



**Comments of Susy Jones, High Performance Buildings
For Northeast Energy Efficiency Partnerships
To the National Institute of Building Sciences
Regarding the Representative Hearing on:
Data Needs to Achieve High Performance Buildings**

August 2, 2011

On behalf of Northeast Energy Efficiency Partnerships (NEEP), thank you for the opportunity to provide comments on the Data Needs to Achieve High Performance Buildings.

NEEP is a regional non-profit organization founded in 1996 whose mission is to promote the efficient use of energy in homes, buildings, and industry throughout the Northeast and Mid-Atlantic through regionally coordinated programs and policies that increase the use of energy efficient products, services and practices, and help achieve a cleaner environment and a more reliable and affordable energy system.

NEEP established the Northeast High Performance Schools Exchange ten years ago to lead the region towards high performance, or “green” design and construction principles in new and renovated schools, and to provide excellent learning and teaching environments that are energy efficient, cost-effective and utilize sustainable technologies. The Exchange developed the [Northeast Collaborative for High Performance Schools](#) (NE-CHPS), a set of building and design standards for schools, based on California's pioneering [CHPS](#) protocol. In 2009, the Exchange also released its NE-CHPS Guide for Operations and Maintenance, to provide a pathway for existing schools to become high performance. Today, more than 50 high performance schools have been constructed in the Northeast.

NEEP has broadened this regional project to provide policy and program guidance into high performance buildings across the public building sector. The work we do today concerning high performance buildings will pave the way for the eventual development of Net Zero Energy Buildings on a broader scale throughout the region.

Energy and high performance data in the Northeast

Recent news that the 2007 Commercial Buildings Energy Consumption Survey (CBECS) will not be released and that the 2011 edition is suspended due to lack of funding has raised some concern in the Northeast that viable tools continue to be available to meet the needs of the high performance building community. Schools and public buildings across the region have relied heavily on the accuracy and relevancy of EPA's Portfolio Manager, which uses CBECS data in its calculations, in order to benchmark their buildings and gain recognition through the ENERGY STAR label. The widespread use of Portfolio Manager illustrates the need for this tool to maintain its relevancy and accuracy.

Additionally, these comments expand upon the diverse range of data needs associated with high performance buildings and provide information about other resources and tools currently in use in the region.

For these comments, NEEP surveyed its High Performance Schools, Public buildings and Energy Codes leadership groups to gather feedback on:

- How the Northeast uses EPA's Portfolio Manager, in order to highlight the importance of maintaining the credibility of the ENERGY STAR program as it relates to benchmarking and building recognition.
- Other high performance data collection methods that states and communities are using, i.e.
 - Statewide benchmarking and energy data collection initiatives in [Massachusetts](#) and [New Hampshire](#)
 - A post occupancy study of high performance schools in Massachusetts conducted in 2009
- Additional tools and resources that states and communities are using to collect data on high performance building elements
- The barriers and challenges associated with data collection and assessment

How the Northeast uses EPA's Portfolio Manager

Measuring the performance of existing buildings using Portfolio Manager

As communities in the Northeast develop strategic energy plans and make improvements to their municipal buildings, many utilize Portfolio Manager software to measure their performance and gain recognition through the ENERGY STAR label. Local governments also utilize this data for internal planning purposes as well as to convey the value of energy efficiency to taxpayers.

States and communities that received federal Energy Efficiency and Conservation Block Grants are expected to have accurate, transparent, and compelling energy data that reflects the improvements made to buildings with taxpayer dollars. The State of Pennsylvania, for example, has required all local governments that received block grants to use EPA's Portfolio Manager to track their facility energy usage. Cities such as Cranston, Rhode Island and Springfield, Massachusetts have invested millions of dollars to improve the efficiency of their aging infrastructure - upgrading old boilers and lighting, installing solar hot water heaters and energy managements systems, and implementing other energy efficiency strategies – and are currently utilizing Portfolio Manager software to measure their progress. After several years of intensive work, the City of Cranston, RI now has 12 ENERGY STAR labeled buildings.

Utilities and Program Administrators utilize Portfolio Manager for customers in a variety of sectors

Utility providers in the Northeast such as National Grid and NSTAR and program administrators such as Efficiency Vermont utilize Portfolio Manager and related data in a variety of applications. For example:

- [NSTAR](#) provides an online tool for business customers who use over 300 kW that integrates with Portfolio Manager, allowing customers to track their utility bills and benchmark their buildings
- National Grid partners with EPA for its [Whole Building Assessment Program](#), in which participants ranging from businesses to schools receive a benchmarking score generated by Portfolio Manager and suggested actions to improve that score.
- Efficiency Vermont encourages commercial real estate property managers to benchmark their buildings using Portfolio Manager. A representative who works on new construction programs

stressed the importance of using reliable energy data; if there is a question about the validity of the data, then this “makes [our] assumptions weaker” and threatens “the ability to use data in a promotional way.”

Other high performance data collection methods

Statewide benchmarking and data collection systems

Massachusetts and New Hampshire have developed statewide tools to help communities and school districts assess their energy usage. Both systems were developed using funds from the [Regional Greenhouse Gas Initiative](#) (RGGI). The Massachusetts system, called Mass Energy Insight, is available to all municipalities and helps communities track and assess energy use. The New Hampshire system is solely for school districts and is specifically a benchmarking tool. Both models illustrate the ability of states to lead the energy data collection efforts.

Massachusetts

Massachusetts offers a free web-based tool called [Mass Energy Insight](#) that allows cities and towns to monitor their municipal energy usage and costs. Municipalities can create an energy use baseline, compare energy usage across building types in order to identify prime candidates for improvements, and communicate this information to the public. The hope is that this tool will eventually enable cities and towns to benchmark their buildings against other municipal buildings in the state on a weather normalized basis. The distinguishing feature of this tool is that utility data (electricity and gas usage) is directly downloaded into the system, relieving cities and towns of the burden of entering this data themselves. There are currently 222 communities that have been trained on how to use Mass Energy Insight.

New Hampshire

All New Hampshire K-12 schools (both public and private) are eligible to participate in the [New Hampshire EnergySmart Schools](#) program, free of charge. Schools submit basic data, such as energy use, size of school, number of students, and number of computers. After submitting this data, schools receive an analysis of their energy consumption and utility costs. The report compares a school's data against similar schools in New Hampshire and across the country (by integrating with Portfolio Manager) to assess performance relative to other buildings. Thus far:

- 146 schools have participated, about one third of New Hampshire's schools
- 25 schools have qualified for the ENERGY STAR label

Massachusetts post occupancy study to measure the energy performance of 15 new high performance schools

Post occupancy studies are needed to determine the successes and flaws in emerging high performance or “green” building protocol. Establishing best practices for evaluating the energy performance of new buildings is a priority for the building community. A 2009 post occupancy study of Massachusetts high performance schools¹ reveals a variety of issues, both with data collection and the actual performance of schools - and highlights the need to continue to study new buildings, which do not always perform as designed:

¹ *Massachusetts Green Schools Post-Occupancy Study of Energy Efficiency*, on behalf of the Massachusetts Renewable Energy Trust (MRET) and the Massachusetts School Building Authority (MSBA), August 5, 2009.

The Massachusetts report studied the energy efficiency of 15 high performance² schools as compared to 15 standard schools built in the same time period. Some key findings included:

- The median high performance school saves 19% on fuel costs and spends 3% more on electricity over the median standard school. The reasons behind this finding are explained in further detail in the report and actually led to revisions to the next version of the MA-CHPS protocol (i.e. additional guidance on controlling plug loads).
- The study assessed the 15 green schools and 15 standard schools using Portfolio Manager and found that 4 of the green schools and 7 of the standard schools qualified for the ENERGY STAR label. The study reported that: “These findings have only limited utility as a rough indicator of performance because the Portfolio Manager Tool is not sophisticated enough to account for nuances in school operation or design.” The report found that energy modeling was a more effective tool.

Additional collection tools and resources being used by states and local governments include:

- [SchoolDude](#) - Many school districts in the Northeast utilize SchoolDude, or a similar program, to track utilities, as well as manage maintenance work orders, schedule preventive maintenance tasks and other facility-related tasks.
- [EPA’s Tools for Schools](#) - Schools across the region utilize Tools for Schools or other indoor health and safety program (an integral part of the CHPS protocol). This tool helps access and manage building maintenance, waste management, ventilation, and pest management.
 - New Hampshire passed a bill in 2010 requiring the department of education to implement the Tools for Schools program in public schools
- [CHPS Operations Report Card](#) - This tool is in use in California and is slated to be used in Rhode Island and other Northeast states in the near future. This tool benchmarks the current performance of existing schools, provides a report card of results and makes suggestions for improvement. Assessments take place in five categories: energy efficiency, thermal comfort, visual comfort, indoor air quality, and acoustics.
- [Facilities information management: A guide for state and local education agencies.](#) - This guide was published by National Center for Education Statistics in 2003 with input from Northeast stakeholders and includes guidance on identifying a basic set of school facilities data elements.

A note on indoor air quality

Making energy efficiency upgrades to buildings and in turn, collecting data on the energy performance of those buildings are cost-effective steps toward environmental sustainability. However as buildings become tighter, indoor air quality can be adversely effected due to reduced ventilation rates. Monitoring indoor air quality in buildings that have undergone extensive energy efficiency upgrades or have been built to high performance protocol is necessary, especially in K-12 schools where children’s developing systems are more susceptible to environmental toxins.

Barriers and challenges

- **Aligning State funding with building data:** State Departments of Education may be reluctant to invest in resources to gather energy and related data if state funding for school projects is not calculated on these factors. To invest in data collection, there would need to be a shift to a system that involves prioritization of construction projects based on some criteria that include the current condition of the existing building.

² These 15 schools were built during 2001-2006, as part of the Massachusetts Renewable Energy Trust’s Green Schools Initiative (GSI).

- **Training is essential and underfunded:** Facilities staff need further training to maintain buildings properly, operate energy management systems, and track and assess utility usage. A representative from a school district in Rhode Island notes that tracking utilities is not enough—there needs to be somebody on staff who is able to perform the analysis on the data and create a strategic plan to make improvements.
- **Energy use does not tell the whole story:** A representative from the New Hampshire Department of Education pointed out that schools that are old and in disrepair may consume less energy than new energy efficient schools, which can skew energy benchmarking data. Therefore, low energy use alone does not signify a healthy high performing building. Other indicators, such as maintenance cost per square feet are needed to give a fuller assessment.

Conclusion

The following points highlight some of the key issues related to data collection for schools and public buildings in the Northeast:

- Municipalities need data for internal strategic energy planning and to convey the value of energy efficiency investments to taxpayers.
- Utilities and program administrators utilize energy data as a way to assess building performance and build customer relations.
- States such as New Hampshire and Massachusetts have statewide data collection systems that may serve as models to other states. In particular Mass Energy Insight, developed for Massachusetts cities and towns, directly downloads energy use data from utilities.
- Post occupancy studies of high performance buildings are needed to determine the successes and flaws in emerging green building protocol.
- Indoor air quality should be monitored alongside energy performance, since energy efficiency upgrades can sometimes adversely affect indoor air quality
- State funding mechanisms, inadequate training, and a narrow focus on energy usage can be barriers to accurate, useful and successful data collection.

NEEP would like to thank the National Institute of Building Sciences for the opportunity to comment on the Data Needs to Achieve High Performance Buildings and look forward to staying involved in this important discussion.

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