Consolidation of Comments from AIA/Vermont Roundtable on Building Energy Alternatives

Comments from participants on the major barriers to energy efficiency/renewable energy in design can be organized into the following topic areas:

- Designers & the Design Process
- Project and Design Costs
- Customer (e.g., Developers, Owners, Public Entities) Demands
- Construction Process and Costs
- Public Information/Education
- Policies

Designers & the Design Process

The primary barriers identified in this category were:

1. **Lack of technical training**. The majority of building design professionals have little experience in designing green buildings, and there is a general unwillingness to admit that they are not technologically up to date enough to make the most energy effective decisions. Recommendation to implement a program where paid, trained personnel visit architectural and engineering offices on a frequent basis to provide concepts and assistance on site, as well as by telephone and email.

2. **Additional work required, costing both time and energy.** Putting a building together with energy conservation in mind requires more discipline than money, and proper detailing and specifying low energy or recycled materials often rely more on research. It takes more time, planning, and coordinated effort to integrate good efficiency and renewable elements into a project.

3. **Reliance on standard cost estimating procedures.** In early stages of a project, cost estimates are usually based on typical square foot data to produce budgets. These costs frequently do not include the higher costs of energy efficient systems and practices. Currently, the incentive structure currently goes to technology, not design (i.e., building envelope).

4. **Institutional pressures to use "tried & true" technologies.** A&E firms design around conventional heating and cooling systems because they know they work and what they cost to install and maintain. The use of new technologies can expose firms to liability problems, and can also be difficult to Bond or Insure. A&E firms also know that these systems can meet the appropriate energy codes.

5. **Perceived "dullness" of efficient technologies.** There is a fear that services will not be bought without "flash" or signature design elements, and that efficient technologies impede desired design.

6. **Concern in quantifying energy costs.** Modeling building energy performance is uncertain, and there is a perception that energy costs are not a large enough percentage of the total operating costs to be of interest to clients.

7. **Concern in pushing client "comfort level."** There is a fear of not providing a perfect building climate 100% of the time, and of asking a client to risk occupant discomfort in favor of lower energy costs.

Project & Design Costs

The primary barriers identified in this category were:

1. **Low incremental life-cycle versus first costs**. Some owners cannot afford the higher first cost of energy efficiency measures, and low energy costs do not necessarily enhance the attractiveness of a life-cycle cost approach. Customers often require measure paybacks of 36 months or less.

2. **The "value" of value engineering**. Value engineering (as an institutional part of the design process) frequently trims projects aimed at lowering life-cycle costs.

3. **Focus on first-cost rather than life-cycle cost building comparisons**. Among some health care clients that are advised to consider life-cycle cost effectiveness, many times the facility investments are measured against energy wasteful buildings during their certificate of need review and found to be "out of line" and too financially burdensome for an "entitlement funded" facility.

4. **Desire to minimize design budgets**. In order to be successful in obtaining the assignment and in making a profit on the job, the number of design hours is frequently limited by using systems and techniques that are tried and true. Design budgets simply do not have the leeway to explore alternate systems.

5. **Shift in costs from energy to operation & maintenance**. Many times "cost effective" energy efficient designs simply shift costs from fuel purchases to the need for increased maintenance and service contracts for cleaning and calibration of high tech equipment. Contractors can also add to construction costs for non-standard technologies.

Customer (e.g., Developers, Owners, Public Entities) Demands

The primary barriers identified in this category were:

1. **Competitive bidding process.** The competitive bid process drives solutions back to time-tested systems and methods. Customers will frequently not incorporate efficiency measures into a competitive bid process.

2. **Builder versus decision-maker versus bill-payer.** The building developer and building occupant/user are frequently not the same entity. Non-resident owners transfer risk by ignoring energy efficiency measures since it is their tenants that pay the long-term cost of operation. In public projects, there may yet be additional decision-makers (e.g., voters).

3. **Clients do not request energy efficiency measures.**

4. **Procurement policies require selection of the lowest bid.**

5. **Customers are risk-averse**. They believe that the building should be like the last one – it worked.

Construction Process & Costs

The primary barriers identified in this category were:

1. **Fear of construction cost overruns with innovative technologies**.

2. **Contractor unwillingness to install efficient technologies**. Contractors are able to bid projects to build them the same way as last time, even if the drawings are different. Reasons for doing so include persuading the owner to build cheaply to maximize contractor profit, or to not ask questions about

details with which the contractor is not familiar to save time and money. Contractors know that they can make more money with standard construction details.

3. **Lack of contractor participation can nullify projected energy savings**. Even the most energy efficient design will work only as well as it is constructed and operated. The engineer has little control over both, and cannot guarantee an energy system performance in the contractor does not install the equipment as specified.

Public Information/Education

The primary barriers identified in this category were:

1. **Lack of publicized success stories**. There is a lack of well-publicized examples of successful, innovative energy-efficient and renewably powered buildings. Such buildings should be highlighted with professional tours including technical information, as well as more general efficiency awareness raising media for the public.

2. **Damage from unmet expectations**. The indoor air quality problems with early insulation efforts still have an echo impact on the public's perception of energy efficiency. Additionally, energy efficiency zealots may publicly overstate energy savings and recommend measures that are not cost-effective, souring customer experiences.

3. **Requirements for redundant/backup systems**. Until such time as high technology and innovative systems become commonplace, there will be a perceived need to have redundant systems to backup innovative systems that may experience premature failure (or performance problems).

Policies

The primary barriers identified in this category were:

1. **No clear, concise energy code**.

2. **Procurement policy requirements for the lowest bid**.

3. **Bonding looks at project costs and does not consider life-cycle costs**.

4. **Lack of tax incentives**. Our taxation system does not stimulate long-term investment in capital-intensive projects.

5. **Lack of funding resources**. Financial institutions may not agree to lend money to a project having an "alternate energy source" as the primary energy systems such as solar for space and water heating. Additionally, public institutions could more readily make use of subsidized, 0 percent loans.

6. **Design professional practice**. State policy does not require building drawings to be stamped by a building design professional to ensure that plans and final installation meet state and local energy and building code requirements. Energy efficiency questions are also absent from licensing exams.

7. **Rate tariff disincentives**. Distributed generation can experience rate tariffs that penalizing the installation of the system to the point that it becomes non cost-effective.