TO: NSF 487 Joint Committee
FR: John Katz, Chair, Manufacturing Chemicals Task Group

RE: Decision Requested on F-GHG Criterion

I am writing this memo on behalf of the Manufacturing Chemicals Task Group, which I have chaired since October 2019. The Task Group (TG) has worked diligently to meet its charge to harmonize and update the criteria related to fluorinated greenhouse gases (FGHG) used in the manufacturing of displays and integrated circuits. However, we have not been able to reach consensus on a draft criterion, and so are seeking a decision and guidance from the Joint Committee on the future direction of this criterion. We present two decisions for the JC to consider:

- Decide whether the FGHG criteria should be in scope for this round of corporate common criteria.
- If the JC decides these criteria are in scope, provide direction on a preferred approach for including FGHG in the current common criteria standard, preferably preserving the rigor of some of the existing product-specific standards. The TG will use this direction to develop a criterion for the JC’s consideration.

Background and work to date

The existing criteria (summary attached) represent different approaches to addressing FGHG emission that were negotiated in their respective workgroups. All were optional.

- NSF 426 Server standard includes only corporate-level requirements for semiconductor manufacturers, rewarding companies that require their suppliers to a) conduct an inventory of their FGHG use and b) set an emissions reduction goal. No requirements are included for flat panel display manufacturers.
- The UL 110 Mobile Phone Standard requires suppliers of flat panel displays to demonstrate 90% reduction in FGHG emissions for facilities in scope, but sets no corporate-level program or management requirements. No requirements are included for semiconductor manufacturers.
- IEEE 1680.1 PC/Display standard adopted 2 criteria, one for flat-panel displays and one for semiconductors.
  - Display criterion requires a 90% reduction in covered emissions
  - Semiconductor criterion provides credit for conducting and reporting an FGHG inventory, and additional credit for achieving 70-75% reduction in emissions.

So the existing criteria represent a hybrid of both corporate level programs or practices and specific technical requirements for products or components. The group considered 3 approaches to harmonize the criteria, each of which had pros and cons associated with them, which are summarized in the table below. Significant work was done to draft criteria for options 2 and 3 and both were reviewed and discussed by the TG.
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<tr>
<th>Option</th>
<th>Description</th>
<th>Pros</th>
<th>Cons</th>
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| 1. Corporate level only (based on NSF 486) | Manufacturer requires suppliers that use FGHG to conduct an inventory of FGHG use and set a goal for reducing FGHG emissions | - Applies across all product categories  
- Rewards corporate action on FGHG reduction by suppliers  
- No copyright issues | - Limited in scope – only focuses on inventory and goal setting, not performance.  
- Doesn’t require meaningful reductions currently in some standards  
- Could supplant specific reduction targets in current standards |
| 2. Corporate level + incorporate other standards by reference | All aspects of #1, but also allows specific product categories meet the requirements of product-specific standards by reference (i.e. text isn’t included, just reference) | - All the benefits of #1  
- Retains reduction targets in each current standard, if applicable | - Relies on ongoing existence of product-specific criteria  
- Updates of specific targets would be out of NSF 487 control  
- Doesn’t update technical glitches in current criteria  
- Unclear how common criteria would interact with similar parts of product criteria |
| 3. Integrate (and update) product-specific requirements | Integrate the corporate and product level requirements of all the current criteria into a single new criterion, rewarding both corporate practices and product-level emissions reductions. Also update some technical aspects of the product-specific criteria based on experience implementing those. Structured similarly to IEEE 1680.1 for semiconductors. | - Applies to all current product categories  
- Includes requirements in current criteria  
- Updates parts of current criteria and brings them into one place for future updating | - Substantive changes in requirements require more discussion, negotiation  
- Not clear how some of the technical requirements apply to current products (e.g. not all displays are the same across product categories)  
- Do not have adequate data to set appropriate reduction targets for some products (e.g. small displays on printers?)  
- Potential copyright issue as much of the language is drawn from IEEE 1680.1 |
Findings of the Task Group

The Task Group strongly agreed that FGHG reduction is an important environmental aspect that should be addressed by environmental leadership standards like those feeding into NSF 487. However, the group was not able to come to consensus on an approach to crafting a criterion. We took a straw poll to gauge support for the approaches described above, followed by a deep discussion of the poll results and options for moving forward.

Straw Poll results:

- A strong majority of the group felt that it was not appropriate to include the FGHG criteria in the current corporate common criteria standard at this time. The main concerns expressed about including any criterion included:
  - It would be difficult to construct a criterion that set technically-appropriate reduction percentages for all the possible products that might reference this standard. To craft such a criterion we would need to get more information on the components used in the products covered by NSF 487, and their associated FGHG emissions and control potential.
  - It is risky to draft a strictly corporate level criterion similar to the language in NSF 426. Depending on how the common criteria standard is implemented, such a criterion might supplant the more rigorous emission reduction targets used in IEEE 1680.1 and UL 110.
  - It will be nearly impossible to both harmonize requirements for FGHG emissions across the product categories while at the same time not make significant substantive changes for any one product category since the existing criteria are so disparate.
- Approximately half of the group supported the idea of just including the corporate aspects of the criteria (Option 1). But the group as a whole was uncomfortable putting such a criterion forward given the uncertainty about how it might affect the reduction targets in the existing criteria (see bullet 2 above)
- The other two approaches – Options 2 and 3 – got very few votes of support, and the majority of the group would not support those going forward.

Options for the Joint Committee

Given the outcome of our straw poll and subsequent discussions, we decided to ask the Joint Committee to reconsider whether and how these criteria are integrated into NSF 487. The two options for consideration include:

- Decide whether the FGHG criteria should be in scope for this round of corporate common criteria.
- If the JC decides these criteria are in scope, provide direction on a preferred approach for including FGHG in the current common criteria standard, preferably preserving the rigor of some of the existing product-specific standards. The TG will use this direction to develop a criterion for the JC’s consideration.