February 17, 2004

Nigel Howard
Vice President
US Green Building Council
1015 18th Street NW
Suite 805
Washington DC 20036

By email tsac@committees.usgbc.org

Dear Mr. Howard,

The Vinyl Institute (VI) submits these comments as a supplement to our January 1, 2004 comments on the draft approach and proposed methodology the U.S. Green Building Council (USGBC) Technical and Scientific Advisory Committee (TSAC) has proposed for its technical assessment of specific vinyl (or PVC) and competing building and construction products.[1] This supplement is in response to the expanded explanation of the approach titled LEED TSAC PVC Task Group Review of Approach which was posted on USGBC's website on February 6, 2004.

This expanded explanation contains significant new information and changes the PVC Task Group's approach considerably from the approach released for public comment on November 18, 2003. The November 18, 2003 description of the approach contained a discussion of a lifecycle analysis framework. Two additional components of the review including risk assessment and a "precautionary approach" have been added. The emphasis now placed on the "precautionary approach" dilutes the Task Group's objectivity, and weakens the scientific credibility of its end result. In addition, the sensitivity analysis previously included in the approach of the PVC Task Group will not be conducted. All of these late changes raise questions about the criteria and standards that will be used to determine how other building

[1] The Vinyl Institute, Inc. (VI) is a U.S. trade association representing the leading manufacturers of vinyl, vinyl chloride monomer, vinyl additives and modifiers, and vinyl packaging materials. The VI's mission is to gather and communicate technical information to support the responsible manufacture, use and disposal of vinyl products, to build recognition among a wide range of stakeholders on the benefits and value of vinyl, and to maintain a level playing field with other materials. VI member companies include: CertainTeed Corporation, The Dow Chemical Company, Formosa Plastics Corporation, U.S.A., Georgia Gulf Corporation, OxyVinyls, LP, PolyOne Corporation, and Shintech, Inc.

materials are addressed within the LEED rating system. It is critical that if the USGBC is to award material credits (positive or negative) that USGBC be clear on their methodology.

This considerably changed approach was posted on USGBC's website 12 days before the February 18, 2004 stakeholder meeting leaving insufficient time for analysis and is inconsistent with the TSAC's process.

The recent release of the reference database is also impacted by the additional information provided on February 6, 2004 where for the first time the full list of products was available. There is not sufficient time to generate comments on more than 2000 studies and determine what information stakeholders might have on these newly identified competing products. Thus, we request that the deadline for comment on the reference database be extended from March 1, 2004 to April 1, 2004.

Although the PVC Task Group has a difficult task and is now being pressured to move quickly on vinyl, it is incumbent upon USGBC to be fair, consider current, peer reviewed studies and most importantly apply the same standards to all building materials.

Given the abstract nature of the review process, it may be useful for the PVC Task Group to take the opportunity to see a PVC manufacturing facility for itself. If that is of interest, the Vinyl Institute could certainly arrange a plant tour.

Attached are detailed comments on the new LEED TSAC PVC Task Group Review of Approach document.

We assume that offering the opportunity to comment on this process means that USGBC is open to changing it. To that end, the Vinyl Institute suggests the overall process for the work of the PVC Task Group be clearly defined in a narrative document, including:

1) The rights and responsibilities of all parties

2) The technical justifications and parameters surrounding the use of the "precautionary approach"—especially case studies in which it has been previously used by USGBC.

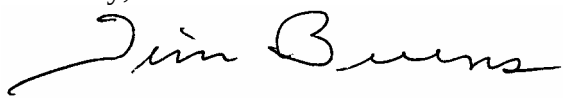
3) The process for creating the document database, for assuring its completeness and relevance, and for guaranteeing transparency of its review.

4) The final work product of the PVC Task Group

This clear complete narrative document should be developed and distributed for comment prior to this PVC review continuing.

We appreciate this opportunity to comment and are available to discuss any issues raised by them and respond to any questions you may have. In the meantime, please do not hesitate to ask for any additional information or if we can be of assistance in any way.

Sincerely,



Tim Burns
President and CEO

attachment

Additional VI Comments on
LEED TSAC PVC Task Group Review of Approach

Precautionary Approach and Lack of Objective and Unbiased Criteria

The Vinyl Institute is concerned by the new emphasis on a "precautionary approach" to the PVC Task Group proposed methodology. Our concerns are magnified by the lack of information regarding the technical and scientific criteria and standards which will be used to incorporate "precaution" into this review. As the process progresses, it is becoming less clear, and more subjective.

Based on earlier descriptions[2] of the process, VI concluded that USGBC would be examining existing lifecycle analysis concerning vinyl products as compared to competing materials. VI assumes the same approach will be applied to all building products. VI supports a lifecycle approach.

These late additions to the process before the meeting to comment on the process leave us confused about the approach and scope of the PVC Task Group, TSAC, and the LEED Steering Committee, respectively.

Additional Precautionary Considerations are Redundant

The PVC Task Group has discussed its version of the precautionary approach as an attempt to explicitly identify uncertainties in the database. Clearly identifying specific uncertainties makes sense. However, precaution is already embedded in other parts of the analysis. Slide 18 of the new approach document shows "Life Cycle Cells" with three estimates of potential impact--low, likely and high. These three approximate classifications take into account uncertainty in the impact estimate. In addition TRACI may include built-in elements of precaution since the estimates of cancer and noncancer risk in TRACI are based upon US EPA risk assessments that according to EPA use "public health conservative" defaults to address uncertainties in the scientific database.[3]

Moreover, the Vinyl Institute respectfully suggests that imposition of an arbitrary dose of "precaution" *actually increases the uncertainty* unless the criteria for what constitutes "uncertainty" – and how "precaution" is used to alleviate that uncertainty – are explicitly documented.

Similarly the Task Group indicates that risk assessments will be added to the lifecycle framework for direct exposure human health impacts. Cancer risk assessments make cautious assumptions to add precaution and account for uncertainty as a matter of course. Cancer risk assessments are used to ensure health protective, or cautious, estimates of potential risk of low-

[2] USGBC PVC Task Group Request for comment on approach and methodology November 18, 2003 and LEED PVC Database Introduction December 9, 2003.

[3] US Environmental Protection Agency, Proposed Guidelines for Carcinogen Risk Assessment, ORD April 1996 page 19

level environmental exposures from high dose animal studies or relatively high dose occupational exposures. Precautionary assumptions and defaults are generally used to account for uncertainty and develop an upper bound estimate of potential risks. For a complete discussion of these default assumptions see US Environmental Protection Agency, Proposed Guidelines for Carcinogen Risk Assessment, ORD April 1996. Two examples of defaults that lead to conservative health protective outcomes in risk assessments are:

1. Cancer risk assessments generally start from the lower 95% confidence limit on a dose associated with an estimated 10% increased tumor or relevant nontumor response (LED_{10}) as the point of departure from the observed high dose data and draw a line to zero dose and zero effect. The lower 95% confidence limit is used rather than a central estimate according to EPA to "accounts for uncertainty in the experimental data."[4]
2. This straight line from observed data to zero dose, zero risk is a linear default. According to EPA "the linear default is thought to generally produce an upper bound on potential risk at low doses."[5]

This discussion of cautious default assumptions illustrates that there are many precautionary elements already embedded in cancer risk assessment.

In noncancer risk assessments such as reproductive risk assessments scientists traditionally divide doses that have an adverse effect by precautionary uncertainty factors to arrive at an estimate of a reference dose, which is "an estimate of a daily exposure to the human population that is assumed to be without appreciable risk of deleterious reproductive effects over a lifetime of exposure."[6] US EPA's Guidelines for Reproductive Toxicity Assessment describe methods for determining a reference dose and describes the use of uncertainty factors.

> *Uncertainty factors for reproductive and other forms of systemic toxicity applied to the No Observed Adverse Effect Level (NOAEL) or benchmark dose generally include factors of 3 or 10 each for interspecies variation and for intraspecies variation. Additional factors may be applied to account for other uncertainties that may exist in the database. In circumstances where only a Low Observed Adverse Effect Level (LOAEL) is available, the use of an additional uncertainty factor of up to 10 may be required, depending on the sensitivity of the endpoints evaluated, adequacy of dose levels tested, or general confidence in the LOAEL. Other areas of uncertainty may be identified and modifying factors used depending on the characterization of the database (e.g., if the only data available are from a one-generation reproductive effects study; see Section III.G.), data on pharmacokinetics, or other considerations that may alter the level of confidence in the data.*[7]

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[4] US Environmental Protection Agency, Proposed Guidelines for Carcinogen Risk Assessment, ORD April 1996

[5] US Environmental Protection Agency, Proposed Guidelines for Carcinogen Risk Assessment, ORD April 1996 page 31

[6] US Environmental Protection Agency, Guidelines for Reproductive Risk Assessment, ORD September 1996

[7] US Environmental Protection Agency, Guidelines for Reproductive Risk Assessment, ORD September 1996, page 105

Often these uncertainty factors result in 1000-fold differences between the doses with observed adverse effects and the reference dose.

Inconsistency in Uses of Precaution
If a precautionary approach is to be used, it should not be used negatively against a product that has endured greater scrutiny versus an alternative that may have been studied to a lesser degree.

For example, some have often argued for the use of the precautionary approach with respect to emissions of dioxin associated with vinyl. The truth is that there are fewer uncertainties associated with vinyl's dioxin emissions than there are with competing products. In its Dioxin Inventory, US EPA has characterized the quality of the data on dioxin emissions from vinyl manufacturing facilities to be much higher than the quality of data for many other sectors including those representing alternative building products.[8] Many industries have not even characterized the emissions of dioxin from their processes.

A consistent application of the precautionary approach in this case would apply large precaution to products competing with vinyl if EPA's evaluation of their dioxin impact was of lower quality than vinyl's or not even present in EPA's identified dioxin sources. Absence of evidence is not evidence of absence. All materials should be evaluated for potential to generate dioxin throughout their lifecycle.

Lifecycle Analysis Framework—Failure to Weight Various Impacts
The latest Approach Document specifies that the Task Group will "stop short of the very value based step of weighting." Someone, at some point, will be assigning weighting factors or they will not be able to make a decision in this PVC review. Unless weighting factors are described explicitly, they all become the default weighting factor, which is 1.

The inevitable choice of weighting factors—defaults or otherwise—should be utterly transparent. Additionally, to be fair and science-based, the rating system cannot have one set of explicit or implicit weights for the vinyl review and another set for other products. Thus, USGBC must determine what weights are to be assigned to various impacts before any product is reviewed or risk the perception that the analysis is tailored to fit someone's subjective view of the product. It would also be appropriate to request stakeholder input on this aspect once defined.

Literature Review Database
USGBC should identify who has reviewed each study in the database and make these reviews available to stakeholders for peer review and stakeholder comment. Stakeholder comments on particular studies and reviews should also be available in the database. Similarly, the committee's assessment of the value of each study's information should be available to stakeholders to aid transparency of this process.

Life Cycle Cells
The VI will comment on the life cycle cells and impact estimates once that information is made available.

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[8] US Environmental Protection Agency, report Sources of Dioxin-Like Compounds in the United States 2000

IA2: Worker Chemical Exposures and Precaution

In the discussion over worker chemical exposures the task group appears to make an assumption that chronic risk is nonzero. Chemical exposures may be below a threshold for effects, which can be determined by the biological pathway. Assuming that all exposures cause harm, whether that harm can be discerned or not, is yet another example of embedding precaution within the existing framework.

The text states: "To evaluate potential risk from worker exposures to chemicals, we conduct worst-case assessments within the bounds of regulated exposure levels." This is an example of prejudicial precaution. In addition it is inappropriate to use only "worst case" assessments of chemical exposures in analyzing worker safety when they will be aggregated or compared with actuarial accident results. To do so would bias the results by heavily weighting uncertain chemical risks versus known accident risks. Chemical risks must be evaluated using low, likely and high estimates of exposure to account for uncertainty and avoid biasing the results. The lifecycle cells illustrated for the matrix suggest this approach. In addition, the task force can utilize significant government data for injury and illness rates by sector and numerous government standards designed to protect the health and safety of workers and the general public.

IA 4: Example: End of Life Risks: Fires

Fire and its impact are difficult to predict but is obviously of extreme importance for human safety. Certain well-respected scientific organizations, including the Center for Fire Research at the National Institute of Standards and Technology (NIST) and the National Fire Protection Association are good sources of information. NIST developed complex software to model growth and spread of both fire and fire gases, taking into account all materials including vinyl.

In fires, carbon monoxide and heat are lethal. Carbon monoxide levels and heat are a function of flame spread and energy released by combustion. These variables need to be included in addition to the probability of a fire. Combustibility and inherent resistance to combustion should also be considered: vinyl, and particularly rigid vinyl, stops burning when a flame is removed. Early detection and suppression are fundamentals of fire safety. Low-cost chlorinated PVC (CPVC) pipe for sprinkler systems helps mitigate flame spread.

Building materials are selected to meet the fire performance requirements of local building codes and authoritative codes and standards setting organizations like National Fire Protection Association (NFPA). In fact, NFPA's 300 safety codes and standards guide design and construction of installations in the US, as well as many other countries. The overall fire performance of a building product in a fire is based not only on the fire properties of the material, such as flammability, ignition temperature, contribution to heat load, flame spread, but to its intended use, expected mass amount, and location in the building, such as with pipes which are behind fire resistant wall. Having USGBC select products that comply and meet existing building codes and standards would appear to address the issues related to fire.

Due Process and Consensus Standards

In closing, the reasons for our insistence on the USGBC obtaining American National Standards Institute (ANSI) recognition and certification as an "Accredited Organization" should be amply clear. The shortcomings we have identified with the USGBC's proposed methodology for reviewing PVC building products under LEED, including:

- the TSAC's proposed application of the precautionary principle at the document review phase;
- insufficient or absent documentation of both the TSAC and steering committee review methodologies and processes; and
- the last minute revisions to the TSAC methodology;

explain why due process and a reliable technical or scientific approach are indispensable elements of credible standards-setting. As the VI and other industry associations have repeatedly stated, USGBC adoption of the ANSI due process requirements of openness, lack of dominance, balance, written procedures and appeals would provide the USGBC, LEED users and their ultimate customers with the certainty that LEED standards are free of many perceived biases and the most reliable green building standards that could be developed.