June 12, 2015

Ryan McCarthy, Chair
California Environmental Protection Agency
Air Resources Board
Sacramento, CA

RE: ARB's Preparation of a Short-Lived Climate Pollutant Strategy

Dear Mr. McCarthy

Traulsen, a division of the ITW Food Equipment Group, LLC, in Fort Worth, Texas, U.S.A., appreciates the opportunity to comment on the Air Resources Board's Short Lived Climate Pollutant Strategy Draft Program.

Our organization, together with the efforts of our 400+ employees, were early supporter of the Montreal Protocol by identifying practical solutions to transition from ozone depleting substances (ODS) containing CFC and HCFC refrigerants, to more environmentally friendly options. We are always anticipating our markets needs and work proactively to seek other environmentally sustainable endeavors that promote responsible resource usage, energy savings and overall good stewardship practices.

Currently, we are taking steps to further reduce our greenhouse gas (GHG) output without bringing about a number of unintended consequences that could affect the ability to provide our customers with safe, energy efficient and climate friendly equipment. We have been an active participant providing equipment and comment in many of the California studies like those through Southern California Edison's labs and CEEE. Our current involvement is focused on equipment being reviewed for establishment of energy performance for equipment stands.

In choosing the refrigerants for our specific applications—including a large percentage of which is custom designed to the end users specifications, we are limited to those choices approved by the United States (U.S.) Environmental Protection Agency's (EPA) Significant New Alternatives Policy Program (SNAP). On August 6, 2014, the EPA released a proposed rule in which various HFC and HFC-containing blends previously listed as acceptable alternatives to ozone-depleting substances will have their status changed to "unacceptable" for some uses, and as such would be prohibited for those uses. If the proposed rule is adopted with no revisions, the number of approved refrigerants left for commercial self-contained products in the food service industry will be severely limited. Many commenters to that rule have noted and provided data addressing fundamental concerns with such an aggressive date and limited refrigerant and foam choices.

Therefore, it is our hope that California will review our concerns attached and consider the following in its creation of a proposal:

1. A hybrid approach that deals with phase down targets and sensible GWP limits for remaining substances should be adopted regarding HFC's.
2. All phase-down targets should be set based on reviews of commercially available technology.
3. Food safety and public health are the highest priority in our equipment designs.

4. The overall carbon footprint of the equipment should be considered -- meaning that the equipment's energy usage should not be sacrificed in the process of adopting a strategy that is overly aggressive.
5. The commercial refrigeration category should be addressed by a clear definition of the products application. Some products are not able to use refrigerants such as CO2 in their applications, may have charge limits of 150gr (5.3oz) (i.e. flammable refrigerants) or are regulated as VOC's by other agencies (including in the state of California).
6. Current building codes are fragmented and out of date at the local, state and federal level and many jurisdictions do not allow flammable refrigerants or limit the amount of flammable substances used in servicing.
7. "Retrofitting" is not possible with the use of many refrigerants in the self-contained segment. Therefore, it is important to be clear in the difference between "replace" and "retrofit". We believe that this definition will also be of extreme importance to the supermarket/remote (centralized) refrigeration systems.
8. Any solution for the equipment end-user will be more successful with encouragement though incentives and other voluntary measures.

NEW STAND-ALONE COMMERCIAL REFRIGERATION SYSTEMS

During the EPA workshops and public meetings held over the past year, some participants noted that the prior transition for the commercial refrigeration industry from higher ODP refrigerants to HFC's was a process that took approximately 10 years. It was also noted that the transition appeared to happen at various intervals of "ease" in specific product applications because there were similar coefficients in the performances of the available refrigerant options that directly aided in that effort. Additionally, there were

- No major technology leaps:-components could be considered "Drop in", [1]
- No new safety implications related to flammability,
  - No new safety training implications in production, delivery or servicing,
  - No new production or installation facility changes,
- No energy efficiency program limits, and
- No or limited testing and listing restrictions from safety and sanitation agencies.

Manufacturers prepare to meet market demand based on the ability to operate in a system of "design cycles," with the largest "technology jumps" taking place when standards change or new technology is released. These cycles can run a number of years depending on the scope of the change, the availability of the infrastructure (including commercial availability of components) to support the change, and the number of products in the manufacturers' line that need to be addressed.

This design cycle does not preclude some commercial refrigeration manufacturers from venturing into the exploration of new technologies and spurring market possibilities. However, these ventures should not be mistaken for "market readiness" as many factors—most importantly commercial availability of the new technologies--are not comparable from commercial product application to commercial product application.

Currently, the commercial refrigeration industry, especially manufacturers of ***specialty use*** stand-alone equipment are waiting for the approved use of a number of potential, new lower GWP HFO refrigerant blends to fill the gap between those which agencies seek to eliminate, and the more risky natural refrigerants already approved. Traulsen is aware that there are some approved natural hydrocarbons (HC's) already on the list, both in the U.S. and Canada, and has assessed each option in our various applications. Although this is a very time consuming

[1] Refrigerants are rarely "drop-ins" as hoped. Any changes in performance characteristics require proof of product performance.

process, it should be noted that each possible solution has characteristics not easily applied across the diverse product line.

Traulsen has also noted that the United Nations in its Report of the Technology and Economic Assessment Panel in May of 2014 show that there are not yet significant quantities of non-flammable refrigerant alternatives commercially available. (Technology & Economic Assessment Panel, May 2014[2]). For blend availability and use approval, industries larger than commercial refrigeration will drive supplier demand and all industries will compete for whatever product is available. According to the Green Car Congress, Honeywell announced that it would make additional investments to increase capacity for HFO-1234yf. However, Honeywell went on to say that the "exact size of the plant will depend on supply agreements that Honeywell is putting in place with major customers. " (Green Car Congress, 2014[3]) (Stipe, 2014[4]) Smaller customers who may be able to use this blend option will have to compete against larger customers, like the mobile air conditioning (MAC) industry for supply.

In the U.S., because the EPA has not yet determined a lowest GWP threshold of tolerance, many manufacturers have not been able to decide where and how to dedicate redesign resources. The narrow selection of choices *currently* "approved for use" leaves propane (R-290) and other flammable choices as possibilities for some applications, but not without great thought and planning on how to best implement safely. Under the current U.S. EPA proposal, the exceptionally short timeline challenges the ability of the manufacturers 'ability to undertake this level of planning. Traulsen and some of its sister companies have already made the hard decisions to eliminate certain model lines and products that have been deemed "impractical" to convert.

We believe that too aggressive a date to bring stand-alone refrigeration products to a limit of less than 1700 GWP will push the manufacturers into flammable HC options that the industry is largely unprepared for and many applications are not suited for. These concerns would lengthen the normal design cycle time line—as several steps must take place before any product design is undertaken:

1) A robust risk assessment review must take place regarding many issues including insurance, code allowances, facility updates, process and worker training.

   Manufacturer risk assessment plans operate in cycles tied to annual budgets, insurance policy renewals or may require relocation of the facility or entire lines of production. Unionized plants may require longer time lines as there may be requirements for independent studies to be performed or negotiated.

2) There is a need to consider a multitude of restrictions found in major mechanical, fire and building codes in the U.S. and Canada.

   The process to update the codes within the various independent bodies of the North Americas can take several years to complete. Additionally, these codes can be adopted or amended by various jurisdictions in ways that create a conflict with the intent of the originally published code. Many have "grandfathering" issues that impact products the codes are supposed to safely regulate.

3) Large capital investment to retool factories for use of flammable refrigerants (also referred to as "bomb-proofing").

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[2] Technology & Economic Assessment Panel. (May 2014). *UNEP: MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER* . UNEP.

[3] *Green Car Congress*. (2014, 01 23). Retrieved 10 11, 2014, from Green Car Congress: http://www.greencarcongress.com/2014/01/20140123-honeywell.html

[4] Dave Stirpe. (2014). *EPA SNAP Stakeholders Meeting (Honeywell Statement).* Honeywell International.

Manufacturing logistics, charging, leak detection systems, and final systems' testing need to be designed, purchased and installed in an "explosion proof" station.

For an average size assembly line, gas charging systems can cost as much as $180,000 USD. Like Traulsen, many manufacturers have multiple production lines. Lead time from the original request for the equipment quote of a charge/recovery station until such a system is installed and running is a minimum of six (6) months each. So, in order for manufacturers to initiate factory makeovers, they must plan how to balance installing assembly line changes and lost product output with maintaining enough production to sustain the transition. Traulsen would not make such a transition concurrently with our daily production schedules as this could have significant impact on our production facility and workforce.

4) Engineering resources are limited.

We estimate that each product line when re-designed in a normal design cycle would take approximately one year of concentrated development effort per basic model. This estimate assumes that the refrigerant and components necessary are ***commercially available***, and that the design/performance review of the product and approval testing goes according to plan. This phase of the development cycle does NOT include other internal steps—some that may be concurrently performed. It also does not include the market/customer review and acceptance process which is described later.

5) The commercial refrigeration industry needs to have compressor prototypes and alternate refrigerant blends available for new product development.

In the absence of these two performance variables, we are forced to wait until they are available before our product redesign and engineering can begin. According to our current compressor suppliers, many of their own product conversions are "in process", waiting both for the approval of the EPA for new refrigerants and for the commercial availability of new refrigerants options.

Once the compressor manufacturers have completed their own approvals, which can take up to one (1) year, they will begin to move forward supplying the market based on demand. By any industry experience, this means that suitable compressors will not immediately be commercially available to support R&D efforts for some time. This will greatly impact all industry products, and particularly low volume applications that will face elimination as "impractical" based on the efforts needed to convert which will cascade down to the manufacturers that previously depended on those compressors. Traulsen has verified lead time estimates of over a year for our specific compressor availability and suspects that the true time frame for the compressor companies to declare their products to be "commercially available" to be 2-3 years total (meaning that compressor suppliers will not have adequate HC or HFO-engineered options to cover our product lines). This roadblock is exponentially worse for smaller manufacturers. Traulsen cannot meet an aggressive deadline in any equipment class where the technology is NOT now commercially available to design products for a wide variety of applications—primarily freezing applications and those products which fall into a 150gr charge limit of flammable refrigerants.

6) "Engineer to Order" Products follow a more complicated design cycle.

An additional concern is that a large number of Traulsen products are "engineer to order" or built specifically for a customer's required application. Unique customer field testing and approval is a part of the normal engineering design cycle. Among other things, the customer approval cycle is driven by purchase contracts, budgets, and store construction schedules. This multi-step process provides challenges for manufacturers to meet customer acceptance of the changes in their products under the proposed effectivity date.

Moreover, the proposed rule undercuts energy efficiency objectives, because even more time is needed to perform field testing where an "engineer to order" customer requires NRCAN/Energy Star Compliance as a part of its purchasing agreement. As an example of an average timeline, we currently have a project unrelated to the any current proposed rules that has a nine (9) month field test before final customer approval.

7) Safety/Sanitation Compliance (3RD PARTY TESTING ISSUES)

Once the manufacturers are able to approve a design and test for performance, the next hurdle is to gain the approvals from the various laboratory test agencies that are necessary to place the equipment on the market. Most of our products are covered under the standards CAN/CSA 22.2 No. 120, UL 471 and NSF 7 for safety and sanitation. Additional efficiency and performance approvals, as outlined by DOE for energy efficiency, NRCAN, and Energy Star, and are either mandatory or are required by our customers.

While we have heard mixed claims from the various, larger 3rd party labs which hold the proper ISO certifications in our standards families required to do agency testing, Traulsen knows from experience that the promotional materials for many labs outline their entire organization operating system with numbers reflecting the full complement of employees in that organization. In reality, not all employees or locations are certified to run the complement of approval tests included as required by the standards. For example, we recently had to fly an auditor to our location in Texas from New York because there were no local auditors ISO approved for a particular task.

Current testing and file certification approvals require an average of three to four months per product family to gain the proper approvals mix—unless paying for accelerated services—for companies that are part of a program requiring "witness testing" or lack an internal lab. This timeframe normally is less for a company that is part of an ISO 17025 approved lab program. However, due too many competing standards updates, components being developed and major reorganizations at several of the big three labs, has drawn that time out considerably.

Companies that maintain their own internal lab may need to expand their laboratory certification scopes and purchase the equipment necessary to run testing for flammable products (if they have not already done so). This cost of scope expansion, is multiplied by the number of internal lab certification approvals the company carries—(i.e., CSA, CE, UL, ETL, and NSF or any combination thereof).

The cost of 3rd party testing and approvals has been quoted in the range of $8000-$16,000 USD depending on the product family, number of component or material changes and the refrigerant selected. Sanitation and energy testing will increase those costs,--doubling the range in some product families.

Traulsen estimates that, barring any constraints in the system for laboratory testing, obtaining lab approvals for the ***512 base models families*** we manufacture will take approximately 3 to 5 years (not counting the completion of the development and the customer approval cycles).

Thus, as a result of the proposed timelines and other standards, independent certification labs will either need to ramp up their testing capacities by investing in additional local certifications and hire QUALIFIED, EXPERIENCED staff to meet the demand or certification work will simply pile up with larger customers being able to secure resources to move forward. Customers, including Traulsen are already notifying their labs of their expectations but without products ready to test we are faced with concerns. Ultimately, these challenges will be faced by all manufacturers regardless of size and severely complicate the entire commercial refrigeration industry's ability to even complete existing regulatory approvals.

8) Customer Support Challenges

Part of the product design cycle also includes establishing customer support and service protocols. Internally, when businesses like Traulsen are involved in a normal design cycle, we assess the readiness of many customer contact points including training, operating materials, labelling, websites and how the channel between ourselves and the end user is to be handled. We must also build a spare parts inventory for the new systems, plan for trapped inventory and make sure that there are no special limitations or regulatory requirements for shipping parts out to our network.

While much of this is developed concurrently with the engineering design process, making sure the market is ready is not a process that we would consider rushing to complete. The process to establish support and service protocols cannot be accomplished until product design cycles are complete.

If the refrigerant selection for stand-alone refrigeration is limited due to the constraints of the proposed timeframe and we are forced to make the selection of a flammable refrigerant, we anticipate the need to lengthen this step of the design cycle beyond the previously stated 3 to 5 year timeframe to cover issues within the service network—in this case because Traulsen does not maintain an internal service network.

In light of the steps of a normal design cycle, Traulsen believes that the commercial refrigeration industry, specifically the stand-alone equipment market, should be given either a longer timeline to determine the best options available or have the consideration of a higher GWP allowance for such a drastic design cycle change. The equipment covered under the commercial refrigeration category has far less impact from its contribution to overall GHG emissions than some of the other categories as defined and an allowance for our industry to consider new blends that are potentially set for release will help reach the same desired outcome.

Traulsen has heard the comparison of many groups supporting the aggressive timelines for the various industries in the consultation, especially where the “safety record” of the flammable refrigerants in use in the European Union has been over relied on for setting the removal of non-flammable high GWP refrigerants. We would like to point out that there are significant differences in business practices of EU and North America which must be considered before limiting the number of nonflammable options. For example, the regulatory bodies that oversee topics such as building code and occupancy limits are not comparable for the various proposals, including requirements for safe handling during equipment repair. For example, the US allows open pilots in many kitchens where equipment containing flammable refrigerants would be installed.

OTHER REFRIGERATION ALTERNATIVES CONSIDERED & OBSERVATIONS

In light of comments above outlining an average design cycle and other key considerations, we now examine other available refrigeration options and potential unintended consequences.

1. Flammable refrigerant options are limited to 150 grams per system. While this may work in smaller applications, the proposed rule fails to account for products using charge sizes in excess of that amount.

   Traulsen estimates that more than 40% of our equipment line will need systems that exceed the 150 grams limit in refrigerant capacity. Thus, in order to continue manufacturing products that exceed the charge size, manufacturers must install multiple sealed systems into the product. This sacrifices both energy efficient and economic value to the customer.

   A second, unintended consequence of the charge size limitation is that existing controls may have to be redesigned and approved. If a new controller needed to be designed, a similar design cycle for the process would apply, but the cost of the approvals and the price to the market would increase dramatically.

   Further still, the proposal does not consider the unintended consequences of multiple systems within a cabinet that could leak or experience a catastrophic failure.

Traulsen asks that large stand-alone unit above 5,000 BTU's or requiring two (2) or more systems to operate because of the 150 gram limit be allowed an exemption in order to continue using their current refrigerants for at least five (5) years beyond the final rule date adopted by California.

This narrow use exemption would allow for manufacturers to concentrate their efforts on the equipment that could transition more easily without penalizing the stand-alone market as a whole.

2. Propane (R-290) and Isobutane (R-600a) are listed as Volatile Organic Compounds (VOC's) which are regulated by various authorities. VOC's have been targeted for reduction by the U.S. EPA for some time as VOC's released to atmosphere are known to contribute to the production of ground level ozone when they react with sunlight. Since there is always some potential for leaks, the increase in use of either of these options could increase the amount of ground level ozone. Manufacturers and other servicing contractors have pointed out their concerns that this could cause penalties to be assessed for VOC release violations on manufacturers, end users and service contractors. We are still assessing the impact of VOC's under California laws.

3. Traulsen has chosen not to pursue Ammonia (R-717) because of its corrosion factors and issues related to ventilation requirements for the equipment in various locations.

4. CO_2 (R-744) technology is not familiar in most manufacturers in the US. An article written by Andre Patenaude, Director of CO_2 Business Development for Emerson Climate Technologies, cited a 2013 world map put together by the Shecco organization which showed three (3) CO_2 Transcritical Supermarkets in the US.[5] The same map showed 102 Cascade Secondary Supermarkets. While we expect the numbers to increase over the next five years, we do not believe that this low number signifies mass market adaption of the technology or commercial readiness of the U.S. component suppliers. In an informal survey of other CRE manufacturers it is widely reported that components are being sourced outside of the United States due to availablity.

   CO_2 (R-744) systems require significantly more complex redesign and hardware. It would be hard to imagine that many companies would be able to employ this technology in new, especially low temp stand-alone niche applications in the near future.

   Traulsen is not aware of any commercially available CO_2 compressors for ***self-contained freezer applications*** at present. Therefore, we have eliminated CO_2 as a viable solution in our products.

5. Traulsen research of its product line shows that at present, there are no commercially available HFO compressors in the North American standard voltage 115VAC/60Hz for its freezer and refrigerator. We continue to work with our vendors to change this.

FOAM BLOWING AGENTS

Many manufacturers have set their conversion targets for removal of HFC-134a and other foam to align with the European F Gas Regulations. Any gap in dates will seriously affect the industry as they are now faced with the acceleration in foam fixture production, product development, testing, regulatory approval and customer validation schedule.

[5] Patenaude, A. (2014, 6). Making Sense of Natural Refrigerants. *E360 Outlook*, p. 5.

As with refrigerants, the ability to convert to a new form of foam blown insulation in our products is a major undertaking. Most companies would probably undertake either a conversion of refrigerant or the insulation in separate actions to make sure that the overall energy efficiency of the products were the most efficient possible. Rather than restate the points related to the design cycle that apply to foam blowing agents, we will highlight the key points that affect many organizations such as Traulsen in the use of foam.

While some of the foam offerings today are non- or low-flammable, others do not become stable until mixed while passing out of the refrigerant gun on the production line—therefore, use of these refrigerant options will require explosion proof guns.

In cases where companies must change foam suppliers the cost can be prohibitive as shown in the following example:

> Supplier "A" leases their tank system to the manufacturer and the company owns its guns (approx. $10,000/ea. multiplied by the number of manufacturing lines) but at a minimum, these must be replace because they are not explosion rated.
>
> Supplier "B" requires the company to buy the tanks (estimated at $100,000 per tank) but the company may lease the guns from the supplier.

Traulsen is experimenting with several alternatives which are not yet commercially available. We have just begun our research and planning with our hazard analysis team to determine if the products being considered require any special handling for pressure, VOC ventilation and flammability based on the threshold values within the plant and in storage. This is necessary to determine if we would require another facility expansion. We are concerned that attempting to meet a date more aggressive than that of the EU would not allow us the time to adequately assess the options.

This concern has been supported by other testimony and published comments made in the U.S. For example (from an EPA Public Meeting held in Washington, D.C on August 27th, 2014):

> "We are also concerned about the availability of the new blowing agents. HFO products are available from Arkema and Honeywell with another product from DuPont pending TSCA approval. These manufacturers can comment on commercial status and quantities of available products. The indications that we have been given are that the available supply as of 1 January 2017 will be insufficient to meet the needs of the affected industries. The alternative low GWP blowing agents that are readily available right now are either flammable or do not provide adequate insulation properties. There is a large capital investment and several years to implement flammable blowing agents for a customer that does not currently have that capability."[6]
>
> "We have already implemented *low* GWP blowing agent changes at some of our largest customers. These conversions took approximately five (5) years to complete. Conversions at our small customers will likely be last. We simply do not have the time or resources to ensure a smooth transition to the new blowing agents." [7]
>
> "During all of the blowing agent changes, a great deal of formulation work is always necessary. In almost every case, a change in the blowing agent requires a major formulation change to provide a product that works for our customers. The previous changes from CFCs to HCFCs and then to HFCs was not easy and

[6] Mike Krupa. (2014). *EPA Public Meeting.* BASF Corporation.

[7] ibid

did not occur without a lot of challenges. There was a lot of cost incurred due to trials, production runs, and higher levels of scrap until the formulations could be optimized for each customer."[8]

DuPont noted in its Public Comments[9] that the transition date for several foam insulation segments might be faster than the market could reasonably manage.

Traulsen is concerned that remaining foam options may not support the current energy efficiency goals in our products. Changes in the thermal properties in the available foam products due to a lower efficiency of the product could affect cabinet dimensions (increase of wall thickness), of great significance to the end user. If the loss in interior volume or increase in footprint were acceptable to the end user, the market would drive need for new foam fixtures.

The industry has a limited number of foam fixture producers. Therefore, as each set of fixtures is reviewed and redesigned, we will all compete for limited services, increasing demand which will affect the price of obtaining those services. The additional cost of moving to a thicker panel will mean that it is not backward compatible with the existing designs and will affect the lifecycle cost of the equipment related to retrofitting, repair and maintenance unless manufacturer continues to create older panels for service stock.

In a recent rulemaking for U.S. DOE, Traulsen pointed out that if a manufacturer is forced to redesign all of its fixtures used in production of energy efficient commercial refrigeration equipment, it would have to account for the impact of the cost and number of foaming fixtures, engineering design costs and the cost of foam. Each fixture is designed for specific types of product, foam and ambient condition of use. Like other industries that have provided estimates of the fixture replacement to the both the U.S. EPA and DOE, Traulsen has made estimates that the average lead time for it to build fixtures in-house is about 5 to 6 months each. The installation time would then be approximately two weeks each on a dormant line. Including door fixtures, we have more than 65 fixtures. Traulsen has an 11 year time estimation to do the work in-house if it is unable to compete for resources in the fixture market.

We are also concerned about the impact on product quality and production throughput of some of the remaining options, including:

- Formic acid blends have corrosive properties that would affect the metal—most importantly copper refrigerant lines in our design.

- Pentane based blowing agents require all foam fixtures and processes to be redeveloped due to the flammable nature of the refrigerant.

- Water based blowing agents are environmentally friendly but suffer from poorer insulation performance and are also more affected by processing temperature which requires improved control of fixture temperatures. Traulsen has not considered this option because of the additional environmental impact from increased water consumption, energy consumption to heat the fixture and waste water.

[8] ibid

[9] Michael Parr. (2014). *EPA Public Meeting Statement.* DuPont.

- Methyl Formate, while environmentally friendly has had significant shrinkage issues once units have been placed in the field. This agent requires very specific foaming processes to be developed to ensure proper stability of the foam over time. Our initial findings are that we would require additional investments for flow meters on each line.

Cure time of foam also affect changes in production time—for example, a 1/2 inch increase in volume will increase the set up time for the foam to cure in the fixture. Manufacturers will have to change their production methods, timing measures, along with allowing additional floor space for the fixtures to be held during the set time.

Traulsen believes that there are many design issues to be solved before it can make a rational choice in foam blowing agents. We also are using the same engineering resources to develop the transition plan for an environmentally sound choice in new refrigerant blowing agents.

Therefore, we would recommend a date no sooner that January 1, 2023 for all proposed foam products regardless of HFC GWP.

CONCLUSION

Traulsen continues to invest in its Green product line based as demonstrated by a number of factors as outlined in our comments. We are willing and have proven that we can make the tough decisions to change and have eliminated products that would be impractical and slow our organization in its progress and philosophy of being good stewards of global resources.

However, our analysis shows that adopting too aggressive of a timeline and implementing un familiar options industry-wide will bring about a number of unintended consequences that include:

- System complexity and design know-how causing a surge in demand for technology that has not yet been designed (refrigeration engineering) leading to a dramatic and sudden reductions in the variety of product applications offered in the marketplace.
- Reduction in the focus on product innovation.
- Job losses in an already fragile economy.
- Unknown employee risks-safety/occupational/health risks (variances in local rules) and unknown infrastructure changes to manufacturing sites.
- A lag in the availability of approved components and refrigeration substitutes in the supply chain.
- Unavailable compliance laboratory resources for short timeframe.
- Shortage of trained/certified service technicians with unknown local regulations for venting/recapture of HC's.

The equipment covered under the **stand-alone commercial refrigeration category** has far less impact in its contribution to overall GHG emissions. An allowance for our industry to continue our work in the consideration of the new blends that are potentially set for release can help reach the same desired outcome. Therefore, Traulsen respectfully proposes that we balance the objectives by adopting the following:

1. Set the threshold of its lowest GWP tolerance by end use application and hold for a period of no less than 10 years so that manufacturers can decide where and how to dedicate redesign resources.

2. Set a date of 2025 for stand-alone commercial refrigeration products.

3. Set a date of 2025 for removal of HFC refrigerants used in blown foams.

4. for large stand-alone units over 5,000btu's or requiring 2 or more systems to meet the 150 gram per system limit establish a narrow use exemption in order to continue using current refrigerants—especially R134a, R404a and R507A—for at least five years beyond the final rule date in order to allow for of a commercially available nonflammable option or for the market to supply components that would eliminate the need for two or more sealed systems.

Should you have any questions about statements made in this document, we will be happy to follow up with additional confidential data in the matter.

Sincerely
Mary Dane

Agency Approval Engineer
Traulsen-ITW Food Equipment Group
4401 Blue Mound Rd.
Fort Worth, TX 76106