

From: [Glenn Barrett](#)
To: [Kildahl, Linda J. \(ECY\)](#)
Cc: [lwaln](#); [Dumitrescu, Tamara \(ECY\)](#)
Subject: RE: Commercial Refrigeration comments
Date: Wednesday, December 14, 2022 10:55:50 AM
Attachments: [image002.png](#)

Hi Linda, please see my thoughts/opinions below in GREEN... I tried to capture my thoughts in relation to your questions, not sure I met the mark though! We could do a call if you would like to pick Leia and my collective brain, with the goal of hearing what we see/hear contractors, End Users, Engineers, equipment OEM's and refrigerant OEMs are doing/saying.

One other comment is regarding terminology, I apologize if I am mistaken and Ecology is using appliance in the requirements wording. It seems like EPA and for sure CARB are using the term "appliance" for the individual refrigeration system definition (complete circuit, where the refrigerant is contained within the pipes, evaporators, condensers, blah blah blah, and as an entity is one appliance... Each store would have multiple appliances, some small some big). We are seeing people in industry become aware and use the term "appliance" when referring to compliance and refrigeration equipment. Terms like "circuits" "systems" "refrigeration system" can have different meanings in our little industry and cause confusion/non-compliance errors in reporting; the term appliance is new and I think if we all use this term in our compliance language and rules (where applicable) it will help in your transition (the compliance folks from the bigs Krogers, Albertsons, WinCo Foods, Costco.... all use that term now and basically understand what it means in terms of compliance). I would strongly recommend Ecology review the language and verbiage and include/change to using "appliance" everywhere it is applicable and provide a definition to refer to (see CARB for example).

We want to help, we do not have all the answers, we do have valuable insights and experience regarding all things supermarket refrigeration, and we do have Leia. So please feel free to reach out or schedule a call if you would like to chat openly or under NDA.

Regards,

Glenn

Glenn Barrett » www.dcengineering.net
Direct » 208.493.0085 | Gbarrett@dcengineering.net

From: Kildahl, Linda J. (ECY) <LKIL461@ECY.WA.GOV>
Sent: Tuesday, December 13, 2022 5:28 PM
To: Glenn Barrett <Gbarrett@dcengineering.net>
Cc: lwaln <lwaln@refrigerantmanagementsolutions.com>; Dumitrescu, Tamara (ECY) <tdum461@ECY.WA.GOV>
Subject: RE: Commercial Refrigeration comments

Warning: This email originated outside of the DC Engineering email system.
Forward the message to IT Security (infosec@dcengineering.net) if you are concerned or suspicious about the nature of the content.

Hi Glenn,

Thank you for your feedback. Do I understand your comment correctly that we should make a distinction between new and existing facilities because existing facilities will continue to use high-GWP refrigerants if the regulation is too stringent; whereas if we allowed existing facilities more flexibility they would be more apt to make the transition? That is correct. Existing facilities need to have the flexibility to incrementally change/remodel/maintain stores. Supermarkets are not static, and it is VERY capital intensive to change out refrigeration system to meet the lowest GWP requirements of New Facilities. If they don't have this transitory option they will not incrementally change their stores to something more GWP "friendly" because it will be too costly and Technicians are NOT in abundance, so there are resource strains on making "New Facility" big equipment changes to existing facilities as well. The vast majority of

refrigerant out there is in Existing Supermarkets, and when given an economically viable path to changing out the existing stores refrigerant the stores will make the incremental improvements to meet code requirements or economic benefits. Case in point, a refrigerant retrofit from R404a or R507 (worst GWP's and were widely used from 1993 – 2010) to R448A/R449A, will lower the global warming impact by more than 50% and cost \$20k to \$40k, requires one really good tech and one or two “helpers”; a new refrigeration system with lower than 150 or 300 GWP means a whole new system and now we are talking over \$1MM in cost and requires 20 tradespeople or more, plus engineering and equipment, and take over a year from design to start up.

I will certainly edit this item as we want the notes to accurately reflect the discussion. Just be aware that I can easily make the change, but it will take several days to get it posted. We will send a note once the modified notes are posted.

I do have a follow up question though—if our “new refrigeration equipment” definition allows for existing facilities to continue using and making replacements to their existing equipment until they need to (or decide to) replace them—or unless they make changes that would increase the nominal capacity of the compressor, would that reduce your concern?

I think we are very close to the same page, but maybe would swing the pendulum too far in the “don't do anything to lower GWP during remodels” category. I think it is reasonable to allow, and dictate/require, when making changes in existing facilities that increase the capacity of the system or add load to existing system, allow/require under 1400 GWP refrigerants to be used. One thought, that essentially boils it down to “if you want to extend the capacity of your Existing Refrigeration system (more compressors or more case/Walk-in load)” you have to retrofit that system to and under 1400 GWP refrigerant. You could take that one step further than California and say any New Refrigeration system in Existing supermarkets have to be under 300 GWP or 150 depending on size (New Refrigeration System would need to be defined to accommodate the goal and make the requirements; California seemed to center on the facility and I think at this point you could focus on the appliance/refrigeration system itself). Idea is that if a supermarket is changing out the cases and the refrigeration system to something new, it should meet the new store requirements for ultra-low GWP (even if an Existing supermarket) but if they are “revamping” or “re-using” existing equipment they could retrofit out the higher GWP refrigerant for something under 1400.

Have you seen the new proposal from the EPA “Proposed Rule Implementing Technology Transitions Under the American Innovation and Manufacturing Act”? The proposed Table 1 is below. Whatever you do, I would think aligning Ecologies program with what the EPA seems to be driving toward would make transitions smoother and ease public acceptance.

Below is a portion of the EPA's proposed Table 1:

Table 1: Proposed GWP Limit Restrictions on HFCs by Sector and Subsector

Sectors and Subsectors	Proposed GWP Limit	Compliance Date
Refrigeration, Air Conditioning, and Heat Pumps		
Industrial process refrigeration systems with refrigerant charge capacities of 200 pounds or greater	150	January 1, 2025
Industrial process refrigeration systems with refrigerant charge capacities less than 200 pounds	300	January 1, 2025
Industrial process refrigeration, high temperature side of cascade systems	300	January 1, 2025
Retail food refrigeration – stand-alone units	150	January 1, 2025
Retail food refrigeration – refrigerated food processing and dispensing equipment	150	January 1, 2025
Retail food refrigeration – supermarket systems with refrigerant charge capacities of 200 pounds or greater	150	January 1, 2025
Retail food refrigeration – supermarket systems with refrigerant charge capacities less than 200 pounds charge	300	January 1, 2025
Retail food refrigeration – supermarket systems, high temperature side of cascade system	300	January 1, 2025
Retail food refrigeration – remote condensing units with refrigerant charge capacities of 200 pounds or greater	150	January 1, 2025
Retail food refrigeration – remote condensing units with refrigerant charge capacities less than 200 pounds	300	January 1, 2025
Retail food refrigeration – remote condensing	300	January 1, 2025

Thanks again! And let me know if you have questions or if I didn't capture your comment correctly.

-Linda

From: Glenn Barrett <Gbarrett@dcengineering.net>
Sent: Monday, December 12, 2022 1:22 PM
To: Kildahl, Linda J. (ECY) <LKIL461@ECY.WA.GOV>
Cc: lwaln <lwaln@refrigerantmanagementsolutions.com>
Subject: Commercial Refrigeration comments

Hi Linda,

I made some comments related the notes from November 17th meeting (attached). I am open to further discussion if it helps you and your team.

Thank-you for your consideration,

Glenn

Glenn Barrett » www.dcengineering.net
 120 W. Neider Ave | Coeur d'Alene, Idaho 83815
 Direct » 208.493.0085



DC ENGINEERING
Careful listening. Dynamic solutions.

Gbarrett@dcengineering.net