Translating Energy Performance Benchmarking into Organization-Wide Savings: The Citigroup Case Study

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ABSTRACT

Leaders in energy performance utilize portfolio-wide benchmarking as the foundation for effective energy management programs. Taking Citigroup as a case study, this paper explores strategies and tactics for establishing a corporate benchmarking and energy management initiative across a diverse, widespread portfolio of commercial properties.

By using the ENERGY STAR® Portfolio Manager tool to benchmark offices and bank branches across the world, Citi identifies poorer performers, verifies and communicates benefits from low-cost operational enhancements, prioritizes properties for capital improvements, and selects high-performing buildings to highlight best practices. Through these efforts, Citi is tracking energy performance improvements across more than 30 million ft^2 of real estate, and is pursuing efforts to expand benchmarking activities across its global portfolio.

Beyond reductions in energy, cost, and greenhouse gas emissions, Citi's benchmarking efforts also deliver significant benefits in terms of employee engagement and communications. By considering properties across the globe, Citi provides staff with the opportunity to be recognized for their local achievements – no matter how far from the corporate headquarters they are. This leads to high levels of employee buy-in, which helps to ensure the sustainability of the initiative.

Through this case study, our paper demonstrates how a portfolio-wide approach to benchmarking, and in particular the use of Portfolio Manager, provides an effective and transparent framework for translating *information* into *action*. Distilling the lessons learned through Citi's experience, the paper concludes by identifying a number of recommendations for organizations seeking to implement strategic energy management initiatives across multiple properties.

Introduction

Energy performance benchmarking is widely regarded as the critical first step in effectively managing the energy consumption of commercial buildings. For the past decade, the U.S. Environmental Protection Agency's (EPA) ENERGY STAR program has been the most visible proponent of this approach, promoting the Portfolio Manager benchmarking tool as a key resource for the voluntary measurement and tracking of commercial building energy performance. Through the end of 2009, more than 130,000 buildings had benchmarked as a first step towards managing energy consumption and reducing costs. In recent years, a number of

states and cities have further embraced benchmarking as a core element of their greenhouse gas reduction strategies, and some have mandated energy performance benchmarking through legislation and regulation.[1]

As drivers for benchmarking continue to arise, it is important to remember that benchmarking is part of a *process*, rather than an end in and of itself. Through benchmarking, property owners and operators obtain the necessary information to make knowledgeable decisions regarding the energy performance of their buildings. By embracing benchmarking as a point of entry into strategic energy management, as opposed to merely a mechanical process of data collection, commercial organizations take a significant step toward improving the financial and environmental impacts of their facility operations.

This paper explores the ways in which energy performance benchmarking can serve as the foundation for a successful energy management strategy – not just at individual properties, but also (and especially) when applied systematically across portfolios of buildings. Using Citi's experience as a case study, we will describe the successful implementation of a portfolio-wide benchmarking initiative, and will illustrate how this effort has positioned the organization to pursue ongoing improvements in its buildings throughout the world. We will conclude by offering recommendations for other organizations that are interested in pursuing similar efforts.

Overview of ENERGY STAR and the Role of Portfolio Manager in Energy Performance Benchmarking

In 1995, the U.S. Environmental Protection Agency (EPA) launched the ENERGY STAR program for commercial buildings. Drawing upon the success of its precursor program, *Green Lights*, ENERGY STAR was designed to help businesses improve both the financial and energy performance of their buildings. Moving beyond a specific focus on commercial lighting systems, ENERGY STAR sought to encourage and assist building owners and operators to pursue improvements in energy efficiency across the entire property – taking into account all building systems and fuel types.

At the time, however, the market lacked the ability to differentiate higher-performing buildings from lower-performing buildings. Unlike the miles-per-gallon rating for automobiles, which makes it possible to objectively compare the efficiency of one car against another, there was no similar metric for buildings. In the absence of a simple, straightforward means of comparative assessment, it was difficult to promote improvements in whole building energy efficiency, let alone to recognize the improvements of industry leaders.

In response to this challenge, EPA developed a process for providing commercial buildings with a straightforward, easy-to-communicate energy performance measurement. For each eligible building type, EPA uses data from the national Commercial Building Energy Consumption Survey (CBECS)[2] to create a statistical model that correlates energy consumption data with key building operational characteristics. When a user enters specific operational parameters for a given property, such as building size, location, number of occupants, number of PCs, etc., the model estimates how much energy that particular building would use if it were the

[1] For more a complete list of states and cities that have implemented benchmarking mandates, see the fact sheet "State and Local Governments Leveraging ENERGY STAR," available online at http://www.energystar.gov/ia/business/government/State_Local_Govts_Leveraging_ES.pdf.

[2] For more information about CBECS, a national survey conducted every four years by the Energy Information Administration, see http://www.eia.doe.gov/emeu/cbecs/contents.html.

best performing, the worst performing, and every level in between. The system then considers the actual energy consumed by the building (based on user input of utility data) to determine where it ranks relative to its peers, and delivers a score on a scale of 1 to 100 to communicate this performance.

The 1-to-100 scale is designed to reflect the distribution of energy efficiency across the U.S. building stock, and each point on the scale reflects one percent of similar buildings. So, a property with a rating of 50 is scoring in the 50th percentile of similar buildings nationwide (the national average), while a building scoring a 75 is in the top 25th percentile of similar buildings nationwide. In this manner, buildings from around the country can assess their energy performance using the same scale, which takes into account differences in size, climate, and operational attributes in order to deliver an objective, 1-to-100 score that can be easily understood and communicated.[3]

The first energy performance scale, for office buildings, was released in 1999. Subsequent models have expanded the reach of the system to include other commercial building types such as acute care and children's hospitals, retail stores, supermarkets, warehouses, hotels, K-12 schools, and even data centers. Today, over half of all U.S. commercial building square footage is eligible to receive a 1-to-100 score using this tool.

In addition to the 1-to-100 energy performance score, EPA designed a Web-based interface through which property owners and operators could access the rating system and store information regarding their buildings. This tool, called Portfolio Manager, was released to the public in 2000. Portfolio Manager allows users to benchmark individual properties using the 1-to-100 scale, as well as to measure and track the energy performance of entire portfolios of owned and/or managed properties. Since the release of this tool a decade ago, Portfolio Manager has undergone regular updates to enhance its functionality, including the integration of water consumption and greenhouse gas emissions tracking. To date, more than 130,000 commercial buildings have benchmarked their energy performance using Portfolio Manager.

Over time, EPA has distilled the successful practices of its leading ENERGY STAR partners into a set of guidelines for strategic energy management.[4] A key step in these guidelines is for building owners and managers to assess energy performance, using Portfolio Manager to benchmark where possible. In particular, the guidelines note that some of the most successful ENERGY STAR partners are using Portfolio Manager to rate building performance across *entire portfolios*, thereby providing energy managers with the ability to more readily identify and select inefficient buildings for upgrades.

This finding is especially important, insofar as it touches on the issue of limited resources. Property owners and managers rarely have the financial capacity, or even the time, to implement energy upgrades across an entire portfolio of properties (whether this portfolio consists of 2 buildings or 2,000 buildings). This means that choices must be made regarding the allocation of limited resources. In the absence of any other decision criterion, however, resources are often devoted to the largest and/or most visible properties, as opposed to those buildings with the greatest opportunity for improvement. By using benchmarking results to prioritize and strategically plan the application of upgrades and operational enhancements, property owners can attain the most significant energy and cost savings for the time, money, and effort invested.

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[3] For further technical details regarding the EPA's energy performance rating system, see http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager_model_tech_desc

[4] For more information, see http://www.energystar.gov/index.cfm?c=guidelines.guidelines_index.

The focus on portfolio-wide benchmarking and the use of Portfolio Manager as a decision-making tool is a critical message that ENERGY STAR has delivered to the marketplace over the past decade. The next section of this paper focuses on the experience of one ENERGY STAR partner, Citi, in order to illustrate a successful application of this approach. This case study explains how Citi has structured a global energy management strategy around the use of Portfolio Manager, and demonstrates how the organization has moved beyond the technical aspect of benchmarking (i.e., data entry) in order to develop a coordinated and comprehensive program that uses benchmarking results to identify poorer performers, verify and communicate benefits from low-cost operational enhancements, prioritize properties for capital improvements, and select high-performing buildings to highlight best practices. Following this case study, we provide a summary of how these lessons may be applied by commercial real estate owners, operators, and other interested parties seeking to influence the uptake of strategic energy management activities across a group of buildings.

Case Study: Citi's Energy Management Initiative

As one of the world's leading financial service institutions, Citi maintains a real estate portfolio of more than 80 million square feet of space across 12,500 locations and over 100 countries. Over 40 percent of this is office space; another 40 percent consists of retail locations; and the balance is spread out across a number of data centers, operations facilities, and other real estate. Citi's corporate real estate organization, Citi Realty Services (CRS), is divided into operating regions covering all continents, including North America, Latin America, Europe, Middle East and Africa (EMEA), and Asia Pacific (APAC).

In 2006 Citi made a corporate commitment to achieve a 10% reduction in greenhouse gas emissions across its global operations by 2011, measured as an absolute reduction against 2005 levels.[5] Since the bulk of Citi's greenhouse gas emissions result from the energy consumed in operating its facilities, it became clear that this goal could only be achieved through strategic energy management, and that CRS would need to spearhead this effort.

When this commitment was made, CRS had already achieved some progress with regard to the tracking of energy data across its portfolio: all property managers were required to log the utility consumption for their properties into a centralized corporate database. At the time, however, the primary function of this database was to collect and house data; the tool was not sufficient for actually measuring and comparing energy performance across such a geographically and functionally diverse collection of facilities. Furthermore, given the significant business expansion that was taking place during the mid-2000s (Citi's real estate portfolio expanded by as much as 10 million square feet in one year), this tool was viewed by many property managers as an administrative burden that competed with other responsibilities.

In 2007, CRS organized a global group to focus on sustainable real estate operations. In light of the company's aggressive GHG reduction goal, CRS recognized that it would need to break through the geographic silos within which it had traditionally operated, and to examine operations across facility types. Turning to its internal utility tracking database, CRS had access to a comprehensive record of energy consumption for all facilities dating back to 2000. Using this information, CRS developed a series of reports to help regional managers view the performance of their properties, and how this performance related to historical trends.

[5] This goal was subsequently expanded to target reductions of 25% by 2015.

Translating *data* into *action*, however, was more difficult than anticipated. The underlying problem that emerged was how to effectively compare the performance of buildings within a single region that stretched from Canada to Florida, let alone across a global portfolio that spanned more than 100 countries. For this reason, CRS began to look for additional resources that could help to support a robust energy management program.

Citi Engages with ENERGY STAR and Portfolio Manager

Citi soon recognized that EPA's ENERGY STAR program could play a major role in this effort. In particular, by leveraging the 1-to-100 energy performance score provided by EPA's Portfolio Manager benchmarking tool, CRS could employ a consistent methodology in comparing the performance of its diverse and widespread properties. This would provide regional and on-site managers with more tailored information from which to direct energy management efforts. In early 2008, CRS decided to begin entering several years of utility consumption data from its internal database into Portfolio Manager.

To generate support for this initiative, CRS selected 50 of its largest U.S. facilities to participate in a pilot benchmarking effort. Once these properties were successfully entered into Portfolio Manager, CRS shared the benchmarking results with regional management and facility operations staff. Among the early success stories were two notable properties in New York City, 388 Greenwich Street (1.7 million square feet) and One Court Square (1.4 million square feet). Through the use of Portfolio Manager and EPA's rating scale, CRS discovered that both of these properties were immediately eligible for ENERGY STAR label. This recognition validated the efforts that had been made over the previous years to improve the energy performance of these buildings, including: adjusting temperature setpoints; reducing lighting in unoccupied areas; rezoning the HVAC systems; updating building management systems; installing variable frequency drives on fans and pumps; installing motion sensors; and monitoring steam traps to reduce losses. In addition to official acknowledgement gained from EPA in the form of the labels, the information generated through this benchmarking effort also allowed Citi to internally recognize the efforts of the property managers at these and other facilities In this way, facility staff began to understand that benchmarking provided an opportunity to showcase their efforts, and to gain management attention for a job well done.

Based on a positive response to this pilot initiative, Citi expanded its benchmarking efforts. Citi leveraged ENERGY STAR support to provide benchmarking trainings to property managers across the U.S, while the CRS Sustainability Group took on the responsibility of training regional staff located outside the U.S. By mid-2009, Citi had offered 10 live, Web-based trainings, in multiple languages, to more than 300 property managers from across the globe. In addition to this core training platform, each CRS regional manager was tasked with holding follow-up training sessions with their team members to further explain the nuances of using the Portfolio Manager tool, its reporting capabilities, and the interpretation of the tool's results and metrics.

Given the size of the Citi portfolio, CRS implemented a centralized, standardized approach to benchmarking in order to ensure the proper input of energy and space use data, as well as consistent reporting. In particular, CRS tasked a small group of individuals operating at a global level to manage the setup and administration of the buildings entered into Portfolio Manager. Because energy data were available to these administrators via the CRS utility tracking

database, this approach made it possible for property managers (particularly those managing larger groups of buildings and branches) to avoid handling rote data entry.

According to this division of labor, the central administrators were responsible for entering new buildings into Portfolio Manager, along with basic space use attributes, and for coordinating reporting at the global and regional levels. Regional managers were tasked with reviewing reports for their specific portfolios, determining priorities for energy management activities, and disseminating information to property managers as necessary. Finally, property managers were assigned responsibility for maintaining accurate space attributes for their properties within Portfolio Manager, and for generating more detailed reports on the status of their buildings. As the staff most familiar with the operations of individual facilities, property managers were also asked to set performance goals for their facilities based upon identified opportunities for improvement. These goals were translated back up to the regional and global levels to assist in the distribution of resources needed to achieve improvements.

As a result of these efforts, in only 18 months the Citi benchmarking program was expanded to include over 100 large properties (e.g., office buildings, operations centers), and more than 1,600 bank branches from across the world. Figure 1, below, shows the breakdown of Citi's benchmarking efforts by region. As of the end of 2009, 54 of Citi's U.S. buildings and branches had earned the ENERGY STAR label, signifying energy performance in the top 25% of similar buildings nationwide.

Figure 1. Snapshot of Citi's Benchmarked Portfolio Through Year-End 2009

Region	Large Properties		Branches		Total	
	Facilities Benchmarked	SF of Facilities Benchmarked	Facilities Benchmarked	SF of Facilities Benchmarked	Total Number of Facilities Benchmarked	Total SF of Facilities Benchmarked
EMEA	13	1,510,017	151	528,697	164	2,038,714
LatMex	17	2,428,016	530	2,356,672	547	4,784,688
Northeast	11	6,012,491	217	1,424,324	228	7,436,815
US/Canada	57	9,535,596	480	2,827,080	537	12,362,676
Asia Pacific	8	1,432,766	254	1,550,016	262	2,982,782
Total	**106**	**20,918,886**	**1,632**	**8,686,789**	**1,738**	**29,605,675**

Source: Citi Realty Services, 2010

Citi Uses Benchmarking Data to Recognize Best Practices and Prioritize Improvements

Once enough buildings were benchmarked in Portfolio Manager, Citi began focusing on improving the energy performance of these properties. Citi understood, however, that it did not make sense to install replacement chillers, lights, or other common building system improvements if property managers could not operate them to peak efficiency. Furthermore, Citi knew that efficient operations should define the baseline for any highly effective and properly-evaluated retrofit project. For this reason, Citi focused on implementing operational best practices in its buildings before considering any major upgrade projects.

For a number of years, CRS has promoted a *Quick Wins* initiative, which helps facility staff to identify low-cost energy saving best practices for application at their properties. These

best practices are communicated across all Citi facilities via a global education platform, ensuring that they are effectively transmitted and properly deployed. Some of these practices can be summarized as follows:

- Adjusting HVAC setpoints and use of outdoor air based on the season
- Reviewing operating hours to ensure that lighting and space conditioning are only provided when and where needed
- Eliminating the use of personal appliances
- Turning off all forms of equipment when not in use
- Minimizing outdoor lighting
- Replacing incandescent light bulbs with compact fluorescents
- Focusing on preventative maintenance (cleaning filters and coils, calibrating thermostats)
- Communicating efforts and engaging building occupants

Portfolio Manager proved to be a valuable tool for validating these best practices. Citi worked with facility managers of high scoring buildings to identify the practices that had helped to drive superior energy performance. For example, one of Citi's ENERGY STAR labeled buildings, located in Delaware, was benchmarked using multiple years of historical data. Through this analysis, the property manager was able to confirm that by using the *Quick Wins* program recommendations, the building had improved in rating from below 30 (in the early 2000s) to above 75 (in 2008) And, by continuing to track energy performance in Portfolio Manager, Citi further validated the success of these best practices as the scores of other lower-performing buildings began to improve.

Having established a system for identifying and communicating energy management best practices across its global portfolio, the next phase in Citi's energy management program is to make targeted investments in energy-based retrofits and infrastructure improvements. In support of this effort, Citi has partnered with the Clinton Climate Initiative (CCI) to work with energy service companies (ESCOs) to identify retrofit opportunities and to implement these projects across 75 large properties. Citi's benchmarking efforts using Portfolio Manager continue to lay the foundation for all of this activity. After properties have had sufficient opportunity to implement and assess the impact of low-cost best practices, those facilities still receiving the lowest energy performance scores are identified as potential candidates to begin working with ESCOs to implement more intensive capital improvements. After undertaking a comprehensive review of building energy performance and designing an energy retrofit plan, the goal is to help each participating property achieve a score of 75 or higher, and to pursue the ENERGY STAR label where eligible. By selecting the lowest performers to go through this process, Citi ensures that it is maximizing the energy savings achieved through capital projects.

This triage approach based on the ENERGY STAR rating is especially important for prioritizing projects and allocating resources. Through the use of Portfolio Manager and the 1-to-100 rating, Citi has learned that some of its larger buildings, and even those with the highest energy intensities, do not necessarily present the best opportunity for energy savings. As a case in point, in Citi's Latin America portfolio, CCI participant buildings were chosen almost entirely based on low ENERGY STAR ratings, rather than property size or media visibility. This selection methodology also serves as an important leveling process across the Citi portfolio:

since many of Citi's larger, urban facilities already have dedicated technical resources to manage energy, smaller or more remote facilities can often benefit much more from the technical assistance that comes from participation in the CCI program.

Leveraging Benchmarking Activity to Engage Citi Staff Across the Globe

As the Citi benchmarking effort has progressed, property managers have realized that there are professional and personal benefits to participation, aside from saving energy and money for the company. News of significant achievements, both in terms of high ratings and rating improvements, is shared across regions via newsletters, e-mail, and regular conference calls, which allows individual property managers to gain recognition for their efforts. And of course, a spirit of healthy competition helps to drive the effort forward: not only does each CRS region want to demonstrate its achievements to the others, but within each region, property managers also strive to achieve individual accomplishments (e.g., the largest number of buildings benchmarked and/or receiving the ENERGY STAR label; the greatest improvement in energy performance; the highest energy performance scores).

Even though the ENERGY STAR label can only be obtained by properties located within the United States,[6] Portfolio Manager can still be used to measure and track the performance of properties across the globe.[7] This is extremely important to CRS, since its energy management program must embrace all operating regions in order to achieve Citi's GHG reduction target. For Citi's international operations, benchmarking in Portfolio Manager and the ability to earn the 1-to-100 energy performance score provides encouragement to facility managers to pursue energy management activities. In fact, CRS recognizes international properties that earn a score of 75 or higher in Portfolio Manager, even though these properties are not eligible to earn the official ENERGY STAR label from EPA. To receive this internal recognition, CRS requires property managers to submit a Statement of Energy Performance, and to have a professional engineer review and verify their application just as they would in applying for a label in the U.S. Upon approval, qualifying properties receive a certificate signed by the CRS division executive and the managing director responsible for the region.

To date, Citi has recognized properties in the UK and Ireland, Belgium, Turkey, Poland, Argentina, and Mexico, with dozens more in the review process from across Asia, Latin America, Europe, Africa, and the Middle East. Each of these facilities displays the Citi certificate in recognition of their accomplishments. In this way, benchmarking has been a common theme that has encouraged participation across borders and across corporate "silos," and that has created a sense of shared purpose. Looking ahead, Citi will be expanding its internal recognition program to identify those properties that have improved their energy performance by 10% or more, consistent with the ENERGY STAR Challenge.

[6] Or international properties that are owned and occupied by the U.S. government, and meet U.S. construction codes.
[7] Portfolio Manager allows for the entry of buildings located in non-U.S. countries. Users select the country and nearest major city, and Portfolio Manager uses the climate profile for that city to conduct weather normalization.

Citi's Portfolio-Wide Improvements in Energy Performance

As Citi's energy management program proceeds, improvements are measured at the facility level and aggregated at the portfolio level through the use of Portfolio Manager. As of the end of 2009, Citi had achieved an energy use reduction of more than 12% across all of the properties it was tracking, compared to a base year of 2005. This is especially impressive considering that, up through 2009, Citi had made only limited and localized investments in energy retrofit projects, relying instead on the implementation of low-cost best practices to generate the bulk of the organization's energy savings. Across the 21 million square feet of office space being actively tracked in Portfolio Manager as of the end of 2009 (about 25% of Citi's entire global real estate portfolio), Citi achieved an average ENERGY STAR score of 70 – an improvement of 12 points compared to 2005. Similarly, through the end of 2009, Citi's benchmarked portfolio of bank branches had achieved an improvement in average score from 40 to 54, as compared to 2005.

In 2009, Citi achieved a portfolio-wide energy savings of approximately $64 million, as compared to 2008. While some of these savings resulted from reductions in space, divestitures of business units, and successful energy purchase policies in deregulated markets, CRS determined that $8.6 million of the 2009 savings came from the implementation of energy management best practices, such as those promoted through the *Quick Wins* initiative. And as the current economic environment has brought cost-cutting and capital preservation to the forefront of Citi's focus, so too have CRS' energy management efforts achieved recognition and support from the very highest levels of the organization.

Next Steps for Citi

Given the success of its benchmarking initiative to date, Citi plans to expand this effort further. Of Citi's 12,500 facilities worldwide, more than half are direct-billed by utility companies or landlord energy meters, and are being tracked in the CRS internal utility tracking database. Therefore, Citi has as many as 5,000 additional facilities remaining to be benchmarked before it can claim to be tracking 100% of its facilities with access to actual consumption data.

To prepare for the management of nearly 7,000 facilities in Portfolio Manager, Citi designed and built out an automated benchmarking link between the CRS utility tracking database and Portfolio Manager. As of December 2009, this connection was completed, tested, and placed into service, giving Citi the means to further expand its benchmarking capabilities through electronic data transfer. With this resource in place, Citi is prepared to pursue yet another ambitious goal. As set forth in its 2009 Citizenship Report,[8] Citi is seeking to improve the energy performance of its global portfolio by 20% by 2015 (compared to a baseline of 2005), and has specifically identified Portfolio Manager as the tool that will be used to measure this improvement.

[8] Citi's 2009 Citizenship Report can be accessed at http://www.citigroup.com/citi/citizen/assets/pdf/citi.pdf.

Discussion

Citi's experience in developing a portfolio-wide benchmarking initiative can be useful for other organizations seeking to leverage the power of benchmarking as a foundation for strategic energy management programs. And while the particulars of Citi's structure (e.g., international portfolio, centralized utility database, decentralized facility management) may not resonate precisely with all audiences, the lessons learned here should have relevance for any organization that is trying to effectively allocate resources to achieve energy efficiency improvements across a portfolio of buildings. Beyond owners and operators of commercial real estate, such organizations could include municipalities, states, and/or other entities that must decide how to direct program resources (e.g., time, effort, incentive dollars, technical assistance) to ensure the greatest possible energy and cost savings.[9]

The Citi experience demonstrates that there are a number of core considerations to successfully design and implement a portfolio-wide benchmarking initiative using a tool such as EPA's Portfolio Manager. Many of these considerations will echo the ENERGY STAR Guidelines for Energy Management; however, our goal is to identify specific recommendations as they relate to a large-scale benchmarking effort. These observations and recommendations include the following:

- ***Capitalize upon management support.*** Consistent with the ENERGY STAR Guidelines for Energy Management, Citi's experience underlines that the most effective energy efficiency programs obtain clear buy-in from upper management. Where possible, organizations should leverage senior-level mandates to set the tone for benchmarking efforts. Especially if staff and team members are hesitant regarding new initiatives, top-down direction can be critical for getting everyone on board while they are learning about the value that benchmarking can deliver in terms of energy and cost savings.
- ***Identify roles and responsibilities.*** Citi assembled a core team to design and implement its energy management initiative, in keeping with the ENERGY STAR Guidelines. In particular, Citi's benchmarking effort demonstrates the importance of clearly identifying and assigning responsibility for both technical and organizational activities. For example, who will serve as the overall Portfolio Manager administrator? Who will be responsible for entering each property into the benchmarking tool? Will there be different parties responsible for managing energy data, facility space data, and reporting, and what will be their responsibilities? Each role should be clearly identified, and training and educational resources should be provided to ensure that each player is adequately prepared. All individuals involved in the benchmarking effort should understand and be able to communicate how this particular initiative fits into the organization's broader energy management strategy.
- ***Decide if there is a role for automation.*** Is energy data handled at the property level, or is it collected at the corporate level? If there is a centralized database for energy consumption information, or if an organization is working with a utility information service provider that manages its energy data, there may be an opportunity to develop an automated feed into Portfolio Manager. This feed could be established directly from a

[9] Utilities and energy efficiency program sponsors can also leverage the portfolio-wide benchmarking model, as has been demonstrated by PG&E's "More than a Million" program. For more information, see http://www.energystar.gov/ia/partners/reps/ci_program_sponsors/downloads/PGE_MTM_Case_Study.pdf.

company database, as in Citi's case, or via one of many ENERGY STAR Service and Product Providers that offer automated benchmarking services.[10] Although this process may take some time and/or resources to put into place, automated benchmarking can ultimately reduce the amount of time and effort needed for benchmarking on an ongoing basis.

- ***Consider starting with a pilot initiative.*** Before launching into a full benchmarking effort, organizations should consider starting with a smaller sample of properties. As Citi discovered, this approach will help corporate management, as well as facility-level participants, to develop a level of comfort with the process, and to test the scalability of the approach. Like Citi, organizations that communicate early achievements (e.g., number of buildings benchmarked; number of buildings qualifying for the ENERGY STAR) generally create momentum and buy-in across facility management staff.
- ***Focus on benchmarking first.*** All too often, organizations seeking to establish an energy management program want to focus on energy performance improvements before they have fully established their benchmarking process. As a first step, however, it is critical to develop an accurate baseline against which all improvement can be measured. In order to do this, it is important to develop a process flow that is logical, replicable, and that ensures the quality of the data entered into Portfolio Manager. Once this process is in place, organizations can turn their attention towards energy improvements, knowing that they have established a meaningful starting point against which to measure success.
- ***Use benchmarking results to identify and recognize top performers.*** One of the key messages from Citi's experience, as well as from other successful organizations, is that building owners and managers should not limit their attention to the best-performing buildings. It is important to pursue the ENERGY STAR recognition for these properties in order to encourage others. However, be sure to identify the best practices that helped these buildings achieve high performance, and communicate these findings broadly so that others can benefit.
- ***Implement best practices across portfolio.*** Before considering capital-intensive retrofits, leverage best practices (and especially low-cost, operational improvements) to the extent possible to achieve energy improvements. Even those properties that are still underperforming will have established more efficient baselines against which to track subsequent improvements. Regardless of the level of building performance achieved through best practices, these early energy reductions will deliver cost savings that can be leveraged upward into further efficiency efforts.
- ***Use benchmarking results to identify prime candidates for investment.*** Use benchmarking results to identify the poorest-performing properties – i.e., those that have the greatest opportunity for improvement. While there are likely to be additional considerations that factor into this decision (such as predicted return on investment, internal rate of return, and/or net present value of the proposed retrofit), lower performing buildings will generally provide the best opportunity to achieve greater energy and cost savings for the money and effort invested.
- ***Verify energy reductions through continued benchmarking.*** Benchmarking is not a one-time event, nor simply a precursor to energy improvements. After benchmarking a property, be sure to continue updating energy and space data on a regular basis, in order to verify that expected savings are being achieved at the level of the whole building.

[10] For more information, see https://www.energystar.gov/index.cfm?c=spp_res.pt_spps_automated_benchmarking.

- ***Communicate achievements.*** Throughout the process described above, be sure to communicate efforts internally and to provide regular status updates to team members. Establish a process for recognizing achievements, and even consider introducing an element of friendly competition to drive participation. As Citi found, the strong desire of regions and even individual property managers to gain recognition was the major driver that secured the take-off of the benchmarking initiative. As appropriate, use benchmarking data to support public announcements, including progress towards established goals. Leverage the value of ENERGY STAR partnership to communicate efforts and accomplishments within the context of a nationally-recognized program.

Readers may be able to identify additional considerations beyond those listed above. At a minimum, however, a well-designed benchmarking program should incorporate these components in order to serve as the basis for a successful energy management program.

Conclusion

In this paper, we have discussed the evolution of the portfolio-wide approach to benchmarking; we have provided a real-world example of an organization that has achieved energy management success through such an approach; and we have attempted to distill the experience of this organization into a set of observations and recommendations for other groups interested in following a similar path. While our broader goal is not to establish a prescriptive, one-size-fits-all approach to energy performance benchmarking, we do seek to demonstrate that benchmarking can and should be viewed as more than simply a technical process, or even a legal mandate. Especially when applied across a portfolio of buildings, benchmarking can provide property owners and operators with the information necessary to make investment decisions; can help to identify and validate best practices; and can serve as a means to communicate energy management efforts, deliver cost savings, and to drive participation across a team.