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'Show Me the Green' through a Hosted Sustainability Solution for Higher Education

Karen Patch, SAS Institute Inc., Cary, NC

ABSTRACT

Over 650 college and university presidents have signed the American College and University President's Climate Commitment (ACUPCC), which pledges them to strive for carbon neutrality by 2050. With this commitment, transparency and communication of sustainability strategies is imperative. This transparency extends beyond the capacities of simple spreadsheets and manual reporting for the tracking of Greenhouse Gas (GHG) emissions and communication of institutional sustainability strategy. Institutional sustainability performance must be tracked across educational, research, curriculum, and administrative factors, which in turn require the vital steps of integrating and analyzing data. Through the insight achieved from data integration and advanced analytics, the ability to take decisive action is how educational stakeholders can make an immediate impact on this global imperative. With SAS® Higher Education Sustainability Management, higher education institutions can easily track, communicate, and educate on their sustainability strategies to their constituents.

INTRODUCTION

This paper provides an overview of what sustainability means to higher education institutions. Colleges and universities are poised to be community role models both in educating the students who will naturalize these concepts, and in manifesting the commitment to become carbon neutral by 2050.

With this climate commitment, these institutions must determine how to best track, measure and manage their sustainability efforts and provide transparent results to their constituents. Institutions are currently using bi-annual spreadsheet inventories to track high-level emissions, but are struggling to gather and report the data in a more meaningful and timely manner.

Reasons are given for the importance of using the SAS Higher Education Sustainability Management hosted solution to replace basic spreadsheet inventories that provide infrequent accounting of emissions with a more strategic, analytic, and timely management and reporting system of sustainability.

WHAT IS SUSTAINABILITY?

Sustainability is “ensuring that we are using resources today that will not jeopardise the resources of tomorrow” (Dr. *Hau L. Lee, Thoma Professor of Operations,Information, and Technology, Stanford University*). Sustainability is a broad term that encapsulates not just our ability to sustain life on our earth through becoming carbon neutral, it also means providing for the welfare of the world’s citizens. There are many prongs to the concept of sustainability, but in general, sustainability is about balance. Finding the balance that ensures our resource consumption does not exceed the regeneration of those resources, and that ensures our biological systems can absorb waste production. Sustainability as a whole represents a reconciliation of environmental, social, and economic demands. This theory is traditionally called the “three pillars” of sustainability.

Within higher education, the ACUPCC is the predominate source for sustainability. The ACUPCC defines climate neutrality “as having no net greenhouse gas (GHG) emissions, to be achieved by minimizing GHG emissions as much as possible, and using carbon offsets or other measures to mitigate the remaining

emissions." Another association dedicated to sustainability in higher education is the Association for the Advancement of Sustainability for Higher Education (AASHE). AASHE defines sustainability more holistically; "in an inclusive way, encompassing human and ecological health, social justice, secure livelihoods, and a better world for all generations."

WHY TRACK SUSTAINABILITY?

Higher education institutions have been given the imperative to be sustainable in order to continue the directive of education, research, and community service. In recognizing this imperative, colleges and universities have taken up the mantle of sustainability and charged forward with a commitment not yet seen in the corporate world.

They are committing to "Showing the Green" by signing the ACUPCC as well as implementing sustainable strategies to ensure all-encompassing administrative, academic, and research commitments.

In order to track this commitment, there must be a mechanism or methodology to determine metrics that convey sustainability performance. There are many other drivers that have further invoked the need to track sustainability in colleges and universities, such as the following:

- Finding cost savings through waste reduction, energy conservation, and accident prevention
- Strengthening of community relations
- Attracting students and educating our future leaders
- Enhancing students' employment prospects with employers who are also interested in pursuing sustainability
- Attracting government sources of funding for sustainable research and education
- Driving social change through development of new technologies
- Appealing to private donors who are also concerned about sustainability
- Increasing support of alumni and local communities
- Complying with regulations

CURRENT METHODS OF TRACKING SUSTAINABILITY

ACUPCC

For colleges and universities, there is currently no standard framework for tracking and reporting sustainability. Organizations such as the ACUPCC and AASHE are looking to provide the standard guidance and frameworks for institutions who want to track and report on their sustainability efforts. Those institutions that have signed the ACUPCC have been given specific steps to complete as part of their commitment to becoming sustainable. They must complete an emissions inventory, must set targets and milestones for climate neutrality, must define immediate steps to reduce GHG emissions, must integrate sustainability into their curriculum so that it is part of student's educational experience, and must make available to the public an action plan, inventory, and progress reports .

Most of the signatory institutions are using the Clean Air Cool Planet organization's spreadsheet called the Campus Carbon Calculator™. This is a tool for assessing campus GHG emissions and is a workbook of spreadsheets created in Microsoft Office Excel. The spreadsheet is fairly complicated for the average user and is typically completed by the institution's Office of Sustainability. This inventory is completed every two years and can be a laborious process for those involved. Results from the inventory cannot be reported through the tool and graphs must be copied from Microsoft Office Excel into another reporting format. Data Management is the number one challenge to this effort because the data is often difficult to

acquire and comes from a myriad of sources and systems such as facilities, transportation, and dining. This inventory is also a lagging indicator of emissions that are at an institution- wide level and not at the granular level that is needed for true sustainability management.

Institutions are also reporting sustainability efforts through their campus Climate Action Plan. This is a communication vehicle to define how campus leaders are making commitments to academic and operational programs that address climate change. The Climate Action Plan is a roadmap that spurs institutions into moving forward in sustainability management. This plan is typically a large document that is available in a format such as Portable Document Format (PDF). The Climate Action Plan includes climate actions goals, target dates for achieving those goals, actions to incorporate climate change into curriculum, actions to expand research around climate change, actions to reduce GHG emissions, and mechanisms for tracking progress on goals and actions.

AASHE Sustainability Tracking, Assessment, and Rating System (STARS)

STARS, developed by AASHE, is a voluntary, self-reporting framework. This system is designed to help institutions recognize and gauge relative progress toward sustainability. Those institutions who invest in the STARS program can be certified as bronze, silver, or gold, based on performance. The objective of STARS is to provide a framework for understanding sustainability in all sectors of higher education. As it uses a common set of metrics, the results will enable good comparisons across institutions over time. These comparisons will create incentives for continual improvement in sustainability, and this process will facilitate sharing of sustainability best practices in the higher education communities.

ENERGY MANAGEMENT SYSTEMS

Another more tactical tracking tool that is used by colleges and universities is centered strictly around energy management. Energy management systems have dashboards that provide indicators of energy usage and emissions in an almost real-time manner. Information is fed directly from the meters to a unit that captures the data and sends it to a database, which in turn feeds the dashboards. Those dashboards are used by facility managers to provide feedback on energy usage by building. These dashboards also help drive student behavior by showing energy usage in dorms. This is useful in student competitions for dorm energy management. Though the dashboards provide a tactical look into energy management, they do not provide a complete holistic view of sustainability across the institution.

CHALLENGES TO TRACKING SUSTAINABILITY

There are many challenges to tracking sustainability in colleges and universities. Quantifying the aspects of sustainability proves to be difficult for many. For GHGs, institutions typically look at emissions by scope. Scope 1 emissions focus on those emissions owned directly by the institution such as a chilled water plant on campus. Scope 2 emissions focus on those emissions purchased such as electricity. Scope 3 are those emissions that are indirect, such as travel and commuting. Some of these emission measures are easily obtainable through existing systems such as a facilities management system, but others are more difficult to calculate, such as commuting and air travel for Scope 3 emissions. Those responsible for obtaining this data are often reliant on various systems both internal to the campus, as well as those outside the campus, such as airlines and local transportation systems. Data Management is a huge obstacle to tracking sustainability performance. With data residing in those multiple systems within other institutional departments, on a spreadsheet on someone's individual PC, or buried deep in an e-mail, data gathering is quite a chore for the sustainability staff. Data often has to be manipulated, massaged, and calculated in a specific manner to meet established GHG protocols. To accurately track

sustainability from a holistic view of campus performance, a data management process must be established in order to ensure tracking is accurate and repeatable.

Sustainability reporting is another challenge for colleges and universities. Identifying stakeholders for reporting is the first challenge. There are many constituents with varying interests in sustainability. The Board of Trustees, faculty, students, department heads, community leaders, and the Office of Sustainability are just some of the stakeholders who want or need information about campus sustainability. Currently, sustainability information is disseminated to indentified constituents through a high-level mechanism such as the Climate Action Plan. The Campus Action Plan provides constituents with a yearly report of sustainability efforts and performance for the prior year.

THE SAS COMMITTMENT TO SUSTAINABILITY

SAS has long been committed to sustainability. Since 1976, sustainability has been a core value for SAS and drives our innovations. SAS was just recently ranked #1 on the FORTUNE "100 Best Companies to Work For" list , based on many of those core values. With our LEED buildings, solar farm, on-site day care, healthcare facility, dining facilities, composting, and employee-led recycling program , SAS is committed to sustainability company-wide. SAS also has developed products to help organizations track and report on their own sustainability initiatives. SAS® for Sustainability Management enables organizations to measure, manage, and report on the three pillars of sustainability – environmental, social, and economic indicators – and determine business strategies that reduce risk and increase shareholder value. For the 2008 reporting period, SAS' own sustainability team used SAS for Sustainability Management to provide the facts and figures regarding our environmental footprint. This software solution was used by SAS Corporate Services for environmental data management within offices owned by SAS globally. Social and economic information was provided from the operational systems that support our global human resources and financial departments.

SAS HIGHER EDUCATION SUSTAINABILITY MANAGEMENT SOLUTION

As we have learned, for higher education institutions, the complexities of tracking and reporting GHG emissions extend beyond the capacities of simple spreadsheets and manual reporting currently provided to them. Universities and colleges are finding that current Information Technology (IT), Institutional Research (IR), and free tools are not adequate for solving tomorrow's problems. Institutional performance now requires sustainability measures across educational, research, curriculum, and administrative factions, which in turn requires the vital steps of integrating and analyzing data. If tracked through current tools, the reporting tends to be in silos, lagging, and insufficient in providing the entire picture of sustainability needed to reflect overall performance. Through the insight achieved from data integration, advanced analytics, and timely reporting, educational stakeholders are able to take decisive action and make an immediate impact on this global imperative.

WHY A HOSTED SOLUTION?

The Education Practice at SAS, together with our university partners, are developing a hosted solution for sustainability management. This solution has evolved from the SAS® for Sustainability Management solution that is currently offered and is used globally by many of our customers. In working with our higher education customers, SAS has learned how important this imperative is to an institution's administrative and academic future. Higher education thought leaders are seen as some of the pre-eminent experts in the world of sustainability. Corporations recognize that the students of today are their future catalysts for climate change. In designing this hosted solution, SAS has worked closely with some

of those thought leaders to better understand the current campus environment of sustainability. SAS has customized the solution to provide current education-specific frameworks such as the AASHE STARS reporting system.

With the SAS Higher Education Sustainability Management hosted solution, institutions can:

- Measure institutional sustainability activities using education-oriented methodologies and protocols from AASHE and other university-specific strategies. Report ongoing performance to ensure transparency between institutional constituents and organizations such as the ACUPCC.
- Create an integrated, consistent source of quality information that can bind initiatives to a common sustainability framework which allows alignment across all areas of the institution from student engagement and education to institutional administration and local communities.
- Improve performance and reduce costs by identifying the metrics that have the greatest impact on goal attainment to help make the most informed strategic decisions.
- Apply the power of SAS analytics and modeling to analyze scenarios and run simulations to pinpoint the best sustainability strategies for your institutions.
- Prioritize institutional strategies and align funding for innovation, environmental program development, and faculty and students accordingly. Establish sustainability scorecards and strategy maps driven by the sustainability goals of the institution.
- Reduce institutional IT footprint by implementing a hosted solution.
- Utilize established reporting frameworks to provide constituents with more timely information that is currently required by AASHE or ACUPCC providing an up-to-date accounting of performance against goals and targets.

HOW IS SAS DIFFERENT?

How can this solution take higher education institutions above and beyond spreadsheets and climate action plans? How can institutions report and track their sustainability strategy? As the leader in business analytics, SAS is the critical enabler that allows institutions to meet their environmental and social objectives with a hosted solution that:

- Has GHG modeling capabilities that go beyond traditional carbon accounting. The solution allows you to model not only on a yearly basis, but also on a monthly basis. The models provide dimensionality, allowing you to break out emissions by dimensions such as building, square footage, department, fleet, and scope.
- Provides embedded data integration to process data received from the institution both through FTP files and through custom Web forms. Data management processes are established and become repeatable.
- Has pre-defined sustainability performance management frameworks, including one based on AASHE STARS. You can also incorporate institution-specific sustainability strategies.
- Is designed specifically for educational institutions and enables you to expand IT reach with minimal investment and significant Return on Investment (ROI).
- Provides a Web-based communication vehicle to communicate results to your constituents in an easy to use application.

HOW THE SOLUTION WORKS

Sustainability Reporting

The SAS Higher Education Sustainability Management solution is designed to help institutions manage sustainability from a holistic perspective. For Sustainability reporting, SAS looks at the various constituents who want or need to see the data and how those constituents should view or work with sustainability data. For the general information consumer who just needs to view performance and reporting at a high level, the solution provides a sustainability portal that is the central hub for all of the sustainability dashboards and reports. The portal is a zero-footprint conduit to viewing or accessing the sustainable metrics, strategies, reports, or applications. Users log into the portal and based on their login, see multiple pages of sustainability focused information that is specific to their role in the institution.

As SAS develops this solution with our university partners, three initial types of users are identified as follows:

- **Information Consumers** - can include the Board of Trustees, faculty, students, and other general consumers. These constituents typically want to see a high level of institutional performance for measures such as air quality, water quality, and natural resource management. These users might also be interested in performance of specific sustainability programs such as dormitory energy usage reduction as a result of a dormitory competition, or outcomes of recycling programs. These users typically want to see these metrics in a dynamic dashboard, an easy to read graph or in a list of reports.
- **Power Users** - can include Department Heads from areas such as facilities and transportation. If the institution wants to manage sustainability at a department or college level, the information these users will need is summarized by department, by building and by fleet. Their view needs to dig a little deeper as they are the decision makers who need to be able to act on the insight gleaned from the information. Power Users want their information in dashboards that drill down to multi-dimensional reports. These users also may want to manipulate those reports to provide a more customized view to fit their needs.
- **Analysts** - work in the office of sustainability, or are part of the institution's core sustainability team. Analysts will be managing aspects of the solution from the institution's side and will be responsible for sending the data to SAS via FTP files or Web data entry forms, or both. These users are familiar with the process of gathering and managing disparate data that is needed to populate the solution. The SAS team will work closely with these users during the solution setup and maintenance phases. Analysts will also working with the emissions (GHG) modeling component and be working with "what-if" scenarios within the solution.

SUSTAINABILITY PORTAL

Figure 1 shows a sample page from the portal that provides a high-level dashboard of emissions, a list of reports, and a link to applications applicable to sustainability management. This view is typical of what an Analyst would see upon logging in to the solution. The dashboard represents some key performance indicators (KPIs) important to that institution. These KPIs can change based on project changes, strategy, or overall performance. The report links point to a set of standard emissions reports such as emissions by year, emissions by scope, and forecasted emissions.

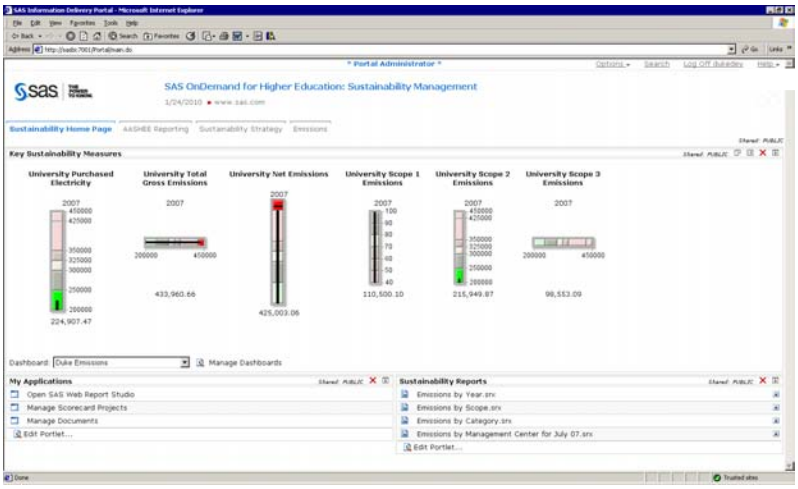

Figure 1: Sustainability Portal Provides Dashboards of Performance for Key Sustainability Metrics and Links to Sustainability Reports

AASHE STARS REPORTING

The solution provides not only dashboards and Web reports it also provides the ability to easily communicate performance using established higher education sustainability frameworks such as AASHE STARS. The STARS reporting tool allows institutions to use standards set by AASHE to input performance against the STARS metrics and see progress against their set goals to calculate percent of performance. If your institution is using the STARS program, you can track performance against the metrics in all of the categories (Education and Research, Operations, Planning, Administration, and Engagement). SAS is a member of AASHE and we are currently working with them to coordinate our solution with their online tool. Figure 2 shows the STARS metrics and points available. Points are input through a Web data entry form, and performance percentage is then calculated and displayed to the users. Goals and targets can be set based on both STARS goals and the institutions goals or targets. Icons such as colored stoplights, check marks, or thumbs up or down can be added to represent performance status. Data is summarized and averaged by category and conforms to the AASHE STARS rating system.

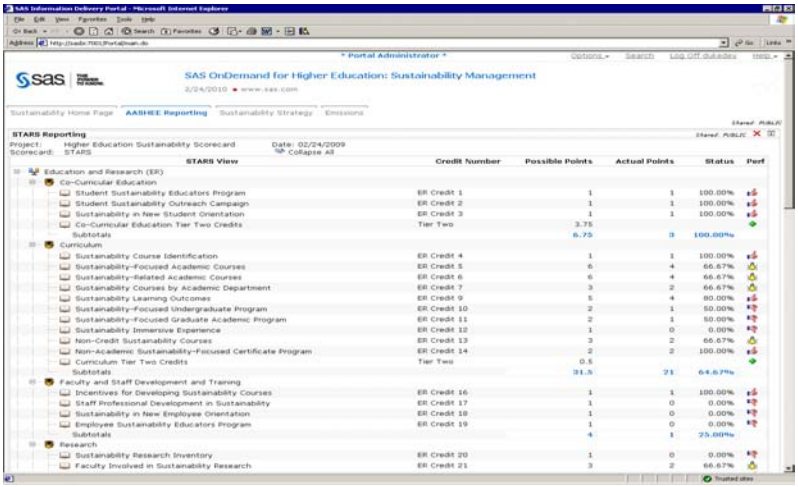

Figure 2: AASHE STARS Framework and Reporting

SUSTAINABILITY STRATEGY REPORTING

Some institutions might want to track and report on their own unique sustainability strategies. The SAS solution is flexible and provides the ability to create those strategies and report them to institution stakeholders. Users can view strategic metrics in a tabular format, a dashboard, or in a strategy map that visualizes the institution's strategy and performance. Figure 3 shows an example of an institution-specific strategy where you can track actual values against goals to show percent of performance.

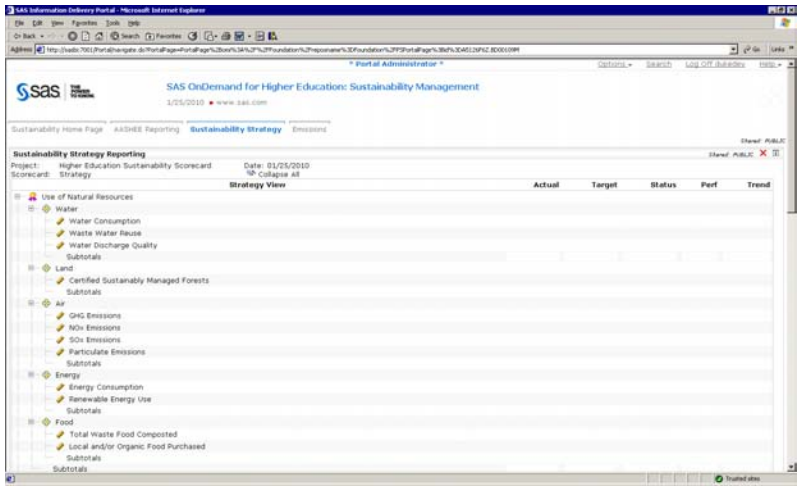

Figure 3: Sustainability Strategy That Is Institution Specific

DRILL DOWN REPORTING

In order to better manage sustainability, some of the institutional constituents might want to drill through the dashboards into the data and see more detailed reports, trend lines, or forecasts. The solution provides Web-based drill through reports to varying granularity. Reports can be generated on both relational data and Online Analytical Processing (OLAP) cubes. Figures 4-6 show examples of more detailed reporting provided in the solution based on relational data.

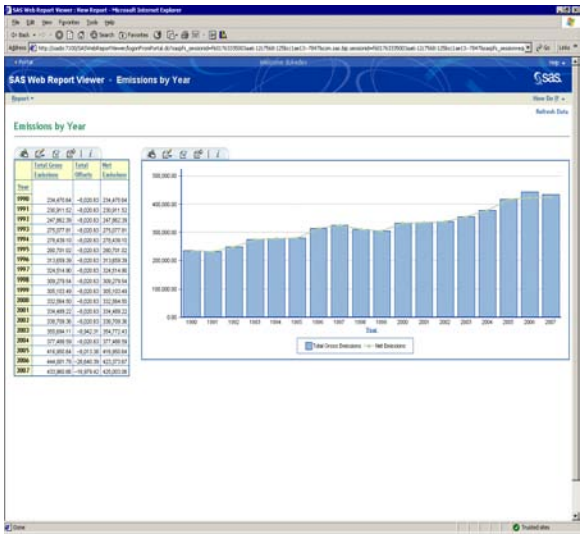

Figure 4: Sustainability Report of Emissions, Offsets, and Net Emissions by Year

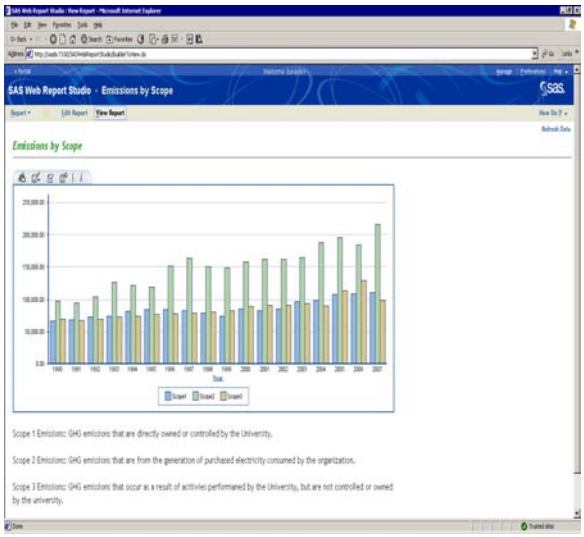

Figure 5: Sustainability Report by Scope by Year

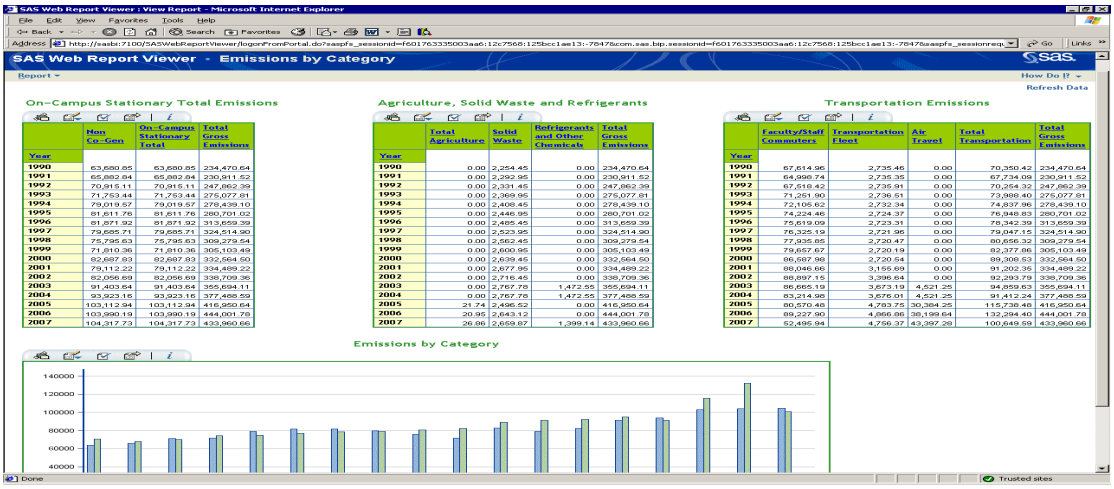

Figure 6: Sustainability report by type of emissions by year

GHG Modeling

Within the institution's Office of Sustainability, users will be able to view GHG models based on monthly data received as inputs through an FTP mechanism or through Web data entry forms, or both. The models are already pre-populated with fuel provider information based on Environmental Protection Agency (EPA) standards, but these rates can be modified if the institution has negotiated different rates with their energy providers. Once the data is received, the models are then calculated and the results can be viewed in a multi-dimensional format by buildings, square footage, departments and scope.

The Analyst can see key drivers of an emissions footprint. There are countless ways to display the model results, such as tables, line charts, or bar charts that include exception highlighting to better manage and develop insights. Once the Analyst has seen the model, they can change numbers based on assumptions, such as what will change when we implement a new energy savings system in three of our buildings. The new model becomes a what-if that helps the Analyst generate a forecast model. Figure 7 and Figure 8 show the GHG emissions modeling application.

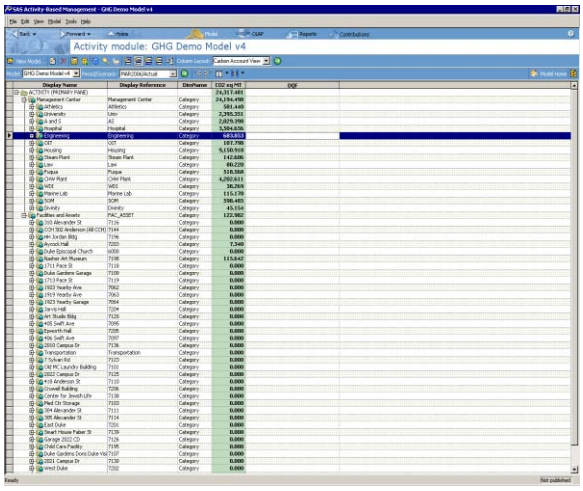

Figure 7: GHG Application Showing Carbon Equivalents in MT by Departments and Buildings

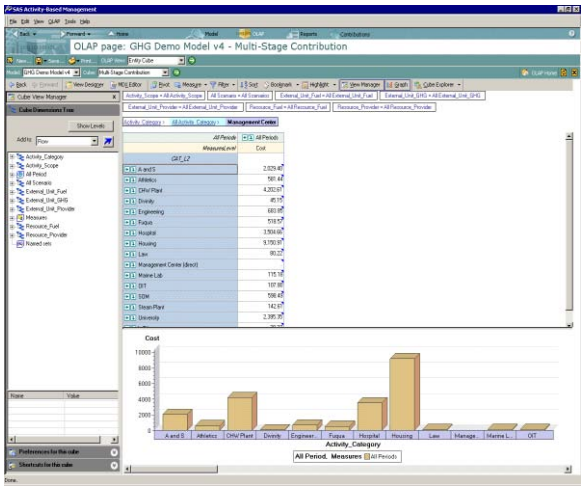

Figure 8: GHG Application Showing OLAP Capabilities

CONCLUSION

What better way for institutions to “SHOW THE GREEN” than through a hosted solution for their sustainability management? There are many wins with a solution requiring less IT overhead, and providing an automated and timely report update process that enables better sustainability insight and management. With multiple ways to upload the data, data management becomes much easier and more systematic. That data feeds the generation of GHG models and strategy reports within the hosted solution. Results are provided to constituents via a Web interface that provides easy to read and access dashboards and reports.

To be a sustainability leader in higher education, institutions must lead the effort with confidence, must educate our future leaders in the emerging landscape of sustainability, and must make better, faster decisions to demonstrate campus commitment to the sustainability effort. Today it is not enough to talk green, institutions must “Show Me the Green”. With a hosted solution, your institution can walk the talk and make reliable, fact-based decisions, improve cost efficiency, and increase constituent confidence by helping to answer more questions, provide more information to more people which in turn helps to drive behaviors to ensure the sustainability of our planet.

REFERENCES

- American Colleges and Universities President’s Climate Commitment (ACUPCC) http://www.presidentsclimatecommitment.org/
- Association for the Advancement of Sustainability in Higher Education (AASHE) http://www.aashe.org/

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author:

Name: Karen Patch
Enterprise: SAS Education Practice
Address: 1 SAS Campus Drive, U4166
City, State ZIP: Cary, NC 27516
Work Phone: (919) 531-8353
Fax: (919) 677-4444
E-mail: Karen.patch@sas.com
Web: support.sas.com

RECOMMENDED READING

To learn more about how SAS is addressing sustainability, read the SAS Corporate Social Responsibility Report at http://www.sas.com/corporate/corpgovernance/csr-report.pdf.