

Sustainability Indicators Working Session

Summary by Meleah Houseknecht and Sarah Percy

Panelists

Gioia Thompson, *Environmental Coordinator, University of Vermont**

Sarah Hammond Creighton, *Director of Sustainability and Manager, Tufts Climate Initiative, Tufts University*

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Both Gioia Thompson and Sarah Creighton participate in the NECSC Sustainability Indicators Workgroup, which has been developing a set of indicators to compare energy and waste data for six institutions of higher learning. In addition, Thompson's recommendations are based upon her experience in producing *Tracking UVM*, a report on environmental indicators for the University of Vermont from 1990-2000. The workshop focused on:

1. the types of sustainability indicators that can be collected for educational institutions;
2. the value in collecting these indicators;
3. the advantages and disadvantages of normalizing data;
4. the most efficient methods for collecting and disseminating it to a wider community.

The primary purpose of the NECSC Sustainability Indicators Workgroup has been to explore what the universal difficulties are in collecting and analyzing the data necessary to track a campus's waste and energy consumption. The workgroup's initial analysis focused on comparing data from the years 1990, 2000, and 2004. The findings of the group were that the data collection process is time-intensive and often overwhelming. The appropriate contact for collecting data is often unclear and it is difficult to choose among the large variety of data types available from campus offices. Furthermore, there is the question of how and when to normalize data such that it can be compared between very different types of institutions. While normalizing on a per student (per capita) and a per square foot basis did produce some illustrative results, these types of comparisons often resulted in more questions

than answers about each campus's true sustainability. Despite the frustrations associated with this process, both speakers agreed that the tracking of particular indicators is essential for addressing the most important environmental impacts associated with campuses. The major categories of impacts identified by Thompson and Creighton are GHG emissions/energy use, solid waste and recycling, and water use. The remainder of this summary outlines recommendations related to the collection and use of campus sustainability indicators.

TYPES OF INDICATORS COLLECTED

The extent of collection and the types of indicators collected varies greatly from campus to campus. While some schools monitor their electricity use with real time monitors, others keep minimal records of where and when energy consumption takes place. Many of the metrics measured by environmental or sustainability offices at the schools present in the working session are shown in Box 1 below. There are also several metrics measured by other campus offices that could be useful in the development of sustainability indicators, shown in Box 2 below. The lists are not all-inclusive.

Box 1 Indicators Collected by Campus Sustainability Offices and Facilities Management

- Energy consumption
- GHG emissions
- Electricity use
- Recycling and solid waste generation rates (total lbs and percent recycled)
- Generation of food scraps from dining halls
- Paper use
- Storm water management
- Percent of power co-generated
- Total quantity of hazardous waste generated
- Amount or percentage of organic wastes composted
- Total campus water use / steam and chilled water use
- Passenger trips on campus shuttles / transit system use

Box 2 Indicators Collected by Non-Environmental Offices across Campus

- Diversity
- Full-time equivalent student and faculty counts
- Human relations information (e.g. turnover rates)
- Transit data
- Research dollars
- Institutional publications
- Investment/profit
- Water quality
- Amount of new construction and renovation
- Alumni data
- Legislative information
- Safety
- Purchasing
- Liability violations
- Attitudes on campus

The participants in the working session agreed that collection of sustainability data is tedious and time consuming. Given the high demands on the time and budget of campus sustainability offices, it was suggested that campuses start by measuring only those actions that have the greatest impact on the environment. In order of priority, these include activities that result in greenhouse gas (GHG) emissions/energy use, generation of solid waste and recycling, and water use.

UTILITY OF COLLECTING INDICATORS

While it may require great time and effort to collect campus sustainability indicators, the metrics do serve many purposes. Some of these uses, suggested by participants in the working session, are listed in the text box below. The collection of campus sustainability indicators is, first and foremost, essential to the process of decreasing the environmental impacts of a university's management decisions. The process also helps set up a system of environmental accountability. Sustainability indicators can also be extremely useful in helping to focus a sustainability office's limited time and money. To this end, Creighton suggested tracking every potential environmental project by the estimated cost, time involved, educational potential, and likely impact. Those projects which are expected to yield the greatest decrease in environmental impact for the least amount of time and money should be pursued.

Box 3 Uses for Sustainability Indicators

- Track trends and progress
- Inform management decisions
- Compete with rival schools
- Create student incentives
- Achieve compliance
- Fulfill LEED certification requirements
- Create a baseline and benchmark
- Pursue operational efficiency
- Support environmental policy and decisions
- Preserve institutional memory
- Educate

ADVANTAGES AND DISADVANTAGES OF NORMALIZING THE DATA

Because of the vast differences in size, mission, budget, and culture between institutions of higher learning, sustainability indicators must be normalized if meaningful comparisons are to be made. Such comparisons can provide insights into the differences in environmental impact caused by various uses of space and operational decisions. For example, the indicators collected by the NECSC Indicators Workgroup brought attention to the fact that more intensive uses of space led to greater energy efficiency. This in turn highlights the potential for improved scheduling and intensified space management to greatly enhance an institution's overall efficiency. Running multiple labs in the same room and scheduling classes for Fridays, early mornings, and evenings can reduce the pressure to build more classroom and lab space. However, it was noted that these types of changes would require not only a change in operations, but a culture shift as well.

As one workshop participant noted, another advantage to normalizing and comparing data between institutions is the power of intercampus rivalry. In addition to the leverage this generates with administrators, this rivalry is a particularly effective tool for getting the entire school community involved.

The NECSC Sustainability Indicators Workgroup used the following statistics to normalize their data:

- number of full time-equivalent (FTE) students
- number of gross square feet in campus buildings
- size of endowment

While there are advantages to normalizing data for the sake of comparison, there are disadvantages as well. Normalized data can mask meaningful differences in

overall resource consumption. For instance, two buildings may be equally energy efficient *per square foot*, but if one uses less space to accommodate the same use it will consume less energy overall. In addition, when an institution is growing, energy efficiency per square foot can improve, even while net emissions are increasing.

Normalization of data can also facilitate comparison between two non-comparable entities. For example, the *per student* energy consumption of a research university will tend to be large compared to a small college, not because of differences in energy performance among similar buildings, but because research labs tend to be more energy intensive than classrooms and because a greater proportion of the university population is made up of staff, rather than students. In addition, different institutions can measure the same data differently. The NECSC Sustainability Indicators Workgroup found that even within a single university there may be many ways to measure the number of FTE students; different schools disclose different information related to the size of the endowment; and even energy consumption can be calculated differently depending on how much power is generated on campus and for what purpose.

While these challenges do not negate the value of normalizing sustainability data, they do point us towards the need to be careful in the presentation of these numbers. First, it is crucial to be clear about what is and is not included in the calculations—to state assumptions. Ultimately, part of the goal is to create a common language and to increasingly standardize the data available and the systems used to calculate normalized sustainability indicators. For now, while normalized data can help point towards areas where the institution is weak compared to other institutions, it is most useful as an internal tool, and should only be used to compare similar institutions.

EFFICIENT METHODS FOR COLLECTING AND DISSEMINATING THE DATA TO A WIDER COMMUNITY

Given that gathering data takes up the valuable time of operations managers, sustainability coordinators and students, environmental offices must be careful not to gather more data than they have time to analyze or data for which there is not a clear use. The following are a few good rules of thumb for collecting data related to sustainability indicators:

1. Always know the purpose of data before investing time in measurement or collection.
2. Student projects often generate good data, but also require supervisory time, so projects should be screened carefully for those with maximum impact and requiring minimum supervision.
3. Given limited time and resources, it is important to focus on the areas that have the greatest environmental and economic impact. For example, it is often easier—and students are more eager—to collect information on kWh consumed by dorms than by research buildings, but research labs generally consume far more energy per square foot.

Thompson and Creighton suggested that sustainability coordinators tap into their school's Institutional Research Group, because this group of trained statisticians is already collecting much of the data relevant to campus sustainability and already has the skills needed to properly analyze this data. Creighton requested that Tufts' GHG emission data be included in the Institutional Research Factbook. As a result, the calculation of GHG emissions has been institutionalized beyond the sustainability office and the estimates produced are viewed as more credible and made more accessible to a wider audience. Ideally, when sustainability metrics are adopted by an institution's administration they become a public relations tool and are seen as adding value to the college or university overall, giving the sustainability coordinator further leverage. This was certainly Thompson's experience when she published UVM's 2002 sustainability report—the President saw it as an important enough PR piece to send it to the Trustees, and the Provost is now interested in making UVM “a leading Environmental University.”

FINAL RECOMMENDATIONS

Thompson and Creighton ended the session with a reminder that, while normalized data have their place, we should not lose sight of the importance of measuring and reporting net emissions, which ultimately determine our level of overall impact. Emissions reduction goals set by campuses should be related to net impacts and, where appropriate, should be made consistent with national and regional goals.

One of the key challenges for campus sustainability officers is balancing a focus on operational change and goals setting with the need to shift campus culture through student empowerment and education. Essential to this balance is maintaining a focus, even when working with students, on the changes which will have the greatest impact (which will not always correlate with the statistics having the biggest “wow factor”). One important way to do this is to emphasize, through the strategic use of specific metrics, the uses of resources (such as the global atmosphere) that matter most.

USEFUL TOOLS FOR COLLECTING SUSTAINABILITY METRICS

- Clean Air-Cool Planet's Carbon Calculator can be downloaded at: <http://www.cleanair-coolplanet.org/toolkit/content/view/43/124/>
- EPA's Energy Star program offers a benchmarking tool for buildings: http://www.energystar.gov/index.cfm?c=spp_res.pt_spps_automated_benchmarking
- The Campus Consortium of Environmental Excellence offers many resources, including a *College and University Sector Self-Tracking Tool* and several comprehensive reports. For the tool go to: <http://www.c2e2.org/cgi-admin/navigate.cgi>