. The existing arrangements make it easy for people to ignore social costs (externalities) around GHG emissions from refrigerants. Those costs are passed on to society, the environment, and future generations.

46. The current accredited scheme accepts refrigerants at their main hubs and collection points free of charge. However, there are significant costs in getting a technician out to de-gas equipment and transport it to the destruction facility. The cost varies significantly (the reported range is $6-8 per unit to $58 per unit)[20], based on factors such as whether refrigerant-containing units are decommissioned individually or in bulk.[21]

47. The working group reports in 2020 and recent key stakeholder interviews highlighted that cost can be a disincentive, and many release the refrigerant direct to the environment rather than incur the recovery and transportation costs. As indicated above, these social costs are known as externalities.

48. Measuring the extent of the externalities associated with refrigerants is not possible under current settings. There is limited ability to allocate responsibility for the proper care and disposal of refrigerants.

49. Further, there is no industry-wide compulsion to invest in education and training to ensure environmentally friendly disposal of refrigerants. Industry participants who do invest in appropriate training do so in a bespoke manner, driven by personal values. The industry's lack of a uniform training requirement is a source of frustration (in respect of fairness and consistency) for key players.[28] Following the Working Group reports, Cool-Safe has invested in research to further develop training in the sector, but the initiative has not yet been fully implemented.

Stakeholder views

50. In 2022, the Government released the document "Proposed measures to reduce the environmental impact of fluorinated gases" for public consultation. The consultation was open from 8 November to 18 December 2022 and sought feedback on the preferred proposals to introduce a regulatory framework to support a refrigerant stewardship scheme.

Regulatory framework

51. In general, stakeholders agreed with the problems identified in the consultation paper. Almost three-quarters of total submitters supported a proposed regulatory framework for refrigerants. Strongest support came from individuals, local government agencies and anonymous other organisations. Reasons for this support included:

- Product stewardship shifts costs to producers.

[28] Key person interviews and various Working Group reports.

- All interested parties should be responsible for environmental impacts (i.e. level-field concerns)
- Regulated product stewardship will enable reduction of leaks and losses (with some submitters suggesting that the Ozone Layer Protection Act 1996 should be the basis for licensing, rather than the WMA).

52. A minority opposed the regulatory framework, mainly comprised of businesses in the industry and industry associations, principally citing difficulties in equitable design given such a wide array of interested parties.

Obligation to take part

53. A clear majority of submitters also supported the proposal to obligate sector players to take part in an accredited scheme, principally as regulation:

- Is effective in minimising environmental harm.
- Ensures that all users/buyers are fully informed and able to meet their obligations.
- Would replace the voluntary scheme that has only been able to recover 10% of available legacy synthetic refrigerants.
- Would deter less scrupulous operators from entering the market.

54. The support was reasonably widespread among local government, individuals, and business/industry.

55. A small minority from industry opposed the proposal, based on views that nobody should be forced to join a body to make refrigerant purchases.

Take-back and targets

56. Most submitters agreed in principle with take-back and target proposals, citing ambition for future generations as well as consistency with international standards for recovery targets. Targets were also seen as assisting to ascertain how effective the scheme is. Individuals provided the strongest support, though business/industry submitters also provided strong support.

57. Cost and governance of training provision issues (i.e. the idea that an ITO should be the major party to determine training requirements) were cited by those who did not support the proposals.

Quality standards and workforce competencies

58. Similar patterns emerged in respect of proposals relating to quality standards for disposal, installation and reuse, recycling, or recovery, workforce competencies for sale and management of synthetic refrigerants. Most categories of respondents supported the proposal, but individuals were the strongest source of support, particularly in relation to quality standards. Support from businesses was mixed.

59. Reasons cited for supporting quality standards were relatively consistent across the various groups of stakeholders (across the supply chain). The major reasons were that regulation would provide:

- A level playing field.
- Standards that are likely to reduce leakage.
- A robust tracking tool.
- Encourage recycling within the scheme and promote verified reuse at the required standard.

60. Submitters who opposed to the quality standards proposals questioned whether they would provide benefits over and above the current arrangements, were unable to support the proposals until they had detailed scheme design information and suggested that recycling and reuse would not reduce environmental harm.

61. Submitters who supported the workforce competency proposals cited the following reasons:

- Regulation would minimise leakage risk.
- There would be consistency across other industries (e.g. plumbers and electricians).
- Public awareness and knowledge would be lifted.
- Responsible parties will not be able to avoid the cost of appropriate disposal.

62. Submitters opposed to quality standards and workforce competency proposals cited costs, and/or mixed views on how workforce competencies would reduce environmental harm as opposed to adding a delay in moving to lower GWP gases. The governance and objectives of scheme managers were also cited as reason why support was not forthcoming. Costs cited by opponents related to:

- The cost of storage and handling of relevant waste products at transfer stations.
- Compliance costs.
- Impacts on customers.
- Re-training of staff if previous training is not recognised by upgraded industry standards.

What objectives are sought in relation to the policy problem?

63. The objective is to achieve the aims of section 8 of the Waste Minimisation Act 2008 Product Stewardship, which is to: encourage (and, in certain circumstances, require) the people and organisations involved in the life of a product to share responsibility for:

- Ensuring there is effective reduction, reuse, recycling, or recovery of refrigerant products.
- Managing any environmental harm arising from the product when it becomes waste.

64. A regulated priority product stewardship scheme that better aligns social and private costs would contribute to the achievement of the objective.

Section 2: Deciding upon an option to address the policy problem

What scope will options be considered within?

65. This analysis considers how the proposed options will address the underlying causes identified above, notably how options:

- Increase the volume of synthetic refrigerant that is recovered annually, by mandating participation of importers, retailers and technicians in an accredited product stewardship scheme.
- Lift the skills of those in the industry to reduce the potential for environmental harm when working with synthetic refrigerants.
- Shift costs from society and the environment to those whose decisions give rise to the costs, across the entire synthetic refrigerant supply chain.
- Set quality standards, collect data, and improve monitoring and enforcement activities across the refrigerant industry.

66. Options are limited to actions that can support priority product stewardship for synthetic refrigerants under the WMA, including non-regulatory and regulatory provisions. Options would also need to contribute to achieving action 16.4 of the ERP

67. The analysis has been informed by the research undertaken by the industry co-design Working Group, learnings from international jurisdictions operating product stewardship (or extended producer responsibility) schemes, and public consultation.

Consultation on proposed regulations to support priority product stewardship scheme for refrigerants (2022)

68. In total, 38 submissions were received. Overall, submitters mostly supported the proposed regulatory framework, the components of which were highlighted in the opening section and are elaborated on below. Some submitters opposed the introduction of the regulatory framework, stating concerns such as the fact that only two per cent of New Zealand's greenhouse gas emissions were from refrigerants.

Consultation with population groups

69. The Ministry has not identified any population group disproportionately impacted by these problems. The Ministry consulted all groups as part of general consultation with the public in 2019 and 2022. There are no special factors (e.g., obligations in relation to Te Tiriti o Waitangi) involved in the policy problem.

What options were considered by Cabinet?

70. In 2023 Cabinet considered the following two options:

1. Status quo – voluntary accredited scheme

The management of synthetic refrigerants would rely on existing mechanisms such as the ETS and the SGG levy to phase out gases with high GWPs. The status quo also includes a voluntary accredited scheme that operates the collection and safe disposal of synthetic refrigerants.

2. Regulated priority product stewardship (preferred option)

This option would introduce regulations under section 22 and 23 under the Waste Minimisation Act 2008 (WMA). The regulations would place mandatory controls on the sale, reuse, and treatment of discarded synthetic refrigerants arising from faulty or end-

of-life equipment. In addition, the accredited scheme would need to provide a take-back and destruction service for synthetic refrigerants.

71. A possible third option, which Cabinet did not consider, is one that strikes a balance between the current voluntary state and a fully regulated product stewardship scheme. In effect, this option leaves it to industry to progress actions required to improve the management and disposal of refrigerants, in the knowledge that regulations were still a possibility, which would be signalled by the Minister.

Criteria that options are evaluated against

72. Criteria for options to ensure they best meet the objective stated above are that an option is:

- Effective – reduces the actual or potential environmental harm.
- Efficient – results in increased present and future net societal well-being (i.e. makes society better off relative to the status quo, or other options).
- Equitable – produces a cost allocation among parties that better aligns private and social costs (i.e. deals with externalities).
- Implementable – is sufficiently practical that implementation is relatively straightforward.

73. There are likely to be trade-offs. Shifting cost burdens for equitable reasons may result in less effectiveness in terms of environmental outcomes, due to behaviour changes associated with respective responsiveness to cost changes.

74. Consumers most likely to alter behaviour in a negative way due to price changes might respond by using improper or illegal means of disposing equipment with these gases following intervention than would have been the case in the counterfactual. Monitoring and enforcement costs would rise to the extent that detection of such behaviour is a priority.

75. Hard evidence to substantiate the extent to which such potential trade-offs might arise does not exist.

Assessing the option against the status quo

76. Table 3 contains compares the preferred option to the status quo.

Table 3 Comparison to the status quo

Criteria	Status Quo	Regulated Priority Product Stewardship Scheme
Effective – reduces actual and potential environmental harm.	0	++ Through better training, improved data collection and better understanding of environmental impacts of refrigerants, rates of gas recovery are expected to increase, and release of harmful gases into the atmosphere would reduce.
Efficient –raises societal well-being.	0	+/- There are costs to all parts of the refrigerant industry, some of which are substantial. Society might be made better off, but it

Criteria	Status Quo	Regulated Priority Product Stewardship Scheme
		could also be made worse off. The uncertainty associated with the range of benefit values does not allow a definitive finding to be made, but the balance of the negative and positive values suggests a net benefit to society. The training component impacts industry significantly, but timing has been adjusted to allow for a phased transition.
Equitable – apportions costs in a way that better aligns private and social costs.	0	+ Shifts costs from society in general and the environment to those whose decisions give rise to the costs, across the entire refrigerant supply chain.
Implementable – able to be implemented	0	+ There are some risks to implementation, but their likelihood and their impact is not known at this stage. Mitigation options exist, and industry stakeholders are aware that further development in some areas is required as the scheme beds in.

Key: - worse than status quo; + - better than status quo; -- much worse than status quo; ++ much better than status quo

What was the Government's preferred option, and what impacts will it have?

77. Cabinet agreed to the Regulated Priority Product Stewardship option (Option 2 above). This option involves:

1. Prohibiting sale of refrigerant, except in accordance with an accredited scheme. This regulation requires importers and producers to participate in an accredited scheme and comply with its requirements.
2. Setting a quality standard for end-of-life refrigerant management, which would restrict the activity of recovering refrigerant to a qualified technician.
3. Restricting the purchase of refrigerant to a qualified technician. A new Product Stewardship Organisation (PSO), a non-profit organisation accredited to operate the scheme, would set the qualification requirements, and certify that technicians meet them.
4. Restricting the disposal of refrigerant to high temperature incineration or another method that ensures full destruction. The method has a minimum destruction and

removal efficiency of 95 per cent for dilute sources and 99.99 per cent for concentrated sources.

5. Require the accredited scheme to provide a take-back and destruction service for synthetic refrigerants.

78. Regulations 1, 4 and 5 will come into effect 28 days after the regulations are gazetted and regulations 2 and 3, will have a three-year commencement period.

Impacts of the chosen option

79. This option creates responsibilities that potentially affect all parties involved across the refrigerant supply chain. Not all of the responsibilities set out in Table 4 are new, but any existing responsibilities will grow (with associated costs which are discussed further below).

Table 4 Responsibilities created by a regulated scheme

Party	Responsibility
Regulator (Ministry for the Environment).	Responsible for developing regulations, compliance, monitoring and enforcement activities, and performance reporting.
Accredited Scheme, Product Stewardship Organisation.	Responsible for scheme set-up and implementation, ongoing governance and operations (e.g. offshore disposal and destruction services, corporate expenses such as overheads, training elements, communications, ongoing scheme management, and ongoing reporting requirements).
Industry (includes automotive technicians, electricians, importers, HVAC technicians, scrap metal dealers, producers, retailers).	Responsible for participation, ensuring competence through training and monitoring, raising awareness of others in the supply chain, meeting compliance requirements around quality, collecting and reporting relevant data.
Consumers.	Responsible for purchase, operational (e.g. maintenance), and disposal-related choices that better reflect the potential for environmental harm of refrigerants (e.g. insisting on making sure technicians are trained/certified and provide assurances that refrigerants will be disposed of in an environmentally friendly manner). This responsibility is indirect because consumers will not be regulated.
Society in general.	Individuals in society will be indirectly responsible for increasing awareness and understanding of the role that refrigerants play in climate change and the need for vigilance. This responsibility is indirect because these individuals will not be regulated.

80. Relative to the status quo, additional costs will be incurred, though not universally. For instance, parties that already provide training for their staff could only face modest additional costs and may derive some benefit from the potential recognition of training

through credentialisation or any efficiencies gained from wider provision. For other parties, costs rise from the obligation to participate in the scheme.

Regulator costs

81. The Ministry for the Environment will incur financial and resource costs in relation to monitoring scheme performance, general activities associated with the scheme (i.e. organisational and administrative costs associated with day-to-day oversight of the scheme), and potentially validating and storing collected data (though this is the responsibility of the PSO). Most of these costs are on-going, though activities around data validation and meetings with other stakeholders to discuss concerns or seek feedback on scheme performance are more 'one-off' in nature.

82. The estimated costs are for three full-time equivalent staff (two for compliance, monitoring and enforcement, and one for scheme monitoring). In addition, the Ministry will redeploy existing staff to assist with regulation development. The redeployed staff will incur opportunity costs for their time i.e. time taken away from other policy development.

Scheme (PSO) costs

83. The new PSO entity will incur additional costs. These costs will be associated with:

- IT platforms for the increased data collection and reporting to the regulator and members. Some hardware costs would be one-off in nature, while IT equipment servicing, and maintenance would be on-going.
- Labour for:
    - Governance –recruitment, as well as ongoing salary, professional development, and board secretariat services.
    - Data validation provided by members to the PSO, to ensure consistency with data held by other government agencies.
    - Competency assessment framework and validation process development.
    - Workload increases due to expected greater volumes of recovered refrigerant (including a take-back service and offshore disposal services), enhanced management and reporting of NZUs, scheme governance and management, delivery of new services to participants (e.g. mass data flows), technical support, incentive programmes, quality standard monitoring and enforcement.
- Corporate (including overhead) costs of premises leasing, training, information awareness and education programmes, website maintenance, industry body activities (e.g. networking events, industry summits, awards nights).
- Destruction facility costs including plant operation and salaries.

84. s 9(2)(b)(ii) [redacted]

Industry costs

85. The nature and magnitude of costs incurred by respective industry players is not uniform.

Training dominates

86. Training requirements to achieve competence standards would be the largest cost to industry (present value cost of $48 million for technicians to 2050). The size of the cost reflects the reported issues around the mixed levels of competence, and knowledge of

refrigerants and their potential for environmental harm.[29] Despite costs, the opportunity to standardise and recognise competency across the industry is valued by stakeholders.[30]

87. The 'training gap' for the sector and for sub-parts of the industry cannot be calculated with any precision. We rely on existing high-level data that is unable to be validated by a 'building block' approach summing sub-sector-specific data to match the overall industry estimate. In part, this is due to data not being collected, but the situation also reflects the lack of visibility of refrigerants in many sub-sectors (e.g. automotive, electrical, some heat pump installers).

Estimated numbers requiring training

88. There are an estimated 16,775 technicians. This total comprises an estimated 7,000 refrigeration technicians, 3,200 licensed electricians and 1,775 workers in the automotive sub-sector who work on HVAC activities. In addition, an estimated 4,800 unqualified people with no designated occupation work on heat pumps.

89. There is currently no certainty on the recognition of existing qualifications (either international or domestic), or how work experience is applied. Available evidence supports the Working Group's position, and other stakeholders interviewed as part of this work state that some form of recognition is required. Therefore, not all of the estimated 16,775 technicians would require the same degree of training.

90. For this analysis, we use evidence from industry to identify a plausible distribution of worker qualifications, and apply the following 'recognition rules':

- Strong recognition (36%): those who have received training and therefore only require only modest additional training, if any.
- Weak recognition (51%): those who are competent but have not received any formal (or current) training require a medium level of additional training.
- No recognition (13%): those who are untrained or not competent and require substantial training.[31]

91. Differing levels of training cost are applied to the respective groups to monetise the estimated training cost burden associated with the regulated stewardship scheme.

- Strong recognition - $375 per person, the cost for a technician to complete a refresher course, supplied by industry.
- Weak recognition - $1,270 per person, an average of the strong recognition and weak recognition figures.
- No recognition - $2,165 per person, using the upper bound of MBIE's costs for refrigerant technicians to complete training (adjusted to 2024 dollars). While MBIE's costs are for a licensing scheme, the costs to bring an untrained technician up to an industry standard will likely be similar, noting that the training required to deal with

[29] Synthetic Refrigerant Stewardship Working Group (2019), Milestone 2: Report 1 – Critique existing system(s) including product regulations.

[30] Synthetic Refrigerant Stewardship Working Group (2019), Milestone 3: Report 3 – Scope for industry credentials.

[31] Some of the affected workers could either exit the industry or continue to work 'under market' without the necessary training, rather than face the costs. We are unable to estimate this proportion, so include the training costs in full.

natural and synthetic refrigerants will be different. In the absence of further training specifications, this upper bound is deemed an appropriate proxy.

Costs of participation and compliance

92. There will also be costs to industry associated with participation in, and compliance with the scheme, as well as some data collection costs. We are not able to monetise these costs but consider that they would be low.

93. As highlighted above, some businesses (including those who participate in the voluntary stewardship scheme and some who do not) already conduct training, collect data, and monitor staff and equipment performance.

94. Most stakeholders do not believe that the transition to a regulated scheme will result in substantial costs. Additional expenses from the training programme and delivery settings are expected to be limited because of the presence of formal and informal training programmes.

95. However, there are some parties who do not agree with mandated participation, or who see some costs ("not substantial, but still adding to the costs of doing business") but struggle to identify benefits that would accrue to their business. The latter accept that there may be sector-wide benefits over time and indirect/softer benefits in business operation (i.e. less need to send out staff to deal with faulty or poor technician workmanship on their equipment).

Industry concerns with potential for duplication of costs

96. Two concerns raised by industry are the possibility of duplicated costs and business disruption costs.

97. As MBIE were developing a licensing regime for refrigeration technicians[32], many in the industry raised the prospect of essentially doubling up on costs to business from two distinct initiatives that largely affect the same people.[33] Industry is looking to avoid that possibility as in their experience, agencies are not always receptive to collaborating to ensure that costs are not duplicated. While this does not necessarily alter the cost burden strictly relating to the regulated scheme, the industry may incur additional compliance costs and it may limit the marginal benefit.

98. Industry stakeholders proposed an 'umbrella' framework in their 2020 co-design report to avoid this potential duplication. This concept underpins the training framework and register of qualifications that the Cool-Safe scheme is currently developing.

99. Relevant companies also highlighted that it is not the financial or out-of-pocket costs of training that has the most impact on them, but the possibility of disruption to business operations from staff having to attend day-long training sessions. Often staff like to go together to compare their learning and experience, and this can mean that smaller firms in particular are unable to effectively 'back-fill.' This impact is contingent on the structure and delivery of the training and cannot be avoided but according to

[32] As of October 2024 this work has been paused pending the outcome of consultation on the work health and safety regulatory system.

[33] Refrigerant Sector Training - Independent Review (2023), stakeholder interviews.

stakeholders can be better managed with appropriate training plans. No quantified estimates of cost were available.[34]

100. These concerns would be mitigated by appropriate mutual recognition, for example, if the MBIE qualification was to be accepted as proof of competency.

Consumer costs

101. At a general level, the potential for refrigerant-related environmental damage through the consumer sector is less than the commercial and industrial sectors. While greater in number, domestic equipment, such as heat pumps, and car air-conditioning systems contain less refrigerant than commercial and industrial equipment, therefore reducing possible volumes release to the environment.

102. Any additional costs faced by consumers (households) relate to the degree of pass-through by industry of their cost increases. Available evidence around intentions is mixed. Some industry players, mainly refrigeration and air-conditioning business, suggest that because they provide bespoke training already the additional burden would be minimal, the costs of participation are modest, and the cost pass-through to consumers would be minimal.

103. On the other hand, some businesses in other parts of the industry indicate that any rise in costs, from training, participation and compliance monitoring would inevitably be passed on to consumers. Those businesses were not able to quantify the cost pass-through prior to the regulated scheme being implemented.

104. Some individuals who currently have the ability to purchase refrigerant gases in order to top-up air-conditioning units in their cars themselves would no longer be able to do so. They would face the costs of having the unit replaced or paying for a qualified technician. There is no available data on the extent of this practice, though industry players have expressed a view that such behaviours could be a major cause of refrigerant release under current settings.

Societal costs

105. There are no obvious costs to society arising from the regulated scheme.

Expected benefits

106. The expected benefits of the regulated scheme option are shown in Table 5.

Table 5 Benefit summary

Benefit	Comments
Environmental benefit.	Significant. Refrigerant recovered for destruction could rise from 10 per cent in 2024 to 20 per cent by 2034 in a low policy impact scenario or 35 per cent by 2034 in a high policy impact scenario. Without intervention, refrigerant recovery is expected to be 17 per cent in 2034.[35] The magnitude of these recovery figures is disputed by some industry members.
Better knowledge through data collection improvements.	Direct benefit from industry understanding and acceptance of the state of refrigerant use, release, and recovery, to allow targeted actions.

[34] Stakeholder interviews.

[35] Verum Group (2023), MfE Projections Final, unpublished

Benefit	Comments
Alignment with overseas jurisdictions.	Better harmonisation of systems and New Zealand's reputation would be enhanced.
Greater skill levels of technicians.	Direct reduction in the risk of environmental harm from emissions during disposal and indirect reduction in risk during installation and maintenance. Potential for fewer callouts as less gas is lost. Cost savings will likely fall on consumers.
Clarity around responsibilities.	All of industry would be held accountable and take responsibility for recovering gases from end-of-life equipment and arranging for its environmentally safe treatment. Social costs would be better aligned with private costs.

What do stakeholders think?

107. In the 2022 consultation, there was strong support (87 per cent of those who answered the question) for a regulatory framework based on mandated participation in an accredited scheme, sales and purchase restrictions, take-back and destruction service provision, and quality standards. Reasons provided for such support included the shifting costs to producers, making every party responsible for their actions/costs, and regulations will enable reduction of leaks and losses.

108. Four submitters (around ten per cent) did not support the proposal. Their rationale was that only two per cent of New Zealand's emissions are attributed to F-gases, the proposed regulations could have adverse impacts on the environment and economy, and it is difficult to develop an equitable system for such a large sector. One submitter supported regulations, but recommended they be developed under the Climate Change Response Act rather than the WMA.

109. Table 6 summarises stakeholder feedback.

Table 6 Stakeholder feedback summary

Proposed regulation	Submitter Feedback
Participation requirement Those selling priority products must do so in accordance with the accredited scheme. Producers, importers, and retailers must participate in an accredited scheme and comply with its requirements.	89 per cent of submitters who answered the question supported the proposal. The reasons for support were largely to ensure the scheme is effective and minimise harm from refrigerants. Submitters who did not support the regulated framework had concerns there was minimal engagement from industry during the co-design process.
Qualification requirements Introducing qualification requirements for people who purchase refrigerant or decommission or dismantle refrigerant-containing equipment or recover refrigerant.	86 per cent of submitters who answered the question supported the proposals to restrict refrigerant purchase to a qualified person and 93 per cent for decommissioning or dismantling equipment for recovery refrigerant. 89 per cent of people who answered the question supported the proposed code of compliance requirements under the Ozone Layer Protection Act. The key reason for submitter support was that restricting these activities to qualified technicians would reduce leakage.

Proposed regulation	Submitter Feedback
	Submitters felt more time was needed to prepare for the proposal to take effect. Submitters also suggested that qualifications should be handled by an entity separate to the accredited scheme.
Disposal requirements Require business decommissioning, dismantling, or degassing of any equipment containing refrigerants to ensure gases are disposed of through full destruction (such as a plasma arc plant) or are recycled into plant with documented leak-testing and repair protocols.	Consultation feedback largely supported the proposal to ensure refrigerants are disposed via a method that ensures full denaturing of the substances (89 per cent of submitters who answered the question) or are recycled into equipment with documented leak-testing protocols (65 per cent of submitters who answered the question). The key reason for support was the standards would prevent leakage, but some submitters were concerned refrigerants should not be reused due to the risk of environmental harm from leakage.
Take-back and targets Require the accredited scheme to provide a take-back service to the public that is free at point of collection. The Government could set targets via regulation, for instance to require the scheme to collect a certain volume of refrigerant per annum.	Submitters were strongly supportive of the concept of introducing take-back and target requirements, with 100 per cent agreement from those who answered the question. While in agreement, a few submitters did note concerns regarding specific targets and five submitters recommended additional targets.
Scheme funding The consultation sought public input on whether the regulated refrigerant scheme should be funded in the first years through NZUs earned under the ETS by the Trust for the Destruction of Synthetic Refrigerants, while longer-term funding options are developed and consulted.[36]	Most submitters supported this funding proposal (85 per cent of total submitters who answered the question). Some submitters argued that funding the scheme through ETS credits could add administrative costs. Other submitters expressed the view that there needed to be greater consistency on how product stewardship schemes were funded, given other schemes, such as e-waste, will be funded through levies charged to importers/manufacturers.

110. In preparing this analysis, key industry stakeholders were contacted in order to strengthen the evidence base. The results were somewhat mixed. We were able to substantiate some figures in respect of training requirements and costs, and identify some potential implementation risks, but the lack of hard data meant we were not able to fully validate anecdotal evidence (e.g. the extent of leakage, and poor practice).

[36] An explanation of this funding option is at paragraph 15.

What are the marginal costs and benefits of the option?

111. The results of the cost-benefit analysis (CBA) are outlined below. The CBA was prepared in line with guidance provided by the Treasury.[37] The CBA takes a societal perspective (rather than focusing on sectors or government) and reports economic costs and benefits. Economic costs (and benefits) relate to resource use as opposed to financial costs and benefits that focus on flows of money between parties. Factors such as transfers between parties, taxes, inflation, and depreciation do not feature in economic CBA.

112. The net impact of the regulated priority product stewardship option ranges from -$194 million in a low policy impact scenario to $247 million in a high policy impact scenario in present value terms. Ranges are preferred to point estimates wherever data allows. The range is driven by the emissions reduction benefit estimate, which are based on Verum's emissions reduction projections in low and high policy impact scenarios. Those estimates are acknowledged by Verum to be subject to considerable uncertainty.

113. Impacts are presented in present value terms to reflect the social impact to New Zealand over time. A discount rate of five per cent is used as per Treasury guidance for regulatory proposals.

114. Table 7 summarises the results of the monetised and non-monetised costs and benefits. Key assumptions that underpin the monetised cost estimates include:

- Status quo costs are estimated by estimating variable and fixed costs reported in existing information to hand. Annual fixed costs are assumed constant over the life of the regulation. Annual variable costs are projected forward using the growth rate in Verum's total refrigerant recovered under the status quo.
- Costs associated with the construction of an onshore destruction facility are treated as sunk (i.e. they are not included in the costs of the preferred option) as construction, which is nearly completed, would have occurred regardless of any regulated option. Variable destruction costs scale with refrigerant recovered.
- PSO costs are reported only to the extent that they are likely to be greater than the estimated status quo costs. PSO costs were provided directly by the Ministry. Given the difficulty establishing status quo costs. A range is used. The lower bound takes into account estimated PSO costs for activities that would have been undertaken regardless of the regulations, and hence fall within the status quo. The upper bound assumes that all of the incremental costs identified relate to the preferred option. That is, costs were incurred in anticipation of becoming the PSO under the preferred option.
- Regulation development costs are based on the regulated product stewardship scheme for tyres.
- Refrigerant technician costs are estimated for 16,775 and 8,775 technicians respectively. The range reflects alternative views of industry experts, specifically around the number of electricians who might work on heat pumps. The two

[37] Treasury (2015), Guide to Social Cost Benefit Analysis

estimates form upper and lower bounds for technician costs. Technician costs are then estimated by taking this range and splitting technicians into those with:

i. Strong mutual recognition, equivalent to those stated by industry to have received training.

ii. Weak mutual recognition, equivalent to those stated by industry to be competent but have not received any formal or current training.

iii. No mutual recognition, equivalent to the remaining technicians who are assumed to be untrained and not competent.

Each categories' technicians were then costed using figures provided by the industry and MBIE's RIS for a licensing system for refrigeration, heating, and air conditioning technicians. The assumption is that new technicians' training would not have been provided without the regulated product stewardship scheme.

- Training provider costs draw from from MBIE's published regulatory impact assessment for work on a licensing system for refrigeration, heating, and air conditioning technicians.

115. The monetised benefits draw on Verum's projections of HFCs stocks. The incremental refrigerants recovered for low and high impact scenarios are estimated relative to status quo recovery. These two figures are then costed using the recovered refrigerants' respective GWPs reported in the ERP and Treasury's shadow price of carbon. While acknowledging that international comparisons of recovery rates is difficult, due to inconsistent definitions, we note that the projected recovery rates estimated by Verum appear low relative to figures overseas.

116. Lack of data meant some potential benefits were not able to be quantified, and hence monetised. Examples of such benefits include productivity gains due to enhanced training requirements for technicians (with associated rises in income), and pecuniary externalities associated with less cost to replace gas that would otherwise have leaked and owners not having to replace equipment as soon as they do now. There are also likely to be gains to consumers, in terms of avoided search and discovery costs associated with finding skilled and trusted technicians (i.e. over time there will be more standardisation of training and capability of technicians due to the regulations).

Table 7: Monetised and non-monetised costs and benefits for Option 3, (present value from 2050)[38]

Affected groups	Comment	Impact (PV from 2050)	Evidence Certainty
Additional costs of the preferred option compared to taking no action			
Regulators			
Ministry for the Environment	**Regulation development** Cost to develop new regulations under the WMA, provided through existing FTE. Cost includes public discussion document and advisory group for regulation development.	$0.3 million	Medium

[38] Training cost estimates were based on previous published regulatory impact statements from MBIE on the HRWL system for refrigerants. Costs may change in due course.

Affected groups	Comment	Impact (PV from 2050)	Evidence Certainty
	Compliance, monitoring, and enforcement Two full-time equivalent (FTE) persons needed for compliance, monitoring and enforcement of regulations. CME staff cost of $110,000 p.a. and overheads of $110,000 p.a.	$5.1 million	Medium
	Scheme performance monitoring Up to one FTE person to monitor scheme performance against the accreditation requirements. Staff cost of $110,000 p.a. and overheads of $110,000 p.a.	$3.4 million	Medium
Regulated groups			
Accredited Scheme, PSO	**Scheme implementation**	$1.3 million (accrued largely over three years)	Medium
	Governance expenses including Board remuneration, Advisory Group expenses, and professional services	$11.4 million	Medium
	Corporate expenses including salaries, training, leasing office space, branding and collateral, website maintenance, overheads	$10.6 million to $11.7 million	Medium
	Scheme management costs including salaries, IT systems, compliance, technical support (such as promotion and education), take-back service, incentive programmes	$120.1 - $151.4 million	Medium
	Destruction expenses associated with the additional refrigerant recovered under regulated scheme. The range is based on the additional refrigerant recovered under the low and high policy impact scenarios.	$1.2 million to $4.9 million	Low
Industry	**Cost to refrigerant technicians** to ensure qualifications standards. 8,775 to 16,775 technicians with some mutual recognition based on existing qualifications. Costs are based on MBIE's licensing system for refrigeration, heating, and air conditioning technicians.	$25.1 million - $45.3 million	Low
	Cost to refrigerant companies to comply with scheme. This marginal cost is expected to be low given the anecdotal evidence of data collection and extent of existing training regimes in industry.	Low	Low

Affected groups	Comment	Impact (PV from 2050)	Evidence Certainty
Consumers	Costs incurred by industry may be transferred to consumers	Low	Medium
Other			
Training providers	**Providing additional training** to technicians that do not meet the required standard of training.	$11.3 million - $19.6 million	Low
Total monetised costs		$189.8 million - $254.4 million	Medium
Non-monetised costs		Low	Low
Additional benefits of the preferred option compared to taking no action			
Regulated groups			
Industry	**Positive PR** – 'doing the right thing'.	Low	Low
	Productivity increases– to the extent training leads to productivity increases due to enhanced technician skill levels and a smoother functioning industry as a result of clearer lines of responsibility and accountability	Low	Low
Society	**Enhanced knowledge**- greater understanding of refrigerants and their consequences due to better data collection and reporting; alignment with overseas jurisdictions reducing confusion	Low	Low
Consumers	**Cost savings** from better access to drop off locations for end-of life equipment, and potential for reduced expenditure replacing gas that has leaked	Low	Low
Environment	**Emissions reduction increases**. Ranges depend on low and high policy impacts provided in Verum's projections.	$60.1 million - $437.2 million	Medium
Total monetised benefits		$60.1 million - $437.2 million	Medium
Non-monetised benefits		Low	Low
Net impact		-$194 million to $247 million	Medium

117. The net impact shown in the table highlights that, relative to the status quo, society could be made better off by $247 million (in present value terms) but could also be made worse off by $194 million (in present value terms). The available information on high and low emissions reductions benefits does not allow us to determine which of those possibilities is more likely. Monetised costs and benefits are subject to

uncertainty on both sides, meaning caution should be exercised in weighting the CBA results more highly than those of the multi-criteria analysis in Table 3.

Section 3: Delivering an option

How will the new arrangements be implemented?

119. This section outlines how the preferred option can be given effect. It outlines current preparation, impacts on the sector, implementation risks, and plans to manage these risks.

120. Initially, the Ministry for the Environment will have responsibility for development, finalisation and bringing into force the regulations, under sections 22 and 23 of the Waste Minimisation Act 2008 and under section 11 and 13 of OLPA. The Ministry would also be responsible for enforcement, conducting audits and investigating potential breaches of regulations.

121. The Ministry would require importers and the PSO to keep records of compliance and investigate where non-compliance is detected. The Ministry will develop guidance on requirements of the regulations and how to comply with them.

122. The PSO will be responsible for most of the practical implementation. It will have a role in monitoring compliance of scheme participants. To monitor compliance, the PSO will set record-keeping requirements. Non-compliance can be escalated to the Ministry.

Preparations are underway for an accredited scheme

123. The Trust will operate the accredited scheme under the brand name Cool-Safe. It is actively preparing for the transition from its voluntary scheme to the proposed regulated priority product scheme.

124. Cool-Safe has been progressively implementing new operational procedures and policies as part of its application for accreditation as the PSO. The Trust:

- Rebranded from ‘Recovery’ to ‘Cool-Safe’ in October 2022. The Cool-Safe scheme allows for end users and contractors to hand over responsibility for safe disposal of refrigerants through a network of collection systems.
- Established a national collection network for recovered refrigerants, utilising suitably skilled technicians to decant refrigerants (contracted through a supply agreement).
- Employed (October 2022) a dedicated Collection Services Business Development Manager with the intention to expand the collection network.
- Employed (October 2022) a dedicated Communications Manager to increase awareness and engagement across industry of the collection network for recovered refrigerants, and to extend this reach to include businesses, organisations and consumers who purchase and use equipment.
- Launched the recovered mixed Refrigerant Bounty Buy-Back Programme (October 2022) that publicises a financial incentive for industry. The programme rewards those who are depositing end-of-life mixed refrigerants at its collection sites, with the aim of increasing the recovered volume of refrigerants.

125. The proposed priority product scheme design was completed in May 2020. In late 2022, Government consulted on proposed regulations to enable regulated product stewardship for Refrigerants (CAB-22-MIN-0564). In April 2023, the Trust applied for priority product stewardship accreditation of Cool-Safe—its rebranded refrigerant recovery scheme. A decision is expected in late 2024 following independent review.

126. Cool-Safe’s accreditation will ensure the set-up for the sale of refrigeration in accordance with an accredited scheme and the provision of a take-back and destruction service (regulations 1 and 4). Further work will be required te o establish

the quality standard requirements for qualified technicians by 2027 (regulations 2 and 3).

Onshore disposal of refrigerants will be possible from 2024

127. The Trust is building a plasma arc plant for the destruction of refrigerants (and other chemicals). The plant has been commissioned with an initial capacity to destroy 100 tonnes of refrigerant per annum and is expected to be operational in 2024.

128. The plasma arc will enable onshore destruction of refrigerants. Previously, refrigerants were exported to Australia. The facility will enable further capacity to dispose of refrigerants with high temperature incineration (regulation 5).

129. As an onshore destruction facility, the plasma arc will have the following benefits:

- It will eliminate the need and risk from shipping refrigerants offshore for destruction.
- The facility can be used for the destruction of other hazardous chemical waste.
- It will support New Zealand as a party to the Basel Convention by reducing the need to ship hazardous waste offshore.

Regulations would be developed under sections 22 and 23 of the WMA and implemented in two tranches

130. The proposed regulations would be developed under sections 22 and 23 of the WMA, subject to Cabinet approval. The Ministry would work with the Parliamentary Counsel Office to draft the regulation and would report back to Cabinet in 2024.

131. The proposed regulations would be introduced in two tranches. Tranche one regulations would establish the measure to enable mandatory participation in the scheme, keeping records of synthetic refrigerant related activities, and recovery of gas from end-of-life equipment. Tranche two would establish the requirements to avoid intentional release of gases as well as training and certification provisions.

132. Tranche one is expected to be in force from mid-late 2024. Tranche two will come into force three years later. The three-year gap will enable industry and refrigerant technicians time to upskill, become certified, and manage any pressures on training providers that may occur.

Table 8: Impact on sector from the proposed refrigerant stewardship regulations

Timeframe	Proposed Regulations	Impact on sector
Tranche one (mid-late 2024)	The "in effect" date is subject to Cabinet approval. It is expected to be mid-late 2024: - Prohibit the sale of refrigerants except in accordance with the accredited scheme. - Require disposal of refrigerant to methods that ensure full destruction. - Require the accredited scheme to provide a take-back (collection) and destruction service for refrigerants.	Persons selling refrigerant, i.e. importers would need to do so in accordance with the accredited scheme. Persons capturing refrigerants from equipment containing refrigerants would need to ensure the refrigerants are either destroyed via high-temperature incineration or reused. The accredited scheme would need to provide collection and destruction services for refrigerants. Consumers and stakeholders such as facility managers will be educated through the accredited scheme's communication platform and via direct

Timeframe	Proposed Regulations	Impact on sector
		engagement.
Tranche two (3 years after Tranche one)	Subject to Cabinet approval, the earliest in effect date is May 2027: - Restrict the purchase of refrigerant to a qualified Refrigerant Technician - Set a quality standard to ensure refrigerant is only recovered by a qualified Refrigerant Technician.	Persons buying refrigerant or capturing and disposing of refrigerant, would need to demonstrate they hold appropriate certifications and/or qualifications for safe refrigerant management.

Implementation risks

133. The following subsection details implementation risks as they relate to a mandatory product stewardship scheme. These risks, their evidence, and consequent mitigation measures are outlined in Table 9 below.

Table 9: Implementation risks

Risk identified	Evidence or possible cause of risk	Mitigation of risk
The PSO is ineffective	The PSO may use it resources inefficiently. Inefficient resource use can lead to poor performance, greater costs than needed, friction with stakeholders, and reduced effectiveness.	The Ministry can revoke scheme accreditation if scheme is not meeting stated outcomes The PSO would be required to regularly report on the scheme's performance, including on meeting the scheme's objectives.
	The PSO has insufficient skills to run the scheme.	Draw on experience from existing voluntary scheme as well as the Ministry's experience implementing similar regimes e.g. the tyres product stewardship scheme.
	The Ministry may provide the PSO with poor targets. Poor targets can lead to over or understated performance.	Robust development of PSO targets, drawing from best practice. Targets and progress towards these targets published in annual reports.
Unwillingness of industry to participate in the scheme	Industry may be dissatisfied with the regulation. Duplication of costs due to MBIE licensing regime being developed for refrigeration technicians in respect of hazardous gases.	Co-design development process. Appropriate compliance, monitoring, and enforcement (CME) measures. Information and awareness campaigns to build trust. Potential to recognise MBIE requirements as proof of competence for the regulated stewardship scheme proposed here (i.e. no need to pay twice or receive joint certification).
Litigation from parties unsatisfied with the accreditation process and appointment of PSO	Submissions to the Ministry highlighted that some parties may be unsatisfied if Cool-Safe is appointed as the PSO. Any residual resentment can lead to reduced participation and engagement in the scheme.	The Ministry would ensure that the appointment and evaluation process is robust, transparent, objective, and rigorous. Any applications that are received in addition to Cool-Safe's will also be considered.

Risk identified	Evidence or possible cause of risk	Mitigation of risk
Voluntary non-compliance	Compliance and enforcement measures are insufficient to ensure the industry's compliance.	Broader CME strategy that tailors the tools for circumstances. This strategy will include appropriate enforcement measures, detection measures, and assistance (e.g. information and guidance) to ensure compliance. Two CME FTEs focusing on this matter. This is in line with similar legislation in New Zealand, for example, the Ministry's regulation to support product stewardship schemes for tyres. The Ministry will ensure the public accountability of the PSO. Public accountability involves clear information on the scheme's workings, transparent chain of custody for collected refrigerants, and published annual reports that include target reporting.
Involuntary non-compliance	Importers, manufacturers, and producers may struggle to comply with the scheme if a start date is too near.	The time taken to establish the accredited scheme, and for parties to become compliant with any requirements will need to be appropriately considered.
	The 16,775 technicians may struggle to become qualified by the start date.	The two-tranche implementation plan provides a three-year lead-in time to enable technicians to become compliant. Appropriate mutual recognition of current qualifications and training. Guidance for appropriate mutual recognition is stated in the Synthetic Refrigerant Stewardship Working Group' Milestone 4 Report 2 document.
Insufficient upfront investment in collection sites	Collection sites with sufficient capacity are required to ensure refrigerant can be recovered. This issue will be magnified for rural areas and other isolated locations where access to refrigerant facilities can be limited.	The Trust has recently implemented measures to improve access to refrigeration facilities, including establishing a national collection network, employing a Collection Services Business Development Manager to expand the collection network, and employing a Communications Manager to increase awareness and engagement with the collection network.

Risk identified	Evidence or possible cause of risk	Mitigation of risk
Inadvertent anti-competitive effects	The regulation will prohibit the sale of refrigerants except in accordance with the accredited scheme. Anti-competitive effects will arise to the extent that any importer or manufacturer is unfairly advantaged.	The PSO must disclose its proposed requirements for selling a product in accordance with the scheme. All governance activities will adhere to the Commerce Commission guidelines on collaborative activities between competitors, including but not limited to considering the option of applying for collaborative activity clearance from the Commission for the scheme.
Lack of strong and verifiable evidence of impact	There is limited data on the impact of introducing regulations to support the refrigerant scheme.	The scheme will be required to record, monitor, and report on its performance to the Ministry regularly. Australia implemented mandatory participation in a product stewardship scheme and mandatory training requirements despite the lack of concrete evidence for a problem.
Costs are greater than budgeted	The scheme's benefits rely on incurring a level of costs. However, any undue cost burden poses a risk to the scheme's efficacy.	The scheme's costs and benefits will be monitored, to the extent possible, through annual reporting requirements. The threat to revoke scheme accreditation will encourage effective cost management.
The CME system will not be ready for implementation	A functioning CME system is required to ensure compliance with the proposed regulation.	The Ministry can leverage its existing expertise in CME implementation, for example, drawing from the learnings from the current implementation of the product stewardship scheme for tyres. The Ministry plans to operate the CME function as part of its business-as-usual activity.

How will the new arrangements be monitored, evaluated, and reviewed?

134. The following section outlines how the regulation will be monitored, evaluated, and reviewed. It states the roles, responsibilities, and requirements of key parties to the regulation, as well as arrangements to review the scheme.

Roles, responsibilities, and requirements

135. The Ministry would be responsible for enforcing the proposed regulations. It would do so under the WMA.[39] The Ministry would appoint two CME personnel to enforce compliance with the scheme. After the first three years of operation, resourcing requirements and their application would be reassessed.

136. Where alleged breaches of,[40] or instances of non-compliance with, the proposed regulations are identified, enforcement tools would be used to bring positive behavioural change and deter future offences. Enforcement approaches would be proportionate to the seriousness of the noncompliance, following an investigative process.[41]

137. The accredited scheme would monitor scheme participants' compliance with any of its requirements. The scheme may escalate issues of non-compliance to the Ministry.

138. The accredited scheme would be required to submit an annual report to the Minister outlining its performance. The report would contain information on financial performance (including scheme cost effectiveness), environmental performance (including performance against objectives, targets, and best practice collection rates in other jurisdictions), and agreements with scheme service providers. The Ministry will use this information to review the effectiveness of the accredited scheme, and to inform future reviews.

139. Scheme participants—importers, wholesalers and retailers, refrigerant technicians, owners of HVAC14 equipment, and consumers—would have roles, responsibilities, and legislative obligations. These are listed in Table 10 along with the proposed monitoring tools.

Review of the scheme

140. The scheme will have a maximum review period of four years. The review would cover the overall efficacy of the scheme and associated regulations.

141. Outside this scheduled review, a review of the regulations may be triggered by lower-than-expected refrigerant recovery (collection) rates or if significant unintended consequences are reported which query the appropriateness of the scheme.

142. A review may also be triggered by legislative change at a national or international level. For instance, the Resource Management Act 1991, WMA and the Litter Act 1979 are currently being reviewed. Change has been indicated for the WMA.

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[39] 1 Section 14 of the WMA requires an accredited scheme to monitor and report on its performance, and section 20 enables the Ministry to monitor accredited schemes performances (and recover the costs of doing so). Charges payable for monitoring priority product schemes can be set by regulation under section 22(1)(e).

[40] Breaches are likely to be raised directly to the Ministry by the accredited scheme provider, public reporting and auditing.

[41] Waste Minimisation Act 2008: Compliance, Monitoring and Enforcement Strategy | Ministry for the Environment

Table 10: Proposed legislative obligations for regulated refrigerant stewardship scheme participants

Regulation	Legislative authority	Obligation	Offence	Monitoring	Example of CME tool application (examples are indicative only)
Importers and retailers - *The producer or importer of bulk Refrigerant and of Refrigerant contained in pre-charged equipment* - *Retailers and wholesalers who sell Refrigerant and equipment containing Refrigerant*					
Sale in accordance with an accredited scheme	Regulation set under WMA 22(1)(a) and enforced by Ministry CME team	People who sell or distribute Refrigerants or equipment, first placed on the market, must participate in an accredited scheme and comply with its requirements. The requirements will be published on the Ministry website	An importer or retailer commits an offence if they do not register with an accredited scheme before selling refrigerants, or if they do not comply with its requirements	The Ministry will request data from NZ Customs Service under section 24 of the WMA to identify a list of refrigerant importers. Other sources, for example Consumer NZ, would be consulted if deemed necessary. The Ministry will cross-check this list with the list of scheme participants provided by the accredited scheme	Persons prosecuted and convicted of an offence are liable for a fine of up to $100,000.
Restriction on sale of refrigerant	Regulation set under WMA 23(1)(b) and enforced by Ministry CME team	Refrigerant retailers must only sell refrigerant to a technician who provides evidence they participate in an accredited scheme and meet the qualification requirements set by the accredited scheme	A retailer who sells refrigerant to an unqualified technician commits an offence.	The Ministry will set record-keeping requirements (under s23(1)(i)) to monitor and enforce the requirement. Retailers must keep records of the people who purchase refrigerant and whether they provided verification that they meet the qualification requirements. The Ministry's CME team can access these records on request.	Persons prosecuted and convicted of an offence are liable for a fine of up to $100,000.

Regulation	Legislative authority	Obligation	Offence	Monitoring	Example of CME tool application (examples are indicative only)
Refrigerant technicians *Technicians (including automotive refrigerant technicians) who install, service, maintain, and decommission refrigerant-containing equipment. Technicians who fill and recover refrigerant*					
Restriction on sale of bulk refrigerant	Regulation set under WMA 23(1)(b) and enforced by Ministry Compliance Monitoring and Enforcement (CME) team	Technicians who purchase bulk refrigerant-containing equipment must meet qualification requirements, as set by the accredited product stewardship organisation and published on the MfE website.	A person who purchases refrigerant who does not meet the PSO qualification requirements commits an offence.	The Ministry will set record-keeping requirements (under s23(1)(i)) to monitor and enforce the requirement. Retailers must keep records of the people who purchase refrigerant and whether they provided verification that they meet the PSO qualification requirements. The Ministry can request these records for inspection, in the cases where they detect non-compliance.	Persons prosecuted and convicted of an offence are liable for a fine of up to $100,000.
Quality standard for end-of-life refrigerant product	Regulation set under WMA 23(1)(g) and (h). The Ministry CME team has responsibility for enforcement.	Technicians who decommission refrigerant-containing equipment and recover refrigerant and arrange for its disposal must meet the qualification requirements as determined by the accredited scheme.	A person who decommissions refrigerant-containing equipment or recovers refrigerant who does not meet the PSO qualification requirement commits an offence.	The Ministry will set record-keeping requirements (under s23(1)(j)) to monitor and enforce the requirement. Technicians must keep records of the quantity of refrigerant disposed, and method for disposal. The Ministry can request these records for inspection, in the cases where they detect non-compliance.	Persons prosecuted and convicted of an offence are liable for a fine of up to $100,000.
Disposal of refrigerant only permitted through full denaturing	Regulation set under WMA 23(1)(a). Local authorities have	Technicians who recover refrigerant must ensure it is disposed of through a method that ensures full	A person who vents refrigerant to the environment or disposes of refrigerant through a	The Ministry will set record-keeping requirements (under s23(1)(j) to monitor and enforce the requirement. Technicians must	Persons prosecuted and convicted of an offence are liable for a fine of up to $100,000.

Regulation	Legislative authority	Obligation	Offence	Monitoring	Example of CME tool application (examples are indicative only)
	responsibility for enforcement.	denaturing (e.g., plasma arc facility).	method other than full denaturing, commits an offence.	keep records of the quantity of refrigerant disposed, and method for disposal. The Ministry can request these records for inspection, in the cases where they detect non-compliance.	
Owners of HVAC equipment					
Quality standard for end-of-life refrigerant product	Regulation set under WMA 23(1)(g) and (h). Ministry CME team has responsibility for enforcement.	Owners of refrigerant-containing equipment reaching end of life must ensure a qualified technician recovers refrigerant from the equipment before the equipment is disposed.	A person who disposes of refrigerant-containing equipment without recovering the refrigerant commits an offence.	The Ministry will set record-keeping requirements (under s23(1)(j)) to monitor and enforce the requirement. Technicians must keep records of the quantity of refrigerant disposed, and method for disposal. The Ministry can request these records for inspection, in the cases where they detect non-compliance.	*Infringement fee* - up to $100,000 value for individuals or corporates if they dispose of refrigerant-containing equipment without arranging for a qualified technician to recover the refrigerant before disposal.
Disposal of refrigerant only permitted through a designed facility	Regulation set under WMA 23(1)(a). Local authorities have responsibility for enforcement.	Owners of refrigerant-containing equipment must arrange for the disposal of refrigerant through full denaturing (e.g., a plasma arc facility).	A person who vents refrigerant to the environment or disposes of refrigerant through a method other than full denaturing, commits an offence.	The Ministry will set record-keeping requirements (under 23(1)(i)) to monitor and enforce the requirement. HVAC equipment owners must keep records of the quantity of refrigerant disposed, and method for disposal. Local authorities can request these records, in cases where they suspect non-compliance with the	*Infringement fee* - up to $100,000 value for individuals or corporates if they dispose of refrigerant-containing equipment without arranging for a qualified technician to recover the refrigerant before disposal.

Regulation	Legislative authority	Obligation	Offence	Monitoring	Example of CME tool application (examples are indicative only)
				requirements OR they must provide evidence to plasma arc facility/accredited scheme drop off facility that a qualified person has recovered the gases and arranged for its disposal.	
Consumers					
Purchase of refrigerant	Regulation set under WMA 23(1)(b) and enforced by Ministry (CME) team	Bulk refrigerant can only be purchased by qualified technicians. Consumers must provide evidence a qualified technician is installing equipment containing refrigerant (e.g. heat pumps).	A person who purchases bulk refrigerant without meeting qualification requirements set by the PSO commits an offence.	The Ministry will set record-keeping requirements (under s23(1)(i) to monitor and enforce the requirement. Retailers must keep records of the people who purchase refrigerant and whether they provided verification that they meet the PSO qualification requirements. The Ministry can request these records for inspection, in the cases where they detect non-compliance.	Persons prosecuted and convicted of an offence are liable for a fine of up to $100,000

Appendix A: Further detail on the Status Quo

Background

143. Synthetic refrigerants are human-made refrigerants. They have physical properties that allow them to be used to change the temperature of the surrounding environment. Refrigerants are an essential component of refrigerators, freezers, heat pumps, and air-conditioning units.

144. Fluorinated gases (F-gases) are a class of fluorine-containing compounds that are gaseous at room temperature. There are four classes of F-gases, including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3). In New Zealand, F-gases are largely hydrofluorocarbons (HFCs), which are primarily used as refrigerants.

145. In 2020, the Associate Minister for the Environment declared refrigerants as a priority product. Refrigerants declared a priority product are all refrigerant gases (including SF6) used for heating, cooling and air conditioning that are:

- Ozone depleting substances for the purposes of the Ozone Layer Protection Act 1996 (OLPA), for example, chlorofluorocarbons (CFCs).
- Synthetic greenhouse gases under the Climate Change Response Act 2002 (these are hydrofluorocarbons (HFC) and hydrochlorofluorocarbons (HCFCs)).[42]

146. Products are declared a priority because of:

- The risk they pose to the environment when they become waste.
- The benefits from reduction, reuse, recycling, or treatment are significant.
- The product can be effectively managed under a product stewardship scheme.

147. Synthetic refrigerants have high global warming potential (GWP) and/or are ozone depleting properties. GWP is a measure of a substance's ability to absorb heat relative to carbon dioxide. A low GWP is considered to be below 150 and a high GWP to be above 750. Substances with GWPs between 150 and 750 are considered to have intermediate GWPs

148. The declaration also captures products containing these gases. However, the priority product declaration and refrigerant regulations do not capture natural refrigerants.

149. Natural refrigerants, in some situations, can be used as an alternative to synthetic refrigerants. Natural refrigerants are substances that occur directly in the environment. Examples of natural refrigerants include hydrocarbons (such as propane or isobutane), carbon dioxide, and ammonia. Natural refrigerants generally have a low GWP and are usually more affordable than synthetic refrigerants. They are not covered under the priority product declaration.

150. However, they often have properties that can make them difficult or dangerous to handle. For instance, hydrocarbons are highly flammable, carbon dioxide requires high-pressure systems, and ammonia is toxic and corrosive. The range of risks associated with natural refrigerants is a barrier to wider use.

151. In New Zealand, phasing out of synthetic hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) began in the 1990s under the Montreal Protocol—a global

[42] New Zealand Government (2020), *Declaration of Priority Products Notice 2020*, accessed at: https://gazette.govt.nz/notice/id/2020-go3343

agreement to phase out almost 100 synthetic ozone depleting substances. Ozone depleting substances are synthetic gases that destroy the ozone layer once they get to the ozone layer. They include HCFCs and CFCs. While HFCs have a high GWP, they are not ozone depleting substances.

Government and industry initiatives underway at present

New Zealand's first emissions reduction plan (ERP)

152. New Zealand's first ERP was released in May 2022. It contains strategies, policies, and actions to achieve New Zealand's first emissions budget as part of the global effort to limit temperature rises to 1.5 degrees Celsius above pre-industrial levels. The emissions budget requires New Zealand to reduce greenhouse emissions by an extra 11.5 Megatonnes of Carbon Dioxide equivalent (Mt CO_2-e) by 2025.

153. The ERP's Chapter 16 states that "*by 2050, Aotearoa New Zealand will have transitioned away from fluorinated gases (F-gases) with high global warming potentials (GWP), while safeguarding activities that currently rely on F-gases, such as refrigeration and heating"*.[43]

154. In the ERP, the Government sets a target for the F-gas sector of limiting F-gas emissions to 5.8 Mt CO_2-e from 2022 to 2025 compared to an estimated 7.2 Mt CO_2-e without the initiatives in the ERP. To do this, three key actions have been set:

- Build the capability to shift to alternative low-emission refrigerants and develop training and accreditation for handling alternative gases.
- Prohibit the import of pre-charged equipment.
- Investigate prohibiting F-gases with high GWP
- Introduce a mandatory product stewardship scheme for refrigerants.

Emissions Trading Scheme

155. The ETS is provided for under the Climate Change Response Act 2002 (CCRA). The CCRA puts in place a legal framework to enable New Zealand to meet its international obligations under the United Nations Framework Convention on Climate Change, the Kyoto Protocol, and the Paris Agreement.

156. Under the ETS, importers and manufacturers of HFCs are required to offset their emissions by obtaining New Zealand Units (NZUs). Importers and manufacturers pass ETS costs down the supply chain to retailers, who then pass their cost onto consumers in product purchase prices. Consumer prices are significantly impacted because levies on bulk HFCs are applied based on GWP i.e. HFCs with higher GWPs incur higher costs. The costs of these gases will track with the price of carbon.

157. The Climate Change (Other Removal Activities) Regulations 2009 provides the ability to obtain NZUs for the export or destruction on HFCs. By doing so, these regulations provide monetary incentive to remove or destroy HFCs.

158. NZUs earned— from the export of HFCs for destruction—by the current regulated product stewardship scheme have been held in reserve when the NZU price was low. Since 2022, some of these have been traded by the current scheme to:

- Incentivise gas collection.

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[43] Ibid

- Commission an onshore plant to destroy F-gases.
- Expand the scheme support sector training certification.

The Synthetic Greenhouse Gas Levy

159. In 2013, the SGG Levy was introduced to set an emissions price for F-gases in imported pre-charged equipment and vehicles for which the ETS is not applicable. The SGG Levy price is set relative to NZU prices within the ETS.

160. Revenue from the SGG Levy goes directly to the Crown and is not available to fund collection and destruction of F-gases or to establish product stewardship schemes. However, NZU credits received by the accredited scheme for removal of gases from New Zealand through export or destruction has been liquidated to provide funding for the scheme. The number of NZU credits received is linked the GWP of the gases removed and the income received is based on the market price of carbon.

The Waste Minimisation Act 2008

161. The WMA's purpose is to encourage waste minimisation to protect the environment from harm and provide environmental, social, economic and cultural benefits.

162. The WMA includes product stewardship provisions. These provisions aim to encourage, and in certain circumstances require, the people or organisations involved in the life of the product to share responsibility for:

- Ensuring there is effective reduction, reuse, recycling, or recovery of the product.
- Managing any environmental harm arising from the product when it becomes waste.[44]

163. The WMA provides a framework to accredit mandatory product stewardship schemes for products that have been listed as "priority products". Regulations can be made to control or prohibit the sale and disposal of priority products, require take-back services, set fees, require labelling of products, set quality standards, and impose information requirements.

164. 'Waste' and 'disposal' are defined under the WMA such that the product stewardship regulatory options for gases are limited. The WMA has limited regulation making powers for imposing controls during the lifecycle of "use" of a product. In this instance, before gases (or products they are contained in) become waste.

165. Instead, the regulation making powers mostly relate to end-of-life disposal of gases. For example, it is not possible to regulate the refilling (or the management of refilling) while in ordinary use and before the point of disposal. However, the WMA does allow for restrictions on the purchase of the gases. The WMA allows regulations to be made restricting the purchase of gases, requiring industry to participate in an accredited scheme, and setting quality standards for end-of-life management. We expect the combination of these regulations would impact emissions in the wider cycle of use for the gases.

166. Government declared refrigerants and other synthetic greenhouse gases a priority product under the WMA in 2020. The declaration means a priority product stewardship scheme must be developed. It also enables regulations to be made to mandate acting in accordance with the scheme.

167. In 2020, an industry-led co-design working party proposed a regulated scheme design, and recommended supporting regulations, targeting synthetic refrigerants including F-gases. The group recommended requirements for skills, widened coverages to other sectors using F-gases (e.g. automotive air conditioning and heat pumps), and the

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[44] Parliamentary Counsel Office. (2023). *Waste Minimisation Act 2008*.

significant expansion of F-gas collection for destruction. The proposal was informed by data on the voluntary scheme performance reporting, New Zealand-specific industry experience, and considerations informed from looking at the effectiveness of models used in regulated schemes overseas.

168. In 2022, the Ministry consulted on proposed regulations to support a priority product stewardship scheme for refrigerants and other synthetic greenhouse gases based on the co-designed proposal.[45]

The Kigali Agreement to the Montreal Protocol

169. The Kigali Amendment to the Montreal Protocol requires parties to limit their consumption of certain HFCs by specified amounts between 2019 to 2036. It limits bulk net imports of HFCs but does not restrict the import of equipment pre-charged with HFC refrigerants.

170. As a party to the Kigali Amendment, New Zealand is currently in the process of reducing HFC imports. New Zealand will phase down the net supply of new bulk HFCs to 52 per cent below a baseline level in 2025 and 75 per cent below in 2031.[46]

Industry-led voluntary product stewardship

171. In 1993, the Trust for the Destruction of Synthetic Refrigerants (the Trust) established a voluntary product stewardship scheme, Refrigerant Recovery, for synthetic refrigerants. Refrigerant Recovery was initially funded by a voluntary levy paid by most of the major importers of bulk refrigerants. Since 2022, the levy was discontinued and the scheme is now funded with NZU credits.

172. Refrigerant Recovery was accredited by the Minister for the Environment under the WMA in 2010 and reaccredited in 2017.The scheme established a national system to collect and destroy synthetic refrigerants and exported the gases to Australia for high-temperature destruction. Refrigerant Recovery has recently been rebranded as Cool-Safe. An application for reaccreditation of the upgraded scheme has been submitted.

173. In the 2022/2023 financial year, Cool-Safe collected approximately 38 tonnes and destroyed approximately 20 tonnes of refrigerant gases of all types. Refrigerant gases have historically been exported to Australia for destruction. The quantity of gases destroyed is limited by access to bulk gas storage containers and capacity in shipping and the destruction plant and varies across years. Around 70 per cent of gases recovered and destroyed are HFCs. This has reduced emissions of ozone depleting substances by 360 tonnes and avoided approximately 43,000 tonnes of CO_2 equivalent entering the environment.

[45] Further details of the scheme design can be found in Appendix 2 of the public consultation document on proposed product stewardship regulations for F-gases Proposed measures to reduce the environmental impact of fluorinated gases: Consultation document | Ministry for the Environment

[46] OLPA (2018). Ozone Layer Protection Act Regulations at 10/12/18 Schedules 6+1AA, relating to a High Court amendment

Table 11: Refrigerant collected and destroyed by Cool-Safe

Year	2017/18[47]	2018/19[48]	2019/20[49]	2020/21[50]	2021/22[51]	2022/23[52]
Total amount collected.	38,624 kg	32,573 kg	37,417 kg	30,951 kg	33,168 kg	38,481 kg
Total amount destroyed.	39,086 kg	7,482 kg	45,820 kg	9,162 kg	53,403 kg	20,125 kg
Total ozone reductions.	11,400 tonnes	1,000 tonnes	3,000 tonnes	1,950 tonnes	3,852 tonnes	360 tonnes
Total CO_2 equivalent avoided.	90,100 tonnes	16,000 tonnes	101,000 tones	20,500 tonnes	127,000 tonnes	43,000 tonnes

The current state of training and licensing

174. The Institute of Refrigeration, Heating and Air Conditioning Engineers (IRHACE) and Climate Control Companies Association of New Zealand (CCCANZ) with funding provided by the refrigerant levy collection established the Refrigerant License Trust Board in 2011, which operates under the name Refrigerant License New Zealand (RLNZ). RLNZ initially developed and provided refrigerant filler and handler training and certification. It has since expanded its activities to provide a wider range of training, technical education, and professional development for the industry.

175. Refrigeration technicians can complete a National Certificate, which includes training modules on the installation, repair, and maintenance of refrigerants, however this is not compulsory. The only mandatory qualification is an approved filler training course to fill

[47] Refrigerant Recovery, Product Stewardship Scheme Annual Report to the Minister for the Environment for the Year ended 31 March 2019, accessed at Trust for the Destruction of Synthetic Refrigerants - 2019 Annual Performance Report.pdf (irhace.org.nz)

[48] ibid

[49] Refrigerant Recovery, Product Stewardship Scheme Annual Report to the Minister for the Environment for the Year ended 31 March 2021, accessed at Recovery-Product-Stewardship-Scheme-Reporting-to-Minister-2021.pdf (refrigerantrecovery.co.nz)

[50] ibid

[51] Refrigerant Recovery, Product Stewardship Scheme Annual Report to the Minister for the Environment for the Year ended 31 March 2022, accessed at 1669781971-rr-annual-report-2022-final.pdf (datocms-assets.com)

[52] Cool-Safe, Product Stewardship Scheme Annual Report to the Minister for the Environment for the Year ended 31 March 2022, accessed at https://www.datocms-assets.com/79297/1701641714-cool-safe-annual-report-2023.pdf

containers with gases under pressure. The approved filler course is a generic one-day training course not specific to the needs of refrigeration technicians.

176. A total of 16,775 persons are estimated to work on equipment containing F-gases in both stationary and mobile applications in New Zealand. This group consists of:

- 4,214 technicians registered as Approved Fillers under the WorkSafe framework and have basic entry-level skills. Approximately 1,100 of these technicians also have New Zealand Qualifications Authority (NZQA) qualifications.[53]
- 3,200 licensed electricians.[54]
- 1,775 automotive HVAC technicians.[55]
- The remaining 7,586 are considered to have no formal training.[56]

177. An unknown quantity of all technicians working on synthetic refrigerants have received informal training, equipment manufacturer approved workplace training, or overseas certification. It is unknown whether these forms of training have been updated for recent industry developments in equipment and available gases.

178. The remaining workforce is considered by industry sources to have insufficient competence to reduce the risk of harm from working with equipment containing refrigerant.

179. The proposed framework for High Risk Work Licences in the refrigeration sector included new regulations requiring a licence to be held by all technicians who work on refrigeration, heating, or air conditioning systems in specified high-risk industrial and commercial settings involving hazardous refrigerants.[57]

180. MBIE's legislative regime is focused on improving workplace safety, rather than on environmental risk. The MBIE licensing scheme as previously proposed would only cover people working with F-gas alternative refrigerants with hazardous properties used in specified high-risk commercial and industrial settings.

Other legislation

181. The management of refrigerants is also covered in other legislation. Appendix B outlines this legislation and the regulatory agencies involved.

Stakeholder interests

182. Stakeholders involved with synthetic refrigerants (Appendix C) include companies and organisations representing refrigerants and equipment containing refrigerants. They also include synthetic refrigerant importers, wholesalers and suppliers, retailers, automotive industry, scrap metal recyclers, waste management companies, local

[53] Figures sourced from NZQA and WorkSafe

[54] Figure sourced from industry.

[55] Figure sourced from the Motor Trade Association.

[56] Estimate supplied from above figures and additional information provided in consultation with Cool-Safe, the Ministry of Business, Innovation, and Employment, and key industry players in the heat pump sector.

[57] As of October 2024 this work has been paused pending the outcome of consultation on the work health and safety regulatory system.

government and consumers (individuals, householders and commercial companies).

Appendix B:Legislation relevant to the management of synthetic refrigerants

Table 12 Legislation relevant to the management of synthetic refrigerants

Legislation	Relevance to synthetic refrigerants
Administered by the Ministry for the Environment	
Climate Change Response Act 2002 (CCRA)	The Climate Change Response Act 2002 puts in place a legal framework to enable New Zealand to meet its international obligations under the United Nations Framework Convention on Climate Change, the Kyoto Protocol and the Paris Agreement. The CCRA also provides for the frameworks for New Zealand's greenhouse gas Emission Trading Scheme (ETS) and Synthetic Greenhouse Gas (SGG) Levy.
Waste Minimisation Act 2008 (WMA)	The Waste Minimisation Act 2008 encourages a reduction in the amount of waste we generate and dispose of in New Zealand. The aim is to reduce the environmental harm of waste and provide economic, social and cultural benefits for New Zealand. The WMA provisions include the waste disposal levy, product stewardship, waste minimisation fund, role of territorial authorities and the Waste Advisory Board. The WMA is currently being reviewed, and change has been indicated.
Hazardous substances and New Organisms Act 1996 and Hazardous Substances (classification) Notice 2017	Regulates the use of hazardous substances (including dangerous goods) across their lifecycle (including during transport). Some refrigerants are classified as hazardous substances, especially those with flammable properties.
Ozone Layer Protection Act 1996 (and regulations)	Regulates activities which may modify the ozone layer, phases out ozone-depleting substances and gives effect to New Zealand's obligations under the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer.
Resource Management Act 1991	Regulates activities relating to the discharge of contaminants into the environment (section 15) and duty to avoid, remedy or mitigate adverse effects on the environment arising from the activity (section 17). The RMA is currently under review and change has been indicated.
The Litter Act 1979	Prohibits illegal disposal of equipment containing refrigerant (such as fridges or freezers) on any property without the owner's permission. Monetary fines can range from $1,000 to $20,000. The Litter Act is currently under review and change has been indicated.

Administered by the Environmental Protection Agency	
Basel Convention on the Control of Transboundary Movements of Hazardous Waste	An international agreement that aims to reduce the amount of waste produced by signatories and regulates international transport of hazardous waste. Refrigerants are classified as a hazardous waste.
Administered by the Ministry for Business Innovation and Employment	
Health and Safety at Work Act 2015 and Hazardous Substances Regulations 2017	Sets controls on the use of hazardous and high-pressure refrigerants in workplaces. The Ministry for Business, Innovation, and Employment (MBIE) have proposed regulations to require refrigerant technicians to be trained and accredited to handle refrigerants with hazardous properties in high-risk areas.
Imports and Exports (Restrictions) Act 1998	Controls the importation and exportation of refrigerants and equipment containing refrigerants.
Administered by the Ministry of Transport	
Land Transport Act 1998	An application for registration of a motor vehicle must include the amount of the Synthetic Greenhouse Gas levy (SGG Levy).

Appendix C: Stakeholder groups

Table 13 Stakeholder groups involved in the refrigerant

Producers, importers, exporters and distributors	
Bulk refrigerant importers	Importers of refrigerants that are in single containers and not contained within refrigeration equipment
Pre-charged equipment importers[58]	Importers of new and used equipment that contains refrigerants
Vehicle importers	Importers of new and used vehicles that contain refrigerants
Equipment manufacturers	Those that produce refrigeration equipment within New Zealand and charge it with refrigerants for sale within the country and/or overseas
Wholesalers and retailers, traders and suppliers	People who purchase or export bulk refrigerants or equipment
Others working with refrigerants	
Refrigeration technicians and engineers	Trained and qualified technicians or engineers who install, service and remove gases from equipment
Industry organisations	Organisations that represent professions working in the refrigeration sector and provide services such as training and education
Automotive technicians	A vehicle technician who services vehicle air-conditioning units
Waste management	
Consumers	Householders and commercial entities such as supermarkets, cool stores, dairy farms, owners of air-conditioned buildings, who purchase equipment and engage technicians to install, maintain and decommission the equipment
Waste management and resource recovery	
Automotive dismantlers and scrap metal merchants	A business that breaks vehicles and/or processes equipment into its component parts for resale, recycling or recovery
Collectors	Collects refrigerant from others, such as the accredited voluntary product stewardship scheme
Collection sites	A place where refrigerant technicians and engineers can return unwanted gases
Transfer Stations, Resource Recovery Centres, Landfills	Sites for the temporary deposition, processing or storage of waste materials or for permanent disposal

[58] Pre-charged equipment refers to equipment that is imported already containing refrigerants such as fridges and freezers.

Regulators	
Government agencies	Various government agencies support the management of refrigerants. Refer to Table 13 for a summary of their roles and responsibilities

Table 14 Composition of synthetic refrigerant scheme co-design working group

Sector	Entities represented
Commercial/industrial heating, ventilation, air conditioning and refrigeration	Institute of Refrigeration, Heating and Air Conditioning Engineers (IRHACE)*
	Climate Control Companies Association New Zealand (CCCA)*
	Beattie Air*
	Temperzone*
Automotive air conditioning	Automotive Parts Importers Association (APIA)
Technician training	Refrigerant License Trust Board (operating as Refrigerant License New Zealand)
Bulk refrigerant importers	Chemiplas
Heat pump installers	Heat Pump Suppliers Association (HPSA)*
Automotive sector	Motor Industry Association Incorporated (MIA*)
	Motor Trade Association (Inc.) (MTA)*
	Imported Motor Vehicle Industry Association Incorporated (VIA)*
Project Manager	3R Group Ltd

Note: representatives of those organisations marked with an asterisk were re-interviewed as part of this analysis.

Appendix 4: What sale 'in accordance with' the Cool-Safe scheme may involve for participants

Scheme participants	Persons who sell or distribute synthetic refrigerants or equipment containing them would be expected to:
Wholesalers and retailers of bulk synthetic refrigerants	1. Be a member of Cool-Safe and operate in accordance with its requirements 2. Maintain records and provide data to the Trust on the type and quantity of unused bulk refrigerants they have imported and exported 3. Only sell bulk synthetic refrigerants to a company that is a member of Cool-Safe, or to an individual who can safely demonstrate appropriate training, qualifications, and registration 4. Only dispose of synthetic refrigerants through Cool-Safe 5. Pay advance stewardship fee(s) if any *(none are set for the first period of scheme accreditation)*
Wholesalers, retailers and importers of equipment pre-charged with synthetic refrigerant (includes vehicle importers) Manufacturers and importers of equipment to be charged with synthetic refrigerant (not pre-charged) .	1. Be a member of Cool-Safe and operate in accordance with its requirements 2. Maintain records and provide data to the Trust on the type and quantity of unused bulk refrigerants they have imported and exported 3. Only sell (within New Zealand) split systems that require wiring and pipework installation to: • a company that is a member of the scheme • an individual who can demonstrate they are appropriately trained, qualified and registered • an individual who is working for and being overseen by the wholesaler or retailer who is undertaking the installation themselves • an individual or company where they have contracted a third party to undertake the installation, who can safely demonstrate appropriate training, qualifications, and registration 4. Only dispose of synthetic refrigerants through Cool-Safe Pay advance stewardship fee(s) if any *(none are set for the first seven years of scheme accreditation)*
Technicians installing, testing, maintaining, servicing, or selling equipment containing synthetic refrigerant	1. Be a member of Cool-Safe and operate in accordance with its requirements 2. Pay the appropriate registration fee(s) if any 3. Maintain records of synthetic refrigerant–containing equipment installed, including all the details requested by the Trust 4. Only sell (within New Zealand) synthetic refrigerant–containing systems that require on-site installation of wiring and interconnecting pipework, where they are undertaking the installation themselves using an individual who can safely demonstrate appropriate training, qualifications, and registration 5. Only use appropriately trained, qualified and registered individuals to install, service and decommission split systems or other synthetic refrigerant–containing equipment that require wiring and pipework installation 6. Only dispose of synthetic refrigerants through Cool-Safe

Appendix 5: Training framework proposed by industry-led Synthetic Refrigerant Stewardship Working Group

	Industry Sector	Automotive *CLASS 1, 2, 3 Licence*	Appliance Servicing Technician *CLASS 1 Licence*	Trade Assistant *CLASS 1 License*	Building services Installer L4 *CLASS 3 License*	Airconditioning Installer L4 *CLASS 3 License*	Commercial / Industrial Refrigeration and Air Conditioning (RAC) *CLASS 4 License*
	Title	**National Certificate in Motor Industry (3 qualifications below)**	**New Zealand Certificate in Electrical Engineering**	**New Zealand Certificate in Refrigeration & Air Conditioning (Trade Assistant)**	**New Zealand Certificate in Mechanical Building Services (Trade)**	**New Zealand Certificate in Air Conditioning Installation (Proposed course with NZQA for approval)**	**New Zealand Certificate in Refrigeration and Air-Conditioning (Trade)**
Synthetic Refrigerants and HFOs	**Qualification**	Class 1 Automotive License Class 3 Automotive Dismantler & Collision Repair License Class 2 Automotive License	L3 Pre trade Appliance servicing specific unit standards + Approved Filler	L3 Pre trade	4 YEAR APPRENTICESHIP In development + Approved Filler	2 YEAR Apprenticeship NO electrical Installation focused apprenticeships i.e. more on job + Approved Filler	Level 4 Refrigeration and air-conditioning (RAC) + including Approved Filler +Flammable Awareness Service focused Technical
	Current Unit Standards	981, 3397, 19666, 24443, 24444, 24445, 24446, 24447, 24448, 24449 24451, 24452, 28950, 28952, 29563, 29577, 30565, 31124, 31127	19666, 28952, 28950, 29563	19666, 29563	19666, 26336, 28952, 29563, 28950, 23959, 29563, 22707, 31142	31142,22441, 23959, 22707, 28950, 28959, 19666,28952, 29563	19666, 28952, 28970, 28959 28960, 28965, 28963, 23959 28950, 28953, 3846, 3851 3874, 28956, 29563
	Unit Standards for review		Leak testing - 28953 Jointing – 2679, 23959	Leak testing - 28953 Jointing – 2679, 23959	Leak testing - 28953 Jointing – 2679, 23959	Leak testing - 28953 Jointing – 2679, 23959	Leak testing - 28953 Jointing – 2679, 23959
General	**Permitted activity**	Able to install service and repair or dismantle Automotive Airconditioning Systems. Able to purchase refrigerant Able to recover refrigerant	Able to service appliances containing refrigerant. Only includes system not permanently connected to the build power supply Able to purchase refrigerant Able to recover refrigerant	To handle a refrigerant while undertaking training and/or assessment in a classroom setting and at your work-place under supervision. The supervisor must be the holder of a licence that entitles them to engage in work for which the licensee is being trained.	To handle a refrigerant while undertaking training and/or assessment in a classroom setting and at your workplace under supervision. The supervisor must be the holder of a licence that entitles them to engage in work for which the licensee is being trained.	Able to purchase, install and de-commission air-conditioning PLANT AND EQUIPMENT UP TO 50kW Able to purchase NON HAZARDOUS refrigerant Able to recover refrigerant	Able to purchase, service, install and de-commission air-conditioning and refrigeration equipment. Able to purchase ALL refrigerants Able to recover refrigerant
	License renewal	**5 Years**	**5 Years**	**5 Years**	**5 years**	**5 years**	**5 Years**
	Notes	Unit standards listed, relevant to technicians working with refrigerant only					
		Current Unit Standards to be added are Unit Standards that cover flammable and refrigerant management					