Recommendations and Best Practices for Benchmarking Multifamily Buildings

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Opportunities and Challenges for Benchmarking Multifamily Housing

Benchmarking energy consumption data provides a basis for the screening of properties and building portfolios for the greatest energy savings opportunities. Benchmarking alone provides little value-added unless complemented with opportunities to use the data to identify and maximize energy savings. Utilities have used benchmarking to improve multifamily program redesign and in some cases, offer tiered levels of service to segment customers. Moreover, whole-building benchmarking strategies enhance the ability of utilities to reach their energy efficiency goals by improving outreach to building owners/managers, screening criteria for incentive and rebate program eligibility, and targeting strategies to reach and prioritize customers that are willing to undertake deeper retrofits based on tenant energy consumption data.

Major challenges with developing an automated system for aggregating whole-building energy consumption data and automated upload to a comparison platform such as EPA's ENERGY STAR Portfolio Manager (Portfolio Manager), include: (1) developing the technological infrastructure to support the system and (2) addressing the appropriate privacy protections on releasing consumer data. Despite these challenges, utilities are in a unique position to facilitate and scale-up energy-performance benchmarking of multifamily buildings. Currently, many building managers/owners charged with benchmarking pull individual tenant data and manually enter it into the online EPA tool, Portfolio Manager. In some states, disclosure regulations limit the ability of owners to get this data in the first place. This process can be exceedingly burdensome for building owners/managers and has serious potential for human error.

In response to a greater demand for building consumption data, an increasing number of utilities are beginning to streamline these efforts by aggregating whole-building data, keeping individual tenant information anonymous. These practices relieve owners of manually inputting, in some cases, hundreds of tenants' data and also greatly improve accuracy in reporting. In addition to providing anonymized whole-building data, utilities have begun to automatically upload the aggregated consumption data into Portfolio Manager (i.e., [Automated Benchmarking Services](#)). Some utilities have set-up the technological infrastructure to implement a "set it and forget it" system that streamlines the efforts to aggregate monthly data and have it automatically upload to Portfolio Manager.

In short, automated benchmarking of the multifamily housing sector provides various benefits for building owners and utilities in terms of meeting energy savings goals. Data access programs can directly improve the operations, allocation, and the overall cost effectiveness of utility-saving investments for multifamily housing and enhance a building owner's ability to conduct benchmarking and actively engage with utilities, especially those with low benchmark scores.

Not included in this memo is a discussion of the policy drivers that can encourage benchmark reporting and data disclosure for whole-building assessments in the multifamily housing sector.

State and local building benchmarking and disclosure polices and laws are emerging in many jurisdictions requiring commercial and multifamily building owners to measure and report the energy performance of their buildings. Energy disclosure laws have been found to catalyze and expand current energy efficiency programs as owners and their potential tenants are able to evaluate the relative efficiency of their buildings.[1]

Effective Strategies and Approaches for Automated Benchmarking:
ACEEE identified common strategies for developing an automated system and maintaining proper privacy protections and recommendations for utilizing multifamily energy consumption data once whole-building, aggregated data is collected and an automated system is in place. Below are our recommendations based on this research.

Automate end-to-end data retrieval and reporting
Several utilities have begun whole-building aggregation of data and automated downloading into Portfolio Manager.[2] When designed correctly, an automated system for inputting energy consumption data into a benchmarking tool is intended to be user-friendly, reduce labor over time, and decrease human error in benchmarking. The best utility data access programs have incorporated automation techniques into data collection, entry, request, and reporting practices. In addition, many current utility access programs were developed quite rapidly in response to a growing customer demand due to state and local benchmarking mandates and did not develop a baseline to set how data access would impact the utility's internal operations. Thus, ACEEE recommends that the utility identify a minimum set of values to capture the full value of the benchmarking program. Existing research does not point to common data points as impact tracking is not occurring or if so, at a very small scale within existing utility-led programs.

- **ComEd's** Energy Usage Data tool has become the leading example of an endtoend automated utility data access program. Building owners create one time and reoccurring requests using an online Dashboard platform, enter their portfolio of buildings, verify the tenants that reside in the building (tenant-level data is not released), and view whole building energy usage data per month. The aggregated consumption automatically uploads to Portfolio Manager. ComEd's technical staff worked very close with EPA staff to design the system for data exchange between ComEd's Dashboard and EPA's Portfolio Manager. The Energy Usage Data tool provides building owners with whole building Data Usage totals per month (kWh) and data is delivered to customers in 1-2 days following the data request.

- Similarly, **Puget Sound Energy's** MyData tool (formerly called Automated Benchmarking) provides whole building energy usage data from PSE upon request. Building managers and owners can request that the data be populated to their Portfolio Manager account or simply request the data in an Excel spreadsheet for other purposes (excel sheets will include more details on energy usage). Data is delivered to customers

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[1] For more on local and state policies that support energy transparency in the multifamily housing sector, see the Institute for Market Transformation's 2012 report, Energy Transparency in the Multifamily Housing Sector: Assessing Energy Benchmarking and Disclosure Policies.

[2] For a complete list of utility data access programs, see the Institute for Market Transformation's 2013 report, Utilities' Guide to Data Access for Building Benchmarking.

in a few days following the data request. A chief criticism of PSE's current service is that it does not have a recurring request (subscription) feature. However, a similar system developed by **Seattle City Light**, and similar to ComEd, uploads aggregate building data every three months, basically eliminating the need for any intervention on the part of the building owner unless changes to the building's meters have occurred.

Conduct customer outreach and education

Data access programs are most successful when accompanied with adequate training and outreach to building owners and managers. While automated systems take much of the burden off these customers, they are dependent upon tenant verification and other building data that occurs during the data request phase. Utilities that operate a data access program should develop customer how-to-guides, step-by-step documents with pictures and diagrams and in some cases, develop online trainings such as webinars.

- To better ensure a functional and user-friendly system, **ComEd** consulted with their marketing and IT departments, billing system, legal team, the EPA, account managers, customers, customer service representatives, and third party service providers when designing their Energy Usage Data tool.[3]

- **Austin Energy** developed a comprehensive online guide, How to Benchmark Your Building/Facility, to assist building operators with benchmarking and uploading to Portfolio Manager.

ACEEE also recommends that the utility set up an automated data exchange through Portfolio Manager. Despite criticism from some users, Portfolio Manager is the data reporting tool most widely used by commercial building owners and managers to fulfill state and local benchmarking mandates and for comparison purposes. It has become the leading standardized format for reporting energy usage and for energy performance scoring. EPA will release a Multifamily ENERGY STAR score (1-100 energy performance score) in Fall 2014 so it is anticipated that the demand for exchange into Portfolio Manager will increase as building owners will be able to compare and rate their building's energy consumption against national and regional peers.

- In non-multifamily buildings, a survey of hundreds of facility managers who used Portfolio Manager found that roughly 70 percent have used ENERGY STAR ratings to guide and justify energy efficiency upgrade plans and projects.[4]

Address data authorization and privacy concerns

By aggregating consumption data for all energy meters in a building and sending a single consumption number to the building owner each month, utilities can help to overcome the need

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[3] Institute for Market Transformation. 2012. *Energy Transparency in the Multifamily Housing Sector: Assessing Energy Benchmarking and Disclosure Policies*. Available at:
http://www.imt.org/uploads/resources/files/Energy_Trans_MFSector_IMT_Final.pdf

[4] Audin, Lindsay. 2011. *Careful Assessment of Energy Options Can Show What Steps to Take*, Building Operating Management. Available at: http://www.facilitiesnet.com/powercommunication/article/Careful-Assessment-of-Energy-Options-Can-Show-What-Steps-to-Take--12849.

to obtain permission to capture each tenants' data while still satisfying the confidentiality regulations governing the utility's release of customer data. Where possible, utilities should have a separate release policy for monthly, aggregated multifamily residential energy consumption data that will mask individual consumption behaviors. This release form should be distinct from single-family homes and other commercial buildings.

In smaller buildings (<5 accounts) privacy concerns are a bit more complicated since there is an opportunity to identify energy usage with a particular tenant. In order to protect privacy of tenants in smaller buildings, several utilities require authorization from each tenant since there is a heightened risked that a third-party could discern tenant consumption data from the aggregated sum. There is no set threshold across jurisdictions in terms of how many accounts per building are needed to ensure privacy. Utilities are recommended to follow federal guidelines under the Federal Trade Commissions' Fair Information Practice Principles (FIPP), when determining aggregation policies as they cover the core principles of privacy protection in the US.[5]

- **Austin Energy**, **ComEd,** and **Puget Sound Energy**, use a threshold of three to five accounts for data aggregation and to-date have not received any complaints from account holders.[6] While there is no golden standard, aggregating in the range of three to five customer accounts or more without tenant authorization seems to ensure that personal customer usage information cannot be de-anonymized from monthly data points.

In the case where tenant authorization is needed, utilities should communicate the benefits of benchmarking to tenants and inform building owners of how to obtain tenant authorizations. Utilities can offer building owners means for providing tenant authorization: wet signature (signed, original document), electronic authorization, or tenant lease. While incorporating the clause in a tenant lease may be the most feasible method, in many cases building owners would need to complement this with an additional method for pre-existing tenants. This process gets more complicated when a corporation or the government owns a portfolio of buildings but utilities can play a crucial role in connecting with national headquarters to develop a solution.

- For multifamily buildings with 3 or less accounts, **Austin Energy** worked closely with the City of Austin to develop a [Release of Information Authorization form](#) that must be submitted from each tenant before whole-building data can be aggregated and released.

Support a ratepayer-funded mechanism for benchmarking as a part of an energy efficiency plan
More utilities are incorporating benchmarking into their energy efficiency strategy and adopting a rate-payer funding model versus charging customers on a one-off or subscription basis. Under this approach, the benefits of benchmarking (in terms of informing plans and improving outreach, not a stand-alone tool) are intended to reach ratepayers in the form of energy savings by leading customers to energy efficiency programs. Research suggests that access to aggregate data presents an opportunity for some building managers and local officials to assess multifamily

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[5] Institute for Market Transformation. 2012. *Energy Transparency in the Multifamily Housing Sector: Assessing Energy Benchmarking and Disclosure Policies*. Available at:
http://www.imt.org/uploads/resources/files/Energy_Trans_MFSector_IMT_Final.pdf
[6] Ibid.

energy performance for the first time. ACEEE recommends that benchmarking be used as an outreach tool for incentive and rebate programs.

- **ComEd** funds its benchmarking tool as a part of its energy efficiency plan. **Puget Sound Energy** originally funded its data access program through general funds but claims the next version of its system will be part of its energy efficiency portfolio.

Effective Strategies for treating benchmarking as a gateway to other energy efficiency programs:
An effective benchmarking tool will facilitate better energy management. When developing a data access program, a utility should simultaneously develop resources that lead customers to other energy efficiency programs. The automated data exchange feature into Portfolio Manager and the Fall 2014 release of the Multifamily ENERGY STAR score should help facilitate this process. While privacy constraints withstanding, utilities should explore what level of data they can technically and legally provide to building owners and tenants to better inform customers of possible energy efficiency improvements and potential cost-estimates.

Explore innovative methods for measuring the direct impact of benchmarking on energy savings[7]
Research shows that data access programs engage utility customers and drive them to other energy efficiency initiatives, suggesting that benchmarking can improve utilities ability to achieve energy efficiency goals and potentially offer more targeted, low cost programs. However, few studies can directly attribute benchmarking to verified energy savings.

- A 2012 report by the NMR Group for the California Public Utilities Commission found that utility-led benchmarking programs, which included Automated Benchmarking Services, and provided customer support for ABS services resulted in building owners undergoing comprehensive energy efficiency measures. Of participants who benchmarked:[8]
    - 62% reported that they took energy management actions
    - 84% reported planning or implementing energy efficiency improvements
    - 81% reported using benchmarking to identify utility efficiency programs, including incentives and rebates.

Incorporate benchmarking into incentive and rebate programs.

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[7] For more on benchmarking (when an ENERGY START Score is provided) and energy savings, see Data Trends: Benchmarking and Energy Savings.
[8] NMR Group. 2012. *Statewide Benchmarking Process Evaluation*. Submitted to California Public Utilities Commission. Available at:
http://www.calmac.org/publications/Statewide_Benchmarking_Process_Evaluation_Report_CPU0055.pdf.

Research shows that benchmarking helps evaluate and target energy efficiency programs and provide improved customer service. Utilities should use benchmarking data to better target incentive and rebate programs.

- Following recent benchmarking and disclosure in **NYC**, city officials received benchmarking data on nearly 900 million square feet of multifamily property and are now using this data to develop new energy efficiency policies and incentives and provide feedback on potential impacts of these efforts for the city's multifamily housing stock.

- **Efficiency Maine** provides quick and accurate voluntary whole-building benchmarking services to multifamily housing buildings with 5 or more apartment units per building. The benchmarking assessment provided by Efficiency Maine's Multifamily Efficiency Program is designed to help building owners and managers understand energy consumption and cost trends for each apartment building/complex, compare usage with similar buildings and identify opportunities and incentives/rebates and funding to assist with energy efficient upgrades.

Some utilities have incorporated benchmarking as a pre-requisite for incentive or rebate eligibility. With the advent of automated data exchange services and the generation of an ENERGY STAR multifamily score, the ability to target worst-performing buildings can be enhanced:

- In the commercial sector, **Baltimore Gas and Electric's (BGE) Retro-commissioning Program** requires applicants to benchmark their commercial building using either Portfolio Manager or an equivalent tool (e.g., EnergyScoreCard or WegoWise). If the project is accepted, BGE will provide incentives to cover up to 75% of the cost of the project, with a cap of $15,000. **Pepco's Retro-commissioning Program** operates similarly and requires customers to prepare and submit a report for review and approval before an incentive payment is made. In the case of Pepco, only those buildings with higher than average energy intensities are eligible for the incentive in the first place**.**

- **NSTAR** provides commercial building benchmark data and works with customers to properly upload it into Portfolio Manager. Once customers have benchmarked, NSTAR directs them toward appropriate existing incentive programs to implement recommended energy saving measures.

Use benchmarking to target worst-performing buildings.
Benchmarking can allow utilities and building owners with large portfolios to prioritize energy efficiency upgrade projects by targeting the worst-performing buildings. Research suggests the greatest predictor of achievable energy savings is high per-unit consumption intensity, suggesting that targeting the worst energy performers will maximize cost-effective energy savings investments.

- A 2012 baseline analysis of building benchmarking in NYC found that whole-building data provided by utilities is a highly cost-effective way to predict the different patterns of

energy use between buildings, and provides a sufficiently detailed baseline for building managers and owners to work towards energy efficient improvements.

- The Low Income Energy Affordability Network (LEAN) is a coordinated effort of seven utilities in Massachusetts to benchmark affordable housing throughout the state so that utilities can target energy efficiency incentives and rebates at the worst-performing buildings and maximize deep, comprehensive savings. In order to apply for low-income multifamily retrofits under the LEAN program, a building owner must create a WegoWise account to benchmark their building (WegoWise obtains energy usage data directly from utility and calculates usage metrics for comparison with similar buildings). LEAN provides the WegoWise tool at no-cost to building owners for 1-2 years in order to apply for the program. Based on energy usage, LEAN administrators will approve buildings for whole-building assessments and identify energy efficiency measures based on cost-effectiveness.

  In one case, LEAN program administrators chose a low-income building built in 1950 with 11 buildings and 355 apartments to apply retrofits. The Worcester Housing Authority, along with LEAN program administrators, chose to replace old boilers with new, high efficiency ones and to improve electric and heating efficiency simultaneously, opting to install a combined heating and power system (CHP). Data from the Housing Authority's WegoWise account shows a 71% decrease in electricity usage on the main electric meter when comparing December 2009 to December 2010 energy consumption data.[9]

  Below is a chart illustrating the benefits of LEAN's approach in targeting worst-performing buildings when applying energy efficiency measures. Benchmarking a large number of buildings and then targeting higher energy users has resulted in higher savings compared to potential savings from a first-come-first-serve approach typically used by program administrators.[10]

Fund True Opportunities

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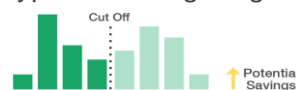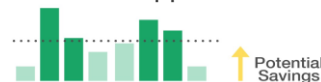
[9] LEAN's Low-Income Multifamily Retrofit Program Guide. Available at: http://leanmultifamily.org/sites/default/files/LIMF_Prog_Guide_11_8_2010.pdf

[10] Andrea Krukowski, Institute for Market Transformation 2014. Graphs presented at ACEEE's Multifamily Working Group Meeting, April 2.

- [NYSERDA's Multifamily Energy Performance Portfolio's Benchmarking Initiative](#) is aimed at encouraging building owners (affordable and market-rate buildings) to participate in a benchmarking assessment that will lead to highly targeted energy efficiency measures. After completion of the benchmarking process, owners receive a $500 incentive and are matched with a Performance Partner to conduct a whole-building assessment that looks for energy-saving potential. The assessment results in an Energy Reduction Plan that sets a performance target for the building and details specific recommendations and available NYSERDA incentives for which building owners are eligible. In order to qualify for incentives and rebates, building assessments must show the potential for at least a whole-building reduction of 15% in energy usage.

  Several case studies document the impact of NYSERDA's Multifamily Performance Program:[11]

  - **AC Lofts**: This 91-unit apartment complex located in historic Buffalo's adopted comprehensive energy efficiency upgrades including newly insulated walls and roofing, improved lighting and fixtures, motion sensors, water source heat pumps and energy-efficient appliances and motors. Since the initial assessment and renovation, the building has cut energy usage by an impressive 32 percent.

  - **Rose May Manor:** Once a building in despair, the building owner applied comprehensive energy efficiency upgrades through NYSERDA's Multifamily Performance Portfolio. Taking advantage of over $98,000 in incentives and financing for the balance, the owner made full-scale energy upgrades that slashed the building's energy usage by 39%. The build is now in high demand for tenants due to its low energy costs and high-quality of living – which, in turn, has generated a significant word-of-mouth effect among other building owners.

  - **Riverview Court**: NYSERDA's Multifamily Performance Portfolio determined that this 343-unit affordable housing building needed an across-the-board update. By replacing aging windows, lighting and refrigerators and making other upgrades such as air sealing and installing electricity submeters, Riverview Court cut its energy costs by more than $300,000 a year.

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[11] More case studies of NYSERDA's benchmarking initiative are available at: http://www.nyserda.ny.gov/Energy-Efficiency-and-Renewable-Programs/Multifamily-Performance-Program/Multifamily-Performance-Program/Existing-Buildings.aspx