## Public Sector Building Energy Benchmarking: Utility Data Access Options and Opportunities

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#### **About NEEP**

Founded in 1996, NEEP is a non-profit whose goal is to assist the Northeast and Mid-Atlantic region to reduce building sector energy consumption three percent per year and carbon emissions 40 percent by 2030 (relative to 2001). Our mission is to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities. We do this by fostering collaboration and innovation, developing tools, and disseminating knowledge to drive market transformation. We envision the region's homes, buildings, and communities transformed into efficient, affordable, low-carbon, resilient places to live, work, and play. To learn more about NEEP, visit our website at <a href="http://www.neep.org">http://www.neep.org</a>.

**Disclaimer:** NEEP verified the data used for this white paper to the best of our ability. This paper reflects the opinion and judgments of the NEEP staff and does not necessarily reflect those of NEEP Board members, NEEP Sponsors, or project participants and funders.

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## **NC OD** Executive Summary

Across the United States, an increasing number of building operators are engaging in building energy benchmarking, the practice of tracking the energy and water usage of existing buildings over time and comparing this data to previous measurements or modeled predictions for the building, or to the usage of similar buildings. The United States Environmental Protection Agency (U.S. EPA) estimates that over 40 percent of the commercial building stock has been benchmarked. This process is a widely accepted first step toward reducing building energy usage, yet navigating a sea of bills and invoices spanning multiple utilities and fuel sources can be a time consuming process not all building operators and facility managers are equipped to undertake. An assessment of the tools available and the policies and practices that promote building energy benchmarking reveals that efforts are underway to help streamline utility data access and encourage benchmarking for municipalities and other end users. Further, the prominence of public buildings within a community affords a unique opportunity for the public sector to lead by example and disseminate building energy conservation best practices – such as benchmarking – into the broader community.

This report surveys the current landscape of public sector building energy benchmarking policies and programs in the Northeast and Mid-Atlantic region. It examines the tools used to access utility data and how municipalities across the region are using them to track usage as part of building energy benchmarking mandates. The report then highlights municipalities that serve as exemplars for accessing and using data to guide energy management decisions. Finally, the report offers a series of observed best practices to help steer public entities and municipalities onto a path towards effectively implementing building energy benchmarking initiatives.

## The Public Sector as an Exemplar

The public sector is uniquely positioned to lead by example through the implementation of energy benchmarking initiatives. Recently, several states and municipalities have taken steps to mandate the benchmarking and disclosure of public building energy usage. Large public sector building portfolios present tremendous energy savings opportunities, and in many cases progress can be driven from the top down through existing administrative structures. Public sector benchmarking policies can be used to demonstrate the value of energy efficiency measures to taxpayers, and prioritize upgrades when faced with budgetary constraints. While the public sector presents a unique opportunity for benchmarking energy usage, it continues to face obstacles, many of which are similar to those experienced in the private sector. The benchmarking process can be time consuming and labor intensive, but tools exist to streamline this process in a way that makes it more accessible to underfunded and understaffed state and municipal governments.

## Tools Available for Streamlining Utility Data Access

The private sector offers options for municipalities seeking to understand their energy consumption patterns. Many utilities offer consolidated billing or electronic data interchange (EDI) options to deliver usage information to their customers in a manner that facilitates analysis. Third-party vendors also offer data collection and analysis services to states and large municipalities who choose to outsource their utility bill management and/or benchmarking efforts. The U.S. EPA offers a standardized tool for the

evaluation of energy data known as ENERGY STAR Portfolio Manager ("Portfolio Manager").<sup>1</sup> Portfolio Manager offers a Data Exchange option, allowing participating utilities and other third parties to import energy usage data directly into Portfolio Manager for analysis.

## **Observed Best Practices**

As the Northeast and Mid-Atlantic region looks for a path forward to efficiently access utility data in order to effectively implement building energy benchmarking mandates, several public sector benchmarking and data access best practices have begun to emerge. These practices include:

- Mandate state programs and incentivize municipal programs;
- Early stakeholder engagement;
- Leverage academic institutions as a resource;
- Institute cost recovery for Data Exchange Systems;
- Implement portfolio-wide Energy Management Systems (EMS) for states and large municipalities.

The section entitled "A Path to Public Sector Building Energy Benchmarking" presents a more robust discussion of these best practices.

#### **Role of Market Actors**

In addition to the observed best practices, there is a series of market actors who are essential in the push for streamlined access to utility data. These relevant parties are crucial to effectively proposing, establishing and implementing various elements of the observed best practices in order for utility data access to be streamlined for the public sector. These include:

- Public sector facility managers;
- Public sector officials;
- Academic and other non-governmental organizations;
- Regulators;
- Utilities.

The "Options for Streamlining Utility Data Access" section also presents a series of actions these market actors can take and the benefits associated with them which serve as the building blocks for the observed best practices.

<sup>&</sup>lt;sup>1</sup>ENERGY STAR Portfolio Manager is an online tool developed by the US Environmental Protection Agency that can be used to measure and track a building's energy and water consumption, as well as greenhouse gas emissions.

OPTIONS FOR STREAMLINING UTILITY DATA ACCESS			
Electronic Data Interchange (EDI)	<ul> <li>Format for electronic exchange of data between two parties.</li> <li>Protocols have evolved so that format is no longer standardized, but rather unique to each utility.</li> <li>Most utilities in restructured electric markets offer EDI.</li> </ul>		
Online Energy Data Dashboard	<ul> <li>Publicly accessible free online platform that aggregates data and provides information on utilities'</li> <li>Provides direct exchange of information between utilities, jurisdictions, and community members</li> <li>Creates transparency within the benchmarking process</li> </ul>		
EPA Portfolio Manager's Data Exchange Web Services	Advanced Programming Interface (API) that allows utilities and third party service providers to communicate energy data directly with the US EPA's Portfolio Manager.		
Third-Party Data Collection and/or Analysis Services (Not Utility Dependent)	States or large municipalities with the funding to do so can leverage assistance of a third party to collect, sort, check, and analyze building energy usage data.		
Green Button	<ul> <li>Standardized energy data format developed through an industry-led effort in response to a White House call to action, and supported by the National Institute of Standards &amp; Technology, the US Department of Energy, and others.</li> <li>Characterized as a literal "green button" on utility's website.</li> <li>Originally for residential applications, expanded to commercial.</li> <li>Green Button "Connect My Data" allows utility customers to send their data directly to a third party for processing and energy consumption analysis.</li> <li>Note: Green Button, although extremely innovative in years immediate following its production, has since been challenged greatly within the market and may no longer be considered a best practice.</li> </ul>		



#### **Recommended Actions for Streamlining Utility Data Access**

## **Building Energy Benchmarking**

Building energy benchmarking efforts are a driving force behind the evolution of utility data access options.<sup>2</sup> To understand the importance of streamlined utility data access in the context of building energy benchmarking, one must examine:

- 1. The building energy benchmarking process;
- 2. The benefits of building energy benchmarking;
- 3. The public sector's unique value proposition; and
- 4. The existing public sector building energy benchmarking efforts within the region.

#### The Building Energy Benchmarking Process

Streamlining utility data access can simplify the building energy benchmarking process by making it easier for building owners to access their energy usage data. Through traditional processes, data points must be collected from several different sources and organized in order to benchmark a building. This includes the collection of building square footage, occupancy, electric/gas/heating oil usage, and other fuel information (such as district steam or chilled water) from at least 12 full contiguous months (often requiring 13 months' worth of invoices).

This data is then organized and input or uploaded into a tracking software, the most utilized of which is the U.S. EPA's ENERGY STAR<sup>®</sup> Portfolio Manager ("Portfolio Manager").<sup>3</sup> Portfolio Manager is a freely available online software tool that normalizes energy data inputs according to weather records and user-input building usage information, and generates a statement of performance detailing a building's Energy Use Intensity (EUI).<sup>4</sup> Energy Use Intensity is the amount of energy used by a building per square foot each year, often expressed in kBtu/sf/yr. The EUI of a building can be used to compare it to other peer buildings, allowing a better understanding of relative overall building energy efficiency.<sup>5</sup>



Photo Credit: US EPA

For many common building types, Portfolio Manager also scores each uploaded building on a scale from 1-100, enabling building owners to compare their property to similar buildings nationwide. Those buildings achieving an ENERGY STAR score of 75 or higher are eligible for ENERGY STAR certification which demonstrates that a building has been verified by a licensed professional engineer or registered architect as performing among the top 25 percent of similar buildings nationwide. Studies show that ENERGY STAR certification provides value to building owners, as they achieve higher occupancy rates, rental prices, and sale prices per square foot than non-certified buildings.<sup>6</sup> In 2018 alone, more than 270,000 buildings, comprising 26 billion square feet of floor space

<sup>3</sup> United States Environmental Protection Agency's ENERGY STAR Portfolio Manager. Accessed: 4/28/15. Available at: <u>http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager</u>

<sup>&</sup>lt;sup>2</sup> It's important to note that building energy benchmarking is only a component of a broader push to benchmark energy usage, both inside and outside of the building envelope (e.g.- gasoline, diesel fuel, outdoor lighting).

<sup>&</sup>lt;sup>4</sup> In this context, the term "normalized" means adjusting energy usage data to account for higher or lower heating and cooling requirements based on an individual year's weather relative to a recent historical average, or how the building would have performed had external climactic conditions been the same.

<sup>&</sup>lt;sup>5</sup> United States Environmental Protection Agency's ENERGYSTAR.gov website. *What is Energy Use Intensity (EUI)*? Accessed: 7/30/19. Available at: <u>http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/understand-metrics/what-energy</u>

<sup>&</sup>lt;sup>6</sup> Miller, Norm (et. al). *Does Green Pay Off*? (July 2008). Accessed: 7/30/19. Available at: <u>http://www.usgbc.org/Docs/Archive/General/Docs5537.pdf</u>

have been tracked using Portfolio Manager. Not only do these certified buildings use an average of 35 percent less energy than typical buildings, studies find that they also command a premium of up to 16 percent for rental rates and sales prices.<sup>7</sup>

Campaigns and incentive programs throughout the Northeast and Mid-Atlantic expressly incorporate Portfolio Manager, including state-wide initiatives in New Jersey, New York, Delaware, Pennsylvania, and Connecticut.<sup>8</sup> Furthermore, building energy disclosure mandates in a number of jurisdictions in the region now require that buildings above certain size thresholds benchmark and report building energy use using Portfolio Manager. As of July, 2019, the following cities within the Northeast and Mid-Atlantic have adopted benchmarking policies: Boston, MA; Cambridge, MA; Portland, ME; South Portland, ME; New York, NY; Philadelphia, PA; Pittsburgh, PA; West Chester, PA; Washington, DC; Washington, D.C.; Rockville, MD; and Montgomery County, Maryland.<sup>9</sup>

## **Benefits of Building Energy Benchmarking**

Benchmarking a building's energy and water usage carries many benefits. Tracking energy usage is an essential first step toward reducing energy consumption and associated costs. This is important because buildings are responsible for approximately 40 percent of global energy usage and related emissions.<sup>10</sup> Benchmarking provides building owners and managers with the information they need to make informed decisions about building system optimization or efficiency investment. An EPA analysis of 35,000 buildings that were consistently benchmarked over a four year period found that energy savings averaged 2.4 percent per year.<sup>11</sup> Further, comparing a building's billed energy usage at varying points in time can help building owners detect clerical errors which may have resulted in higher than warranted energy bills.

## The Public Sector's Unique Value Proposition

Public sector buildings hold unique opportunities to accelerate benchmarking policies. Large public sector building portfolios present tremendous savings opportunities, and in many cases progress can be driven from the top down through existing administrative structures. Public sector benchmarking policies can be used to demonstrate the value of energy efficiency measures to tax payers and prioritize upgrades when faced with budgetary constraints. Such policies can also lead markets toward transformation by building capacity in preparation for broader commercial building energy benchmarking policies. Yet, public building energy benchmarking policies continue to face obstacles, many of which are similar to those experienced in the commercial sector.

#### Benchmarking in Portland, ME

The city of Portland, Maine benchmarks its public facilities on an annual basis. In November 2016, the city council enacted the <u>Energy Benchmarking Ordinance</u> which requires municipal buildings, residential buildings with 50+ dwellings, and commercial properties over 20,000 feet to report their annual energy and water consumption to the

 <sup>8</sup> United States Environmental Protection Agency's Energystar.gov. "Campaigns and Incentive Programs that Incorporate ENERGYSTAR." Accessed: 7/24/19. Available at: <u>http://www.energystar.gov/buildings/program-administrators/state-and-local-governments/campaigns</u>
 <sup>9</sup> Institute for Market Transformation (IMT). Building Energy Performance Policy. Accessed: 7/25/19. Available at: <u>http://www.imt.org/policy/building-energy-performance-policy</u>

<sup>&</sup>lt;sup>7</sup> United States Environmental Protection Agency's Energystar.gov. *"ENERGY STAR for Commercial Buildings Facts and Stats."* Accessed: 7/25/19. Available at: <u>https://www.energystar.gov/buildings/about-us/facts-and-stats</u>

<sup>&</sup>lt;sup>10</sup> United Nations Environmental Program (UNEP). *Buildings and Climate Change: Summary for Decision Makers*. (2009) Page 6. Accessed 7/24/19. Available at: <u>http://www.unep.org/sbci/pdfs/sbci-bccsummary.pdf</u>

<sup>&</sup>lt;sup>11</sup> Supra, at <u>note 9.</u>

Sustainability Office. The ordinance also requires that upon receiving this information, the Sustainability Office to disclose the data on the city website for the public to view<sup>12</sup>.

The information reveals seasonal variations in building use or performance and helps identify strategic opportunities for investment. Often, results lead to a review of a building's operations or long-term energy performance. For example, periodic benchmarking has revealed opportunities for switching fuels in the summer or changing operating procedures (operating hours, personnel policies, etc.) to save money.

Portland also uses benchmarking to target specific buildings for capital improvements based on potential performance opportunities such as oil to natural-gas boiler conversions that reduce costly fuel oil usage. Benchmarking data also provides the city confidence in estimating future utility costs, and can help identify efficiency rebate opportunities.

## Large Portfolios

The value of building energy benchmarking is especially evident in the public sector, where state agencies and municipalities often oversee large portfolios using substantial amounts of energy. Benchmarking energy usage in public buildings provides agencies, officials, and facilities managers with a better understanding of building operational costs than was previously available. This enables the more efficient allocation of taxpayer dollars towards strategic energy improvements which can provide a lifecycle return that surpasses other investment vehicles.

#### **Top-Down Opportunities**

The hierarchical nature of public sector administration provides a unique value-add in the context of building energy benchmarking. At the state and municipal levels, elected officials can drive policy from the top down in several ways. For example, they can direct facility managers to benchmark energy usage and institutionalize processes preserving such a mandate.

Outside their own portfolio, elected officials can also influence private actors and industries. State-owned buildings in aggregate are often one of the single largest energy consumers in a state.<sup>13</sup> This position of leverage allows the public sector to influence the decision makers in the energy field. For example, the Commonwealth of Massachusetts partnered with utilities, a software developer, and municipalities in order to make energy usage data available to municipal officials for benchmarking purposes.<sup>14</sup>

#### Leading by Example

The public sector is uniquely positioned to lead by example through the implementation of energy benchmarking initiatives. Recently, several states and municipalities have taken steps to mandate the benchmarking and disclosure of public building energy usage (See the following section entitled "State Legislation or Municipal Ordinances"). If the private sector follows public sector leadership toward benchmarking and disclosure policies: (a) higher performing buildings or rental spaces become more attractive

<sup>&</sup>lt;sup>12</sup> Portland Maine's portlandmaine.gov. *"Energy Benchmarking Ordinance."* Accessed: 7/25/19. Available at: <u>https://www.portlandmaine.gov/2389/Energy-Benchmarking.</u>

<sup>&</sup>lt;sup>13</sup> Metropolitan Bay Transportation Authority. *About Sustainability*. (Stating that the "MBTA is the largest single consumer of electricity in the Commonwealth of Massachusetts.") Accessed: 4/28/15. Available at:

http://www.mbta.com/about\_the\_mbta/environment/default.asp?id=26014

<sup>&</sup>lt;sup>14</sup> The result of this partnership was the Mass Energy Insight Platform, which is discussed in the "Exemplary Statewide Energy Data Tracking and Analysis Efforts within the Region" section.

in the marketplace due to the visibility of their comparatively low operating costs; and (b) low-performing buildings would consider efficiency upgrades to remain competitive in an open marketplace. This creates a market mechanism to encourage energy efficiency by leveraging public sector leadership.

## **Better Buildings Initiative**

The Better Buildings Initiative, launched by President Obama in 2011, is a broad, multi-strategy effort to improve the energy use of our nation's commercial, industrial, residential, and public buildings by 20 percent over 10 years. Better Buildings harnesses public and private sector leadership, state and local policies, financing mechanisms, workforce development, and efforts to improve building energy information to meet that ambitious goal. Hundreds of organizations are currently partnering with the Energy Department and furthering four key strategic areas to accelerate investments in energy efficiency:

- -Developing innovative replicable solutions with market leaders,
- -Developing a skilled clean energy workforce,
- -Making energy efficiency investment easier, and
- -Leading by example in the federal government.<sup>15</sup>

One of the many vehicles for sharing best practices is the annual Better Buildings Summit for partners which began in 2012. This is a conference that allows for direct collaboration between organizations to promote and further their individual energy goals as well as the energy goals of the nation as a whole.

#### **Better Buildings Challenge**

The Better Buildings Challenge is a voluntary leadership initiative that asks leading CEOs and executives of U.S. commercial and manufacturing companies, universities, school districts, multifamily residential organizations, data centers, and state and local governments to make a public commitment to energy efficiency. Organizations that step up to the challenge publicly pledge to improve the energy intensity of their entire U.S. portfolio by at least 20 percent by 2020 or within 10 years announce, initiate, and complete at least one showcase project and one implementation model<sup>16</sup>. As the program has grown, the number of participating partners within the Northeast and Mid-Atlantic has rapidly increased. For a full list of partners see: <u>Better Buildings Initative:</u> <u>Partners.<sup>17</sup></u>

#### **Public Sector Barriers**

While the public sector presents a unique opportunity for benchmarking energy usage, it also faces sizable barriers. Like the private sector, public sector entities often find themselves resource constrained. Further, states agencies and municipal governments must navigate a sea of bills and invoices spanning multiple utilities, fuel sources, outside records, and internal administrative structures before they can examine their full portfolio

<sup>&</sup>lt;sup>15</sup> US Department of Energy. About the Better Buildings Initiative. Accessed 9/22/2016.

https://betterbuildingssolutioncenter.energy.gov/about-better-buildings-initiative

<sup>&</sup>lt;sup>16</sup> US Department of Energy. *Better Buildings Challenge Progress Update*. (Spring 2016) Available at:

https://betterbuildingssolutioncenter.energy.gov/sites/default/files/news/attachments/2016%20Better%20Buildings%20Progress%20Update.pdf <sup>17</sup> US Department of Energy. *Better Buildings Initiative: Partners A-Z.* Accessed 7/26/19. Available at:

https://betterbuildingssolutioncenter.energy.gov/partner-list-a-z

of energy usage data in a manner that facilitates analysis.<sup>18</sup> In some cases, facility inventories are outdated or inaccurate, often with improperly assigned meters. In others, a non-utility party is responsible for recording an asset's energy usage information.<sup>19</sup> In states where restructured electric markets have enabled competitive supply contracts, the utility may not have immediate access to the supplier charge on their bill. Conquering these obstacles, several states and municipalities throughout the region mandate or incentivize public building energy benchmarking.

## Public Sector Benchmarking Efforts within the Region

States and municipalities have taken several different approaches to enact public building benchmarking policies.<sup>20</sup> These approaches include policies that are:

- 1. Mandated through legislation/ordinances;
- 2. Directed through an executive order; or

3. Voluntarily undertaken as part of a grant, initiative, programmatic commitment, or facility management best practice.

#### **Legislation Pathways**

Passing legislation regarding benchmarking can be completed through three main pathways: executive orders, state legislation, or municipal ordinances. An executive order is a declaration by the executive of a governing body that directs agencies under their authority to comply with a suggested action or policy. Conditioned upon the trustee model of representation, executive orders can be put in place by a proactive governor without the need for legislative action.<sup>21</sup> Within the NEEP region, the following three states, in addition to more, have had governors issue executive orders requiring state building energy benchmarking: (1) Massachusetts;<sup>22</sup> (2) Delaware;<sup>23</sup> and (3) New York.<sup>24</sup> The downside to executive orders is that they can be a temporary fix because they can be easily overturned by a newly elected governor who does not align with the same environmental progressivity. Policies enacted through state legislation or municipal ordinance, however, can be highly effective. The successful passing and enactment of a law requires political capital and support amongst a broad group of stakeholders, which requires significantly more effort than an executive order, but they have been proven to work. Many jurisdictions throughout the region have seen success enacting ordinances that require public building energy benchmarking, often as the first step of a broader benchmarking and disclosure initiative

<sup>&</sup>lt;sup>18</sup> Herrick, Lori (et.al.) US Department of Energy's Better Buildings Conference, *Best Practices in Streamlining Access to Energy Data*. (Stating that the City of Virginia Beach, VA (Pop. ~448,000) eliminated 12,000 paper invoices annually by switching to electronic data interchange from paper billing for energy usage data. Accessed: 4/28/15. Available at:

http://www1.eere.energy.gov/buildings/betterbuildings/summit/documents/presentations/public/best-practices-in-streamlining-access-to-energydata.pdf

<sup>&</sup>lt;sup>19</sup> For example, a facility manager might record gallons of heating oil delivered or a fleet driver may be responsible for recording gallons of gasoline pumped.

<sup>&</sup>lt;sup>20</sup> See Generally, NEEP's *Building Energy Benchmarking and Disclosure Policies in the Northeast and Mid-Atlantic*. Available at: <u>http://www.neep.org/building-energy-rating-and-disclosure-policies</u>

<sup>&</sup>lt;sup>21</sup> The trustee model of representation is based upon the idea that elected officials should be allowed the autonomy to act in favor of the public good, with less consideration for the interests of specific constituencies.

<sup>&</sup>lt;sup>22</sup> Massachusetts Governor Deval L. Patrick, Executive Order 484 (April 2009) Page 11. Accessed: 7/29/19. Available at: http://www.mass.gov/anf/docs/dcam/dlforms/energy/energy-eo484-final.pdf

<sup>&</sup>lt;sup>23</sup> Delaware Governor Jack Markell, Executive Order 18 (February 2010) Accessed: 7/29/19. Available at:

http://governor.delaware.gov/orders/exec\_order\_18.shtml. See also, Delaware Division of Facilities Management Website. Benchmarking and Tracking. Accessed: 4/28/15. Available at: http://dfm.delaware.gov/enrgenv/bnchmrk.shtml

<sup>&</sup>lt;sup>24</sup> New York Governor Andrew Cuomo, Executive Order 88 (2012) Accessed: 7/29/19. Available at: <u>http://www.dec.ny.gov/energy/71363.html</u>

that reaches commercial and multi-family buildings as well.<sup>25</sup> The following table highlights city, county, and state-level benchmarking policies within the Northeast and Mid-Atlantic:

## **Statewide Benchmarking Policies**

State	Buildings Incorporated	Required Actions	Policy (Year Enacted)
Connecticut	All state owned and leased buildings	Utilities must provide buildings with aggregated whole-building energy usage data; Buildings must reduce energy use by at least 10 percent by 2013 and by another 10 percent by 2018	<u>Senate Bill 1243 (2011)</u>
Delaware	All state owned and leased buildings	The Office of Management and Budget and the Department of Natural Resources and Environmental Control must establish a plan to track and report annual energy use of buildings; Buildings were required to reduce energy use by at least 20 percent by 2013 (baseline 2008)	Executive Order 18 (2010)
New Jersey	All commercial buildings more than 25,000 square feet	Buildings must track and report their annual energy and water use	<u>Assembly Bill A3723</u> (2018)
New York	All state owned and managed buildings	Buildings must track and report their annual energy use, buildings required to reduce energy use by 20 percent by 2015 (baseline at 2000) and by another 20 percent by 2023, state agencies must incorporate energy efficient design aspects into all applicable construction and renovation	Executive Order 88 (2012)

## Jurisdiction Enacted Benchmarking Policies

Jurisdiction	Buildings Incorporated	Required Actions	Policy (Year Enacted)
Boston, MA	All city-owned buildings; Commercial buildings more than 35,000 square feet; Residential buildings over 35,000 square feet or with 35 or more units; Any parcel with multiple buildings that sum to	Buildings must report their annual energy and water use to the city of Boston; The city is required to make this information public through reports and various analytics	<u>Building Energy Reporting and</u> <u>Disclosure Ordinance (2013)</u>

<sup>25</sup> See <u>www.BuildingRating.org</u> for updates on the latest jurisdictions to embrace building rating.

	100,000 square feet or more, or have 100 units or more.		
Cambridge, MA	All city owned buildings; Nonresidential buildings more than 25,000 square feet	Buildings must track and report their annual energy use; Benchmarking data will be publicly disclosed via an online database	Building Energy Use and Disclosure (2014)
Montgomery County, MD	Privately owned nonresidential buildings more than 50,000 square feet; All county owned nonresidential buildings	Buildings must track and report their annual energy use; Benchmarking data will be publicly disclosed via an online database; Buildings must have Recognized Data Verifier verify their data every three years	Building Energy Benchmarking (2014, Updated 2017)
New York City, NY	City owned buildings more than 10,000 square feet	Buildings must track and report their annual energy use; Beginning in 2018 private buildings more than 25,000 square feet will be required to comply with the benchmarking requirement; Benchmarking data will be publicly disclosed for applicable buildings	NYC Benchmarking Law (2009)
Philadelphia, PA	Commercial buildings more than 50,000 square feet	Buildings must track and report their annual energy and water use; The seller or lessor of an eligible building must, upon request, provide prospective purchasers or lessees with a copy of the building's most recent Statement of Energy Performance; Benchmarking data will be publicly disclosed via an online database.	Building Energy Benchmarking (2012)
Pittsburg, PA	Commercial buildings more than 50,000 square feet	Buildings must track and report their annual energy and water use	Building Energy Benchmarking Ordinance (2016)
Portland, ME	Municipal and nonresidential buildings between 20,000 and 50,000 square feet	Buildings must track and report their annual energy use	Building Energy Use Benchmarking Ordinance (2016)
Rockville, MD	Privately owned nonresidential buildings more than 50,000 square feet	Buildings must track and report their annual energy use; Buildings must have a Recognized Data Verifier verify their data every three years; Benchmarking will be publicly disclosed for city buildings	<u>Ordinance 09-16 (2016)</u>

South Portland, ME	Municipal, school, and commercials buildings more than 5,000 square feet	Buildings must track and report their annual energy use; Benchmarking data will be publicly disclosed; Buildings must complete a five-year comprehensive energy audit by 2023	Energy and Water Benchmarking Ordinance (2017)
West Chester, PA	New construction commercial buildings	Buildings must achieve "Designed to Earn the Energy Star" recognition as determined by the Energy Star Target Finder Tool; Buildings must track and report annual energy use	Energy Star Ordinance for Private Commercial Construction (2008)

## **New York**

New York's Executive Order 88 is a state-wide ordinance that applies to all state owned and managed buildings, and requires annual energy used to be tracked and reported. The aspect of this policy that sets it apart from other benchmarking requirements is that not only do buildings have to report to the state, they also have energy usage reduction requirements. The original requirements, set in 2012, were a 20 percent reduction in energy usage by 2015 and reduction by another 20 percent by 2023.<sup>26</sup> Since its establishment, the first of these energy reduction goals has been reached by state buildings, and the state is predicted to exceed their 2023 goal.<sup>27</sup> This executive order can be considered a best practice because it not only facilitates the collection of energy usage data, it also requires energy use reduction which leads to the incorporation of energy efficient design aspects into all applicable construction and renovation. Establishing aggressive goals for reducing energy consumption in state-owned buildings, Executive Order 88 is the centerpiece of a broader program known as BuildSmartNY.

BuildsmartNY aims to reduce energy usage by 20 percent in the state's 16,000+ buildings by the year 2020.<sup>28</sup> To accomplish this goal, the order requires benchmarking of all buildings with an area greater than 20,000 square feet. Low-achieving buildings must then undergo an ASHRAE Level II audit, which requires detailed on-site equipment analysis, to identify opportunities for improvement, as well as opportunities for cost-effective on site renewable generation. The New York Power Authority (NYPA) is tasked with administering the order through a Central Management and Implementation Team (CMIT). CMIT will use Portfolio Manager, but will seek to leverage additional benchmarking systems as they become available.<sup>29</sup>

New York's executive order is unique because it mandates installation of *sub-meters* at all buildings larger than 100,000 square feet. Currently, more than 90 percent of data for facility square footage is available only at the master metered level.<sup>30</sup> The anticipated sub-meter data is fed directly into the New York Power Authority's (NYPA) NYEnergyManager network operations center for analysis. With the help of NYEnergyManager located at SUNY Polytechnic Institute (Albany, NY), the interval meter and sub-meter data is used to paint a detailed picture of building energy savings opportunities, allowing identification of operational savings and demand

https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/EO88\_0.pdf.

- <sup>27</sup> Better Buildings Initiative. *BuildSmartNY Executive Order 88*. Accessed: 7/30/19. Available at:
- https://betterbuildingsinitiative.energy.gov/implementation-models/buildsmart-ny-executive-order-88.

<sup>&</sup>lt;sup>26</sup> New York State. *Executive Order 88.* Accessed: 7/30/19. Available at:

<sup>&</sup>lt;sup>28</sup> BuildSmartNY. Baseline Energy Performance of New York State Government Buildings. (August 2013) Page 2. Accessed: 4/28/15. Available at: <u>http://www.nypa.gov/BuildSmartNY/BaselineEnergyReport08-2013.pdf</u>

 <sup>&</sup>lt;sup>29</sup> BuildSmartNY. Executive Order 88 Guidelines. Page 9. Accessed: 4/28/15. Available at: <a href="http://www.nypa.gov/BuildSmartNY/Guidelines.pdf">http://www.nypa.gov/BuildSmartNY/Guidelines.pdf</a>
 <sup>30</sup> BuildSmartNY. 2013 Annual Progress Report. Page 40. (January 2014) Accessed: 4/28/15. Available at:

http://www.nypa.gov/BuildSmartNY/BuildSmartNY-2013-Annual-Progress-Report.pdf

response opportunities (et.al.)<sup>31</sup> It is estimated that the NYEnergyManager program will save approximately \$25 million each year, or five percent of the state's \$500 million energy bill.<sup>32</sup>

## West Chester, Pennsylvania

West Chester's Energy Star Ordinance, which was first established in 2008, is different from many other jurisdiction's current policies. Unlike other policies, which target buildings that already exist, West Chester's ordinance targets buildings that are in construction or have not been erected yet. Under their ordinance, buildings must be designed to earn the ENERGY STAR certification as per determined by the Energy Star Target Finder Tool.<sup>33</sup> Rather than requiring less-energy efficient buildings to track their energy and water usage, this ordinance targets energy efficiency at the root of the problem: making homes energy efficient from the outset. Through tight construction and duct systems, properly installed insulation, high performance windows, efficient heating and cooling equipment, and ENERGY STAR certified lighting and appliances, buildings can earn their "Designed to Earn the ENERGY STAR" certification. ENERGY STAR certified homes and apartments are at least 10 percent more energy efficient than homes built to code and achieve a 20 percent improvement on average, while providing owners and residents with better quality, performance, and comfort.<sup>34</sup>

#### Initiatives

Aside from legislation, ordinances, or executive orders, some jurisdictions benchmark their public buildings simply because it is cost-effective facility management and saves taxpayer dollars. A non-exhaustive selection of known public sector benchmarking initiatives is listed below:

- Public schools across Vermont have been benchmarked through the School Energy Management Program, which began in 1993.<sup>35</sup>
- The Vermont Department of Buildings and General Services has benchmarked many state-owned public buildings.<sup>36</sup>
- New Hampshire received funding under the American Recovery and Reinvestment Act to benchmark and address energy efficiency in many of its public schools.<sup>37</sup>
- Rhode Island received a grant from the US DOE to benchmark its state and municipal facilities under the Rhode Island Public Energy Partnership.<sup>38</sup> A key stakeholder in Rhode Island's benchmarking efforts is the University of

http://www.vtvsa.org/school-energy-management-program.php

<sup>&</sup>lt;sup>31</sup> Press Release: Governor Cuomo Announces State's First Energy Management Network Operations Center to Improve Energy Efficiency in Public Facilities. (October 2014) Accessed: 4/28/15. Available at: <u>http://www.governor.ny.gov/news/governor-cuomo-announces-states-firstenergy-management-network-operations-center-improve</u>

 <sup>&</sup>lt;sup>32</sup> Kennedy, Kit. Natural Resources Defense Council Switchboard. New Operations Center to Help New York State Save Five Percent on Energy. (October 2014) Accessed 7/29/19. Available at: <u>http://switchboard.nrdc.org/blogs/kkennedy/new\_operations\_center\_to\_help.html</u>
 <sup>33</sup> Building Rating. West Chester, PA Energy Star Ordinance for Private Commercial Construction. Accessed: 7/29/29. Available at: <u>https://www.buildingrating.org/policy/west-chester-pa-energy-star-ordinance-private-commercial-construction</u>

<sup>&</sup>lt;sup>34</sup> United States Environmental Protection Agency's ENERGYSTAR.gov. *Designed to Earn for Multifamily*. Accessed: 7/29/19. Available at: https://www.energystar.gov/partner\_resources/residential\_new/working/other\_participants/designed\_earn\_multifamily

<sup>&</sup>lt;sup>35</sup> Vermont Superintendents Association. *School Energy Management Program*. Accessed: 7/29/19. Available at:

<sup>&</sup>lt;sup>36</sup> Fourth Biennial Report of the Climate Neutral Working Group. (March 2011) Page 8. (Stating that "Benchmarking and/or recommendations for specific performance upgrades have been completed on all District Courthouses, Correctional Facilities, Capital Complex and Waterbury State Office Complex." Accessed: 4/28/15. Available at:

http://www.anr.state.vt.us/anr/climatechange/Pubs/CNWG4thBiennialReport FINAL 3-18-11.pdf

<sup>&</sup>lt;sup>37</sup> New Hampshire EnergySmart Schools Program. (Stating that the "Program is currently closed and no longer accepting data") Accessed: 4/28/15. Available at: <a href="http://www.nhschoolbenchmarking.com/">http://www.nhschoolbenchmarking.com/</a>

<sup>&</sup>lt;sup>38</sup> See Generally, Rhode Island Officer of Energy Resources. *Rhode Island Public Energy Partnerships*. Accessed: 4/28/15. Available at: http://www.neep.org/sites/default/files/resources/RIPEP%20Municipal%20Flyer.pdf

Rhode Island, which utilizes "Energy Fellows" to coordinate and facilitate benchmarking efforts in Rhode Island municipalities.

In addition to jurisdiction initiatives as a way to cut costs, research projects led by states to investigate energy saving opportunities, provide best practices, or introduce new technology can be a vehicle for communities to become more energy efficient without passing true legislation. For example, the Commonwealth of Massachusetts' Enterprise Energy Management System (EEMS) development project was a way to better understand energy savings opportunities within the state's largest buildings. The Commonwealth contracted for the installation of 1,300 real time meters in 470 buildings.<sup>39</sup> Data provided by these meters was monitored through third party service provider EnerNOC's energy intelligence software platform to identify energy savings opportunities as a part of a \$9.7 million contract. The program has been able to identify over \$2.2 million worth of annual operational savings alone in state buildings.<sup>40</sup> Using EEMS, town planners and building owners can use the information to determine which buildings have the worst efficiency and prioritize those buildings to maximize efforts. Using EEMS, UMASS Lowell was able to identify operational alterations to their building management systems that will save \$45,000.<sup>41</sup>

Upon the project's completion, it was concluded through data analysis that the buildings in Massachusetts all have a higher than average energy consumption and costs when compared to similar building types and sizes for the New England region. The biggest energy user was found to be electricity, which accounts for more than half of the building stock energy usage, in addition to a significant amount of energy consumed for space heating. With this information, the project team concluded that the largest potential savings would involve reduction in the amount of energy required to heat buildings, however, individual building energy audits would provide more personalized information.<sup>42</sup> The audits would also yield information on the water and electricity performance of each building and where there might be opportunities for savings. The final project findings and deliverables can be found on Boston's EEMS Update<sup>43</sup>

## **Utility Data Access**

Building energy benchmarking can be a time-consuming and labor intensive process, especially in the public sector.<sup>44</sup> Yet, tools exist to streamline these processes in a way that makes them more accessible to underfunded and understaffed state and municipal governments. To understand how to improve access to utility data, one must examine: (1) traditional methods of accessing utility data: and (2) options for streamlining utility data access.

<sup>41</sup> Massachusetts' mass.gov. *Leading by Example: Towards Our Targets*. Accessed: 7/29/19. Available at: <u>https://www.mass.gov/files/documents/2017/09/05/lbe-eo484-report.pdf</u>

<sup>&</sup>lt;sup>39</sup> McCarey, Maggie (et.al) Massachusetts Department of Energy Resources. *Massachusetts Enterprise Energy Management System*. (February 2014). Accessed: 7/30/19. Available at: <u>http://energyoutlook.naseo.org/Data/Sites/3/presentations/McCarey-Rao.pdf</u> <sup>40</sup> *id*.

<sup>&</sup>lt;sup>42</sup> City of Boston Official Website. *Energy Consumption Assessment, City of Boston 50 Buildings Report*. Accessed: 7/29/19. Available at: <u>https://www.cityofboston.gov/images\_documents/EEMS%20Energy%20Consumption%20Assessment%20Report%20Final\_tcm3-</u> <u>33503.pdf</u>.

<sup>&</sup>lt;sup>43</sup> The City of Boston Official Web Site. *Enterprise Energy Management System (EEMS) Strategic Assessment*. Accessed: 7/29/19. Available at: <u>https://www.cityofboston.gov/environment/EEMS.asp</u>.

<sup>&</sup>lt;sup>44</sup> See the sub-section titled "Public Sector Barriers"

## Traditional Methods of Accessing Utility Data

Customers traditionally have access to most of their building energy usage data through line items that are available on a monthly paper bill.<sup>45</sup> While some utilities have moved to a web-based paperless model, this model is often based upon meter number or service address rather than aggregated on a per-customer basis. This means that a customer with multiple facilities in a single service area may need to enter a specific login for each facility.

Alternatively, consolidated billing is an option offered by some utilities meant to help users with multiple accounts easily access their information in an organized manner.<sup>46</sup> Yet, even in cases where a utility offers consolidated billing, users must still manually transfer data into benchmarking software. Although straightforward, the process is time-consuming and laden with potential for manual input errors.

## **Options for Streamlining Utility Data Access**

Several options are available for streamlining utility data access,<sup>47</sup> many of which are depicted in the table below. With the exception of third party services, the following options are only available to a customer whose utility has chosen to offer such services.

Options for Streamlining Utility Data Access <sup>48,49</sup>			
Electronic Data Interchange	<ul> <li>Standardized format for electronic exchange of data between two parties</li> <li>Evolved so that format is unique to each utility</li> </ul>		
EPA's Portfolio Manager Data Exchange Web Services	• Application Programming Interface (API) that allows utilities and third-party service providers to communicate energy data directly with the US EPA's Portfolio Manager.		
Online Energy Data Dashboard	<ul> <li>Publicly accessible free online platform that aggregates data and provides information on utilities'</li> <li>Reliable way to exchange data directly with community members</li> </ul>		
Third-Party Data Collection and/or Analysis Services	• State, municipality, or other building owner leverages assistance of third party to collect, sort, check, and analyze building energy usage data.		

<sup>&</sup>lt;sup>45</sup> Availability of recorded data for intermittent unregulated fuels (e.g. diesel for a generator) may be more limited.

<sup>&</sup>lt;sup>46</sup> United States Environmental Protection Agency. *Utility Best Practice Guidance for Providing Business Customers with Energy Use and Cost Data*. Section 2-11. (November 2008) Accessed: 4/28/15. Available at: <a href="http://www.epa.gov/cleanenergy/documents/suca/utility\_data\_guidance.pdf">http://www.epa.gov/cleanenergy/documents/suca/utility\_data\_guidance.pdf</a>.

<sup>&</sup>lt;sup>47</sup> State and Local Solution Center (forthcoming). Energy Data Collection and Tracking in the Public Sector: Best Practices for Establishing a Robust and Sustainable Energy Data Management Program. U.S. Department of Energy, Weatherization and Intergovernmental Program Office.

<sup>&</sup>lt;sup>48</sup> State and Local Solution Center (forthcoming). Energy Data Collection and Tracking in the Public Sector: Best Practices for Establishing a Robust and Sustainable Energy Data Management Program. U.S. Department of Energy, Weatherization and Intergovernmental Program Office.

<sup>&</sup>lt;sup>49</sup> For a chart summarizing principal advantages and disadvantages of each utility data access method, see: Minnesota Department of Commerce: Division of Energy Resources. *Integrating Benchmarking into Utility Conservation Improvement Programs to Capture Greater Energy Savings*. (August 2014) Pages 31-32. Accessed: 4/28/15. Available at: <a href="https://mn.gov/commerce/energy/images/55323-71145-Weidt2014Benchmarking.pdf">https://mn.gov/commerce/energy/images/55323-71145-Weidt2014Benchmarking.pdf</a>

## Electronic Data Interchange

A number of utilities in the Northeast and Mid-Atlantic have developed Electronic Data Interchange (EDI) capabilities.<sup>50</sup> EDI is a standardized format for the "electronic exchange of information between two entities using standard, machine [readable], structured data formats."<sup>51</sup> The EDI data format is not limited to the realm of utility data access, and is instead a standard for many types of electronic bulk data transfers, including communications between utilities and retail electric suppliers in restructured markets. EDI is an important option because it contains all information from the utility invoice and allows third party firms to accept utility data in a standardized electronic format for processing and analysis on behalf of their customers.<sup>52</sup> Though, some observers note that EDI has now evolved to the point where its format has become individualized according to each utility, rather than standardized.<sup>53</sup>

The main limitation of the EDI format is that the data sent by a utility cannot be directly uploaded into Portfolio Manager by the recipient, and instead requires quality control and input through use of a third party software provider; costs of such a service to municipalities with 100 accounts or more is minimal.<sup>54</sup> Also, once a municipality chooses to receive its billing data via EDI, it may no longer receive paper bills from the utility.<sup>55</sup> Some municipalities requiring a paper bill for their records, may format the data as such and produce a hard copy of their own.

## **Online Energy Data Platform**

Online Energy Dashboards are an up and coming aspect of state and local energy efficiency programs. These dashboards are free online platforms with public access to a community's aggregated energy and benchmarking data. Energy data dashboards visualize the progress states make towards their large greenhouse gas emission reduction goals by relating benchmarking data directly to these initiatives. It is not only empowering for community members to see positive progress towards big picture goals, but it is also a great way to track the city or state's development in reaching these goals. Tracking progress gives communities the foresight they need in order to adjust policies in a way that allows them to keep up with their goals. In addition, energy data platforms create transparency in the benchmarking process, allowing the general public to track energy usage

http://www.nyseg.com/MediaLibrary/2/5/Content%20Management/NYSEG/SuppliersPartners/PDFs%20and%20Docs/EDIOverview.pdf 52 State and Local Solution Center. (forthcoming). *Energy Data Collection and Tracking in the Public Sector: Best Practices for Establishing a Robust and Sustainable Energy Data Management Program*. U.S. Department of Energy, Weatherization and Intergovernmental Program Office.

<sup>&</sup>lt;sup>50</sup> As of November 2014, Investor-Owned Utilities in the Northeast and Mid-Atlantic Offering EDI include: Allegheny Power and Gas; Baltimore Gas and Electric; Central Maine Power; Delmarva Power; Elkton Gas; Elizabethtown Gas; First Energy; Green Mountain Power; Jersey Central Power and Light,; Met-Ed; Eversource; NYSEG; Penn Power; Pennsylvania Power and Light; PENELEC; PECO; Potomac Edison; Potomac Electric Power Co; PPL Utilities; Public Service Electric and Gas Corporation; Washington Gas; and West Penn Power (For references, see: <u>http://utilityaccounting.com/services-current</u>, <u>VT PSB EDI Standards</u>, and <u>Central Maine Power EDI Standards</u>)
<sup>51</sup> See Generally, New York Public Service Commission, Report of the New York EDI Collaborative, *Overview of EDI*. (June 1999) Page 2. Accessed: 4/28/15. Available at:

<sup>&</sup>lt;sup>53</sup> Supra, at note 48. Page 6.

<sup>&</sup>lt;sup>54</sup> State and Local Solution Center. (forthcoming). *Energy Data Collection and Tracking in the Public Sector: Best Practices for Establishing a Robust and Sustainable Energy Data Management Program*. U.S. Department of Energy, Weatherization and Intergovernmental Program Office.

<sup>55</sup> Ibid.

and hold their governing body accountable for progress towards energy usage reduction goals. Various states within the Northeast and Mid-Atlantic have been realizing the power and benefits to online energy dashboards and working them in to their energy efficiency plans. In the summer of 2019 alone, New York State Energy Research and Development Authority (NYSERDA) launched New York's new <u>Clean Energy Dashboard</u><sup>56</sup> and New Hampshire passed a bill (<u>SB284</u><sup>57</sup>) into law establishing a statewide, multi-use online energy data platform.

## **New York**

New York recently launched its new Clean Energy Dashboard with the hopes that it will be an effective way to track progress towards current state energy efficiency goals. The dashboard aggregates data reaching back to 2016 and provides information on utilities and NYSERDA's programs. The data is mainly focused on current/active program portfolios, and is not fully complete or representative of NY's energy efficiency progress, but there are still a number of benefits to the platform.<sup>58</sup> Since users are able to interact with the display and have the option to customize the dashboard based on the information they want to view, it makes the display very dynamic compared to simply presenting information. Benefits associated with other program portfolios, and other program administrators, will be added to the Clean Energy Dashboard over time, especially where pertinent to assessing progress toward the current State energy efficiency goal. The following figure depicts a screenshot of the Clean Energy Dashboard, which outlines the progress of carbon dioxide emissions reductions (in metric tons) by quarter.

 <sup>&</sup>lt;sup>56</sup> New York State Official Page. *Clean Energy Dashboard*. Accessed: 7/26/19. Available at: <u>https://rev.ny.gov/cleanenergydashboard</u>
 <sup>57</sup> General Court of New Hampshire – Bill Status System. *Bill SB284*. Accessed 7/26/19. Available at: <u>http://gencourt.state.nh.us/bill\_status/bill\_status.aspx?lsr=1025&sy=2019&sortoption=&txtsessionyear=2019&txtbillnumber=SB284</u>.

<sup>&</sup>lt;sup>58</sup> New York State Official Page. *Clean Energy Dashboard*. Accessed: 7/30/19. Available at: <u>https://rev.ny.gov/cleanenergydashboard</u>



## Commercial Industrial Multifamily Multisector Residential Transportation

As represented through the legend, the differently colored sectors of the bars signify the various high carbon dioxide emitting aspects of the community. By examining the graph, it is very apparent that since 2016, New York has seen huge progress in both the commercial and industrial building sectors, however, there is still a lot of room for growth in the residential sector. Through aggregation of data in this way, the state can make observations like this and use them to make changes and further their energy efficiency goals.

## Maryland Department of General Services Website

The Maryland Department of General Services (DGS) publishes its benchmarking data on a publicly-accessible website to encourage transparency and bring building energy usage to the public's attention.<sup>59</sup> The platform has also led to savings through facilitation of demand response programs<sup>60</sup>, deregulated commodity purchasing, and bill auditing and analysis. For example, detailed utility billing analysis revealed a \$91,000 electronic billing error on behalf of PEPCO. DGS also uses the platform as the basis for an energy conservation competition between agencies meant to increase energy awareness and motivate state employees to conserve energy. Additional information on DGS' strategy and implementation of the State Energy Database is available from the U.S. DOE in

<sup>&</sup>lt;sup>59</sup> Maryland Department of General Services, Public Energy Database. Accessed: 7/29/19. Available at: http://www.dgs.maryland.gov/Energy/Database/EnergyDatabasePublic.html

<sup>&</sup>lt;sup>60</sup> Khalil, Mona. *Streamlining Utility Data Access: Best Practices from State and Local Governments and School Districts*. Weatherization and Intergovernmental Program, U.S. Department of Energy. November 12, 2014. Accessed: 7/29/19. Available at:

http://www.neep.org/sites/default/files/resources/DOE.Streamlining.Data\_.Access.Presentation.11.12.14.pdf

the forthcoming guide on Energy Data Collection and Tracking in the Public Sector: Best Practices for Establishing a Robust and Sustainable Energy Data Management Program, available through the State and Local Solution Center.61

#### **New Hampshire**

In order to push forward with the state's energy efficiency goals, New Hampshire recently passed Bill SB284, which establishes a statewide, multi-use online energy data platform.<sup>62</sup> The hope of the state in passing this bill is that this dashboard will empower the community by providing customers and stakeholders with safe, secure access to information about their energy usage.<sup>63</sup> The online display will enable the aggregation and anonymization of community-level energy data and require a consent-driven process for access to or sharing of customer-level energy usage data. Passing this bill opened many doors for the state, including "innovative business applications that will save customers money as well as [facilitation of] municipal and county aggregation programs. Such a program of robust data would also likely to be useful in local planning, conducting market research, fostering increased awareness of energy consumption patterns, and the adoption of more efficient and sustainable energy use".<sup>64</sup>

## Portfolio Manager Web Services Data Exchange

Portfolio Manager data exchange web services is an application programing interface<sup>65</sup> that allows utilities to automatically upload cost, consumption, and billing period data directly into EPA's ENERGY STAR Portfolio Manager<sup>66</sup> platform on a routine basis (typically monthly) via software-to-software communication. To utilize this data exchange solution, an energy manager must first determine if utilities that service the organization's portfolio are capable of exchanging data directly with Portfolio Manager.<sup>67</sup>

Currently, there are over 90 providers nationwide that offer this service located all across the nation.<sup>68</sup> If a utility's database is configured to exchange data with Portfolio Manager, the energy manager must create a new account or use an existing Portfolio Manager account to first add the utility as a contact, and then send a connection request to the utility. Upon agreement to the utility's terms and conditions, the utility will accept the connection request. The energy manager may now share data exchange access to the property and commodity

<sup>67</sup> See <u>here</u> for full list of PM Web Services compatible utilities

<sup>&</sup>lt;sup>61</sup> State and Local Solution Center, Weatherization and Intergovernmental Program Office, U.S. Department of Energy. Accessed: 7/29/19 Available at: http://energy.gov/eere/slsc/state-and-local-solution-center

<sup>&</sup>lt;sup>62</sup> General Court of New Hampshire – Bill Status System. SB284. Accessed: 7/30/19. Available at:

http://gencourt.state.nh.us/bill status/bill status.aspx?lsr=1025&sy=2019&sortoption=&txtsessionyear=2019&txtbillnumber=SB284 <sup>63</sup> General Court of New Hampshire – Bill Status System. SB284. Accessed: 7/30/19. Available at:

http://gencourt.state.nh.us/bill\_status/bill\_status.aspx?lsr=1025&sy=2019&sortoption=&txtsessionyear=2019&txtbillnumber=SB284 <sup>64</sup> LegiScan. BillText SB284. Accessed: 7/30/19. Available at: https://legiscan.com/NH/text/SB284/id/1968150.

<sup>&</sup>lt;sup>65</sup> An application programing interface specifies how some software components should interact with each other.

<sup>&</sup>lt;sup>66</sup> EPA's Portfolio Manager is a free online energy management and tracking tool that calculates 1 – 100 ENERGY STAR scores for eligible commercial and institutional buildings, such as K-12 schools, office buildings, and many others. Portfolio Manager also allows you to track improvements over time, compare similar buildings within a portfolio, generate reports, and quantify greenhouse gas emissions. For training on how to use Portfolio Manager, visit http://www.energystar.gov/buildings/training?c=business.bus internet presentations.

<sup>&</sup>lt;sup>68</sup> Department of Energy's energystar.gov. "Service Providers that Exchange Data with Portfolio Manager via Web Services." Accessed: 7/26/19. Available at: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/experthelp/find-energy-star-service-a-0

meter, and will also specify any service account or meter identification information as required by the utility. Up to 12 months of energy consumption and cost data are typically uploaded to the account each month.

Two types of organizations typically utilize data exchange: (1) utilities, and (2) third-party data analysis firms.

Customers whose utilities offer automated data exchange typically must actuate the direct transfer of their utility data into Portfolio Manager.<sup>69</sup> Customers must then also input other information (e.g. square footage, fuel oil, etc.) for an accurate analysis. States such as California and Washington have addressed this burden on customers by legislatively requiring investor-owned utilities to provide data exchange services.<sup>70</sup>

In instances where investor-owned utilities do not offer data exchange, customers can utilize a third-party data analysis firm to facilitate data exchange. The third-party firm will collect a customer's energy usage data from several sources, inputting data points into proprietary software which then exchanges data with Portfolio Manager.<sup>71</sup>

A full listing of organizations that exchange data with Portfolio Manager via Web Services is available on the EPA website: <u>Service Providers that Exchange Data with Portfolio Manager via Web Services.</u><sup>72</sup>

## **Commercial Sector Multi-Tenant Privacy Concerns**

If utilities implement a data exchange program that covers the entire commercial rate class, that tool would be accessible by owners of multi-tenant buildings, thereby raising obvious landlord-tenant privacy concerns. Providing building owners with aggregated and anonymized whole building energy usage data is becoming the accepted solution for these concerns.<sup>73</sup> Building data aggregation is the act of compiling building energy data into one place where it can be viewed and used to understand energy usage and strive towards energy efficiency measures. Accessible energy usage data can open up an endless number of doors for tenants, utility providers, and building owners to better manage their energy consumption which leads to monetary savings and a number of environmental benefits. In addition, local governments can use aggregated data for city planning purposes to reduce total energy consumption and become greener as a community.

When considering a benchmarking policy, transparency and data access is critical and communities should consider defining what will be considered public data in the benchmarking policy. To conduct benchmarking, building owners need access to data, but are often prohibited from accessing energy information for tenant-occupied spaces, where the tenant is the utility customer on record. One way to gain access is to set a data

<sup>&</sup>lt;sup>69</sup> US Environmental Protection Agency. *Using Web Services to Exchange Data with Portfolio Manager*. Accessed: 4/28/15. Stating: "customers can request that you import their energy data directly into their Portfolio Manager accounts. This saves time and allows them to view and track ENERGY STAR scores in their Portfolio Manager account without the hassle of entering utility bill data every month." Available at: <u>http://www.energystar.gov/buildings/service-providers/service-and-product-providers/use-web-services-exchange-data-portfolio-manager</u> <sup>70</sup> RCW 19.27A.170 (Stating that "a qualifying utility shall upload the energy consumption data for the accounts specified by the owner for a building to the United States Environmental Protection Agency's ENERGYSTAR Portfolio Manager") Accessed: 7/26/19. Available at: <u>http://apps.leg.wa.gov/RCW/default.aspx?cite=19.27A.170</u>

<sup>&</sup>lt;sup>71</sup> For more information, see the <u>Third Party Data Analysis Services</u> section.

<sup>&</sup>lt;sup>72</sup>US Environmental Protection Agency. *Service Providers that Exchange Data with Portfolio Manager via Web Services*. Accessed: 7/26/19. Available at: <u>http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/expert-help/find-energy-star-service-a-0</u>

<sup>&</sup>lt;sup>73</sup> See Generally, Wait, Wayne (et.al.). A Case for Aggregate and Anonymized Whole Building Energy Data in the Multi-Family Sector. Accessed: 4/28/15. Available at:

http://www1.eere.energy.gov/buildings/betterbuildings/accelerators/documents/case aggregate anonymized whole building energy data april 2014. pdf

aggregation threshold to simplify the tenant authorization process. Through this pathway, the utility provides building owners with aggregated energy usage information without the need for individual tenant authorization based on the aggregation threshold.<sup>74</sup> Most utilities offering aggregated and anonymized data require tenant consent if a building has either: (1) a small number of tenants; or (2) one tenant uses a significant proportion of the building's energy.

## **Establishing Data Aggregation Thresholds**

The most important aspect of creating data aggregation policies is to individualize the efforts based on the target community. Based on the size, building stock, and other characteristics of the area's specific grid, they may need to outline more flexible or more stringent standards on how tenants are required to disclose aggregated energy data with their building owners. The main goal of a building aggregation policy is finding a threshold that will incorporate the greatest number of buildings without putting the privacy of tenants at risk in any way. Many communities find that having a low threshold with an energy consumption percentage threshold per unit is a great way to maintain customer privacy in multi-tenant buildings. This is one of the many considerations involved in crafting the appropriate policy. Broadly speaking, the lower the threshold, the more buildings that can be captured within the policy framework, however the lowest threshold is not the best for every area. Analyzing the building stock, local needs, and policy goals is extremely important to finding the right threshold that can incorporate the maximum number of buildings.

In addition to setting up the foundation of data aggregation within the community via a bill or law, it is equally as important to direct community members to the proper resources that allow them to perform the data aggregation itself. For example, Portfolio Manager is a very user-friendly and free tool that can be used to track and improve the energy efficiency of any property. In the end, no matter what threshold ends up being put in to place, it is extremely important that customer data is kept confidential, which can be done in a number of ways including aggregating customer data from the meter level to the building level. A great way to start thinking about an aggregation threshold is to examine the established thresholds of other communities. The table below outlines the aggregation thresholds of various building stocks and population densities.

<sup>&</sup>lt;sup>74</sup> DOE Better Buildings, Energy Data Accelerator, Best Practices for Providing Whole-Building Energy Data: A Guide for Utilities, January 2016, Available at:

https://betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/Best%20Practices%20for%20Providing%20Whole-Building%20Energy%20Data%20-%20Guide%20for%20Utilities.pdf

## Aggregation Threshold Examples Based on Building Stock and Size

Jurisdiction	Utility Company	Aggregation Thresholds	Building Stock All housing types not mentioned account for <10%	Size and Population
Greater Austin Area, Texas	Austin Energy	4/80%	50% single unit detached, 20% 20+ units.	2.17 million people in 4,278 square miles.
New York City	Consolidated Edison and PSEG Long Island	2	41.7% single unit detached, 22.9% 20+ units, 10.9% two units.	8.4 million people in 302.6 square miles.
Boston, MA	Eversource and National Grid	4/50%	26% 3-4 units, 21.5% 20+, 14.6% two units, 11.7% single unit detached, 11.6% 5-9 units.	685,000 people in 89.63 square miles.
Washington DC	Рерсо	5	31.1% 10-19 units, 26.1% single unit attached, 13.9% 5-9 units, 13.4% 3-4 units.	682,000 people in 68.3 square miles.
Vermont State	Statewide	4	69.8% single unit, 16.7% 3+ units.	626,000 people in 9,616 square miles.

## New York

In an attempt to grant public access to information previously only given to utility companies, New York introduced a bill on whole building data aggregation standards. Not only would this allow customers to make informed decisions regarding the housing market, but also promotes the bigger goals of energy transparency and working towards becoming more energy efficient. Through analysis of their own building energy usage, customers can also understand how they can make improvements within their systems to better their energy efficiency and, in turn, save money.

The first attempt of this was that of a 15/15 privacy standard for general use by utilities proposed by the Joint Utilities in New York.<sup>75</sup> Although ensuring protection of resident privacy, a 15/15 energy data standard is extremely restricting because only buildings with fifteen or more units and no single unit consuming more than 15 percent of the total building's energy usage can be incorporated. This highly limits the number of buildings involved because it is so conservative. After rejecting this proposal, The Commission looked into a 4/50 standard, which would include any buildings with more than four units and no one unit accounting for over 50%

<sup>75</sup> State of New York Public Service Commission. Accessed: 7/30/19. Available at:

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http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwi\_tp\_V59zjAhUsw1kKHZwUAcw QFjAAegQlAhAC&url=http%3A%2F%2Fdocuments.dps.ny.gov%2Fpublic%2FCommon%2FViewDoc.aspx%3FDocRefId%3D%257B4C4CE28E -54CC-4514-967D-B513678E3F37%257D&usg=AOvVaw2I-jp2ELbAEZ3miqpzlalf

of the total building energy use.<sup>76</sup> This standard would include a greater number of buildings while still protecting the privacy of individual tenants through secure access to information and a consent-driven sharing process. The 4/50 standard is also especially helpful to buildings that encompass both apartment units and a storefront because the 50 percent threshold protects the storefront's greater energy usage.

In addition to creating aggregation thresholds, the commission has also adopted a <u>Utility Energy Registry</u> (UER). According to the order, the UER will be an online platform that will provide streamlined public access to aggregated community-scale utility energy data. The UER is intended to promote and facilitate community-based energy planning and energy use awareness and engagement.<sup>77</sup> The utilities are required to upload the datasets every six months (January to June and July to December) within 30 days of the close of each semi-annual period to the UER. Taking steps to enable data access for whole building energy usage and creating a platform to provide public access to community-scale data will enable transparency as the state begins to implement the strategies that are outlined in the Governor's New Efficiency New York Plan.

## **Third Party Data Analysis Services**

As mentioned above, many third-party vendors offer utility data analysis services. Such services often include the collection and verification of utility data, as well as non-utility data (square footage, fuel oil usage, etc.). This data can be gathered in several ways, including:<sup>78</sup>

- Customer forwards invoices (accounts receivable sends a scan or fax);
- Customer consents to duplicate invoices, sent from utility to third party;
- Customer consents to third party's electronic access of utility data;
- Data acquisition hardware installed on existing meters or sub-meters; and
- Data acquired through a building automation system.

Third-party data quality assurance and transfer protocols mentioned above can relieve in-house resource constraints. These services can be particularly useful for customers with large portfolios, such as state governments and large municipalities.<sup>79</sup>

Many of these third parties use customized software that interfaces with Portfolio Manager through data exchange. One example of this is Minnesota's B3 Benchmarking tool, which was developed—and is currently administered by—the Weidt Group. Several other examples are mentioned in the "Exemplary Statewide Energy Data Tracking and Analysis Efforts within the Region" section.

## The B3 Benchmarking Tool

The B3 Benchmarking tool was developed by the state of Minnesota through third-party contractor the Weidt Group to track public building energy usage as part of the state's *Buildings, Benchmarking, and Beyond* (B3)

<sup>&</sup>lt;sup>76</sup> Rethinking Energy Data Access. Accessed: 7/30/19. Available at: <u>https://www.imt.org/wp-content/uploads/2019/01/IMT\_RethinkingEnergyDataAccess.pdf</u>.

<sup>&</sup>lt;sup>77</sup> Utility Dive. *New York to Launch Utility Energy Registry*. Accessed: 7/30/19. Available at: <u>https://www.utilitydive.com/news/new-york-to-launch-utility-energy-registry-this-summer-in-data-gathering-ef/522266/</u>.

<sup>&</sup>lt;sup>78</sup> Supra, at <u>note 48</u>.

<sup>&</sup>lt;sup>79</sup> State and Local Solution Center. (forthcoming). *Energy Data Collection and Tracking in the Public Sector: Best Practices for Establishing a Robust and Sustainable Energy Data Management Program*. U.S. Department of Energy, Weatherization and Intergovernmental Program Office.

initiative, pursuant to a 2001 law.<sup>80</sup> In Minnesota alone, the platform currently tracks over 7,500 buildings representing over 300 million square feet of space. Maintaining the system requires data collection spanning 22 state agencies, 410 cities, 55 counties, 60 higher education campuses, and 2,014 school districts.<sup>81</sup>

The B3 tool is used to target candidates for retrofit and operational savings opportunities, as well as to provide measurement and verification after retrofits have been completed. To date, the tool has been used to identify over \$23 million in potential energy savings. Annual administrative costs total approximately \$225,000, or \$750 per million square feet of building space.<sup>82</sup> A unique value-add of the platform is its ability to compare "energy performance relative to a simulated reference building based on a specific standard, such as an energy code."<sup>83</sup> The platform also boasts a web portal (pictured below) disclosing public building energy usage to build accountability and transparency around energy conservation.<sup>84</sup>



The state of Minnesota granted the Weidt Group a license to the tool, which they have used for several years to help lowa municipalities benchmark and disclose its public building energy usage.<sup>85</sup> In the private sector, Seattle's *2030 District* is using B3 to benchmark and disclose building energy usage.<sup>86</sup> Although the platform has been around for a number of years, it remains a best practice example of tools developed and utilized to track community energy usage.

<sup>81</sup> Minnesota B3 Benchmarking. *Current Statistics*. Accessed: 7/26/19. Available at: <u>https://mn.b3benchmarking.com/Statistics</u>

<sup>83</sup> Supra, at note 48, Page 30.

<sup>&</sup>lt;sup>80</sup> McDougall, Tom. The Weidt Group. Buildings Benchmarks and Beyond. (June 2014) Accessed: 4/28/15. Available at: <u>http://www.nga.org/files/live/sites/NGA/files/pdf/2014/1406LBELearningLab-McDougall.pdf</u>

<sup>&</sup>lt;sup>82</sup> Supra, at <u>48</u>, Page 26 (Describing annual operating expenses as comprised of "help desk support, management, software system maintenance, occasional data requests, promotion, and training")

<sup>&</sup>lt;sup>84</sup> State of Minnesota B3 Benchmarking Rating and Disclosure System. Accessed: 4/28/15. Available at: <u>https://mn.b3benchmarking.com/Report.aspx?r=1</u>

<sup>&</sup>lt;sup>85</sup> State of Iowa B3 Benchmarking Map. Accessed: 4/28/15. Available at: <u>https://ia.b3benchmarking.com/Report.aspx</u>

<sup>&</sup>lt;sup>86</sup> Seattle 2030 District B3 Benchmarking & FirstView<sup>™</sup> Analysis (February 2014) Accessed: 4/28/15. Available at: <u>http://2030districts.org/sites/default/files/seattle/2030 Presentation Benchmarking Report 01.11.14.pdf</u>

## A Path to Public Sector Building Energy Benchmarking

## **Regional Best Practices**

#### 1. Mandating State Programs and Incentivizing Municipal Programs

#### Background:

Top-down public sector administrative structures can *and should* be leveraged to mandate building energy benchmarking in state-owned buildings. Legislation is one method of accomplishing this goal, but an even more important tool is the executive order- which needs no legislative approval for implementation. A number of states within the Northeast and Mid-Atlantic region have leveraged executive orders to mandate benchmarking in state-owned buildings without the need for legislative action.

Administrative structures surrounding municipal facility operation and maintenance are typically less centralized and structured than at the state level. However, statelevel legislation can be used to incentivize building energy benchmarking and other municipal energy efficiency best practices. The success of the Massachusetts Green Communities Act in this capacity is a clear indicator that, under the right circumstances, incentives can be just as persuasive as mandates.

#### In Action:

- New York, Delaware, and Massachusetts have leveraged executive orders to mandate benchmarking in state-owned buildings without legislative action.
- Massachusetts uses statewide legislation to incentivize public sector building energy benchmarking and other energy efficiency best practices.

#### 2. Early Stakeholder Engagement

#### Background:

Early stakeholder engagement is a key tool in the collaborative process, and can be used to leverage outcomes that all affected actors can agree upon. This assertion rings true for public sector building energy benchmarking and utility data access discussions. For example, the Better Buildings Data Accelerator Partnership agreement<sup>87</sup> explicitly requires a stakeholder engagement process to facilitate partnerships between the public and private sector. Further, lessons learned in Philadelphia and other cities across the nation seeking to benchmark and disclose building energy usage indicate that early stakeholder engagement can have a lasting effect on outcomes. Municipalities seeking to streamline utility data access should engage regulators, utilities, elected officials, and other jurisdictions early in the process to optimize outcomes.

#### In Action:

 Lessons learned in Cambridge, Philadelphia, and other cities across the nation seeking to benchmark and disclose building energy usage indicate that early stakeholder engagement can have a lasting effect on outcomes. For example, Cambridge began engaging the business community, utility program administrators, and building owners long before attempting to enact a benchmarking and disclosure ordinance, and as a result saw very little opposition during the passage and implementation phase.

<sup>&</sup>lt;sup>87</sup> US Department of Energy. *Energy Data Accelerator Fact Sheet. Accessed 9/22/2016. Available at:* <u>https://betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/EnergyDataFactsheet.pdf</u>

#### 3. Leveraging Academic Institutions and Regional Nonprofit Organizations as a Resource

#### Background:

Academic institutions and other nonprofit organizations can be an important resource for municipalities planning to implement public sector benchmarking initiatives. Partnerships between academia and state energy officials can serve both parties equally. Students can gain valuable insight from fellowships and other opportunities in the energy field, while the state benefits by developing workforce capacity in a rapidly evolving sector.

Outside the realm of academia, other nonprofit organizations can also serve as a resource to connect forward-thinking organizations with emerging talent in the energy efficiency field, in a way that benefits both parties. For example, the Environmental Defense Fund's Climate Corps program connects participating organizations with fellows from the nation's leading institutions to help them "find innovative ways to measure, analyze, and reduce organizational energy use."<sup>88</sup>

#### In Action:

- Rhode Island's Energy Office leverages the skillset of upper-classman from the University of Rhode Island known as "Energy Fellows" to facilitate public building benchmarking. The Energy Fellows offer to walk municipalities through the process of identifying, sorting, and inputting data into the US EPA's ENERGY STAR Portfolio Manager.
- Connecticut Department of Energy and Environmental Protection leverages Eastern Connecticut State University's Institute for Sustainable Energy to facilitate benchmarking at municipal facilities throughout the state.
- New York has located its NYEnergyManager facility within the College of Nanoscale Science and Engineering at SUNY Polytechnic Institute in Albany, NY.
- The Environmental Defense Fund manages a Climate Corps program that connects participating organizations with emerging talent from the academic field to measure, analyze, and reduce organizational energy use.

#### 4. Cost Recovery for Data Exchange

#### **Background:**

Investor-owned utilities throughout the region could develop Portfolio Manager Data Exchange capabilities, recovering their costs through demand side management program funding. PECO, BG&E, and other utilities around the country are demonstrating that Data Exchange systems provide value for utilities, demand side management programs, and ratepayers. It is likely that as more cities push for implementation of building energy usage disclosure ordinances, the value provided by data exchange services will become even more apparent.<sup>89</sup>

Municipal facility managers could leverage such data exchange capabilities to reduce burdensome and errorprone data input processes. Municipalities seeking assistance with data quality control—or a more detailed level of analysis than provided by Portfolio Manager should consider contracting with a third party for energy management services.

#### In Action:

- Utility data exchange with Portfolio Manager—formerly known as "automated benchmarking" and now known as Web Service—can ease the administrative burden and data quality concerns associated with manual input of meter data by resource constrained municipal officials, resulting in greater customer satisfaction.
- Investor-owned utilities throughout the region could develop Portfolio Manager Data Exchange capabilities, recovering their costs through demand side management (DSM) program funding.
- Data exchange systems may facilitate DSM advertising and promotion, measurement and verification, and behavioral program delivery.
- Facilitating implementation of a building energy rating and disclosure ordinance, PECO and Veolia were the first utilities in our region to offer automated data exchange with Portfolio Manager to commercial and municipal customers. Baltimore Gas and Electric recently recovered

<sup>&</sup>lt;sup>88</sup> Environmental Defense Fund. Climate Corps Projects. Available at: <u>http://edfclimatecorps.org/projects/results</u>

<sup>&</sup>lt;sup>89</sup> For a current map of such disclosure initiatives, see <u>www.Buildingrating.org</u>

their costs for data exchange implementation through their demand side management program funding.

#### 5. Portfolio-Wide Energy Management Systems for State and Municipal Buildings

#### Background:

Portfolio-wide energy management systems can provide savings at the state or local government level. From commodity purchasing strategies to coordinated demand response, state and local governments can save taxpayers millions of dollars by leveraging energy data. Advanced metering infrastructure and other data-driven technologies are changing the way energy is managed. States like New York, Massachusetts, and Maryland are leveraging leadership and collaboration to implement portfolio-wide energy management systems that drive energy savings, save taxpayer dollars, build workforce capacity, and drive the industries of tomorrow to *their* state capitals.

#### In Action:

- In New York, Massachusetts, Maryland, and Washington DC, advanced metering infrastructure and other data-driven technologies are changing the way energy is managed. Portfolio-wide energy management systems can provide millions of dollars in savings to states and large municipalities. For example:
  - New York's Energy Manager Program is projected to save approximately \$25 million annually, or five percent of the state's \$500 million energy bill.
  - Massachusetts's Enterprise Energy Management system has identified over \$2.2 million worth of state building operational savings alone.
  - Analysis through Maryland's Energy CAP platform identified a \$91,000 billing error.

Roles & Responsibilities				
Public Sector Facility Managers				
<ul> <li>Action: Consider alignment with academic institutions or nonprofit organizations for assistance tracking utility data. State entities and large cities should consider contracting with a third party for energy management services.</li> <li>Action: Benchmark public sector buildings and implement building energy retrofits.</li> <li>Action: Communicate to public officials: (1) the costbenefit proposition of building energy benchmarking; and (2) the labor savings and manual input error eliminated by streamlined data access methods.</li> </ul>	Benefit: Recognition for exemplary facility operation at reduced costs			
Public Sector Officials				
• Action: Communicate the value of benchmarking to utility representatives, state energy offices, and regulatory staff. Appendix A provides a draft outreach	<b>Benefit:</b> Improved budgetary capacity due to best practice building operation and maintenance that can now be allocated toward energy management, resulting in further benefits.			

<ul> <li>letter for regulatory and efficiency program administrator staff.</li> <li>Action: Consider appointing an energy manager whose sole responsibility is to ensure that energy management best practices are ingrained in the core operating policies of the municipality.</li> </ul>	
Academic and other Non-Gover	rnmental Organizations
<ul> <li>Action: Consider establishing partnerships with municipal and state governments where students can aid facility managers in the tracking and analysis of utility data, providing training and data entry services.</li> <li>Action: Consider action to organize a unified voice for municipal and state government in favor of streamlined access to utility data.</li> </ul>	<b>Benefit:</b> Students gain valuable experience in an increasingly important field
Regulator	'S
• Action: Direct utilities to implement Green Button Protocol and enable Data Exchange with the US EPA's ENERGY STAR Portfolio Manager, granting cost recovery via energy efficiency program budgets.	<b>Benefit:</b> Improvement in cost-effective energy efficiency programs
Utilities	
• Action: Standardize utility data storage systems in a manner that allows for easy implementation of Green Button Initiative and Portfolio Manager Data Exchange.	<ul> <li>Benefit: Receive cost recovery of streamlined data access implementation through energy efficiency portfolio program.</li> <li>Benefit: Evidence suggests that utilities offering streamlined access to utility data receive higher customer service ratings and can use benchmarking data to optimize efficiency program implementation.</li> </ul>

## Conclusion

Building energy benchmarking is a widely-accepted best practice meant to improve building performance, reduce energy consumption, and reduce carbon emissions. The opportunities for reduced energy consumption are especially pertinent in the public sector, where facility portfolios are large, comprised of structures at various points in their lifecycle, and present sizable opportunities for energy savings. Yet, access to meaningful and actionable energy data has been a challenge for many states and municipalities due to a sea of bills and invoices spanning multiple utilities, external record-keepers, and internal administrative structures.<sup>90</sup>

Efforts can and should be taken to overcome the resource constraints that often lead to a lack of dedicated funding, sometimes leaving benchmarking efforts to be implemented sporadically by temporary staff, rather

<sup>&</sup>lt;sup>90</sup> For further information on energy data use cases and associated barriers, See Generally, California Public Utility Commission Decision 14-05-016, *Decision Adopting Rules to Provide Access to Energy Usage-Related Data While Protecting Privacy of Personal Data*. (May 2014) Accessed: 4/28/15. Available at: <u>http://switchboard.nrdc.org/blogs/lettenson/CPUC%20Data%20Access%20Decision May%201,%202014.pdf</u>

than a dedicated energy manager or energy management office at the state level. Facility managers, municipal officials, and state energy officials can all contribute to the case for the dedicated resources needed for pursuit of benefits that flow from building energy benchmarking.

The benefits of streamlined data access are clear; whether through EDI, an Online Energy Data Dashboard, Data Exchange, or third-party services, simplified utility data access for municipalities can save money, time, and carbon emissions. This is especially true in the public sector, where the need for energy management is strong, but resource constraints can be commonplace. States, municipalities, and taxpayers stand to benefit from streamlined data access options.

## Appendix A: Sample Outreach to Regulatory and Efficiency Program Staff

We, municipalities and concerned parties within the Distribution Service Territory of **[INSERT UTILITY NAME]**, are contacting you to express our need for machine-readable electronic access to customer data to streamline our ability to retrieve data to facilitate building energy benchmarking, identify billing errors, assist third party energy data analysis, and encourage participation in energy efficiency programs leading to energy efficiency retrofits.

We believe that both taxpayers and ratepayers would benefit significantly from implementation of **Green Button** and **Green Button Connect My Data** Initiative, as well as the US Environmental Protection Agency (EPA)'s **ENERGYSTAR Portfolio Manager's Data Exchange** option ("Automated Benchmarking").

#### Public Sector Building Energy Benchmarking:

- Reduced Energy Usage and Costs. This is important because buildings are responsible for approximately 40 percent of global energy usage and related emissions.<sup>91</sup> Tracking energy usage is an essential first step toward reducing energy consumption and associated costs because such tracking can be used to identify opportunities for strategic energy investments. The EPA notes that building owners who consistently benchmark energy usage save 2.4 percent of their energy per year.<sup>92</sup>
- Identified Billing Errors. Comparing a building's billed energy usage at varying points in time can help building owners detect clerical errors which may have resulted in higher-than-warranted energy bills.
- Leading by Example. Economies of scale within the public sector present a unique opportunity to lead by example and catalyze transformation in the broader commercial market. Furthermore, the prominence of public buildings within the broader built environment affords a unique opportunity for the public sector to lead by example, disseminating building energy conservation best practices such as benchmarking into the broader community. For example, court houses, schools, and town halls often see high volumes of varying occupants who may benefit from exposure to such practices.

Streamlined access to utility data would reduce administrative burdens and manual input errors associated with building energy benchmarking initiatives, especially in the public sector where building energy usage portfolios span a multitude of utilities and fuel types. In turn, this would encourage public sector building energy benchmarking initiatives, resulting in several different benefits including:

#### Streamlining Utility Data Access Benefits Ratepayers and Efficiency Programs:

<sup>&</sup>lt;sup>91</sup> United Nations Environmental Program (UNEP). *Buildings and Climate Change: Summary for Decision Makers*. (2009) Page 6. Available at: <u>http://www.unep.org/sbci/pdfs/sbci-bccsummary.pdf</u>

<sup>&</sup>lt;sup>92</sup> US Environmental Protection Agency. ENERGYSTAR Portfolio Manager: Benchmarking and Energy Savings Data Trends. Available at: <a href="http://www.energystar.gov/sites/default/files/buildings/tools/DataTrends\_Savings\_20121002.pdf">http://www.energystar.gov/sites/default/files/buildings/tools/DataTrends\_Savings\_20121002.pdf</a>

In 2011, the National Association of Regulatory Utility Commissions (NARUC) issued its *Resolution on Access to Whole-Building Energy Data and Automated Benchmarking*.<sup>93</sup> The National Association of State Utility Consumer Advocates (NASUCA) supplemented this with its own similar resolution<sup>94</sup>. This resolution urged public utility commissions seeking to capture cost effective energy savings to consider comprehensive benchmarking policies that:

(1) Use EPA's ENERGY STAR Portfolio Manager automated benchmarking services;

(2) Leverage energy data associated with automated benchmarking to accurately credit program impact to benchmarking and drive efficiency programs; and

(3) Provide aggregated and anonymized building energy data where necessary.

#### Streamlined Utility Data Access can Cost-Effectively Contribute to Efficiency Program Budgets:

- Increased implementation of building energy benchmarking initiatives due to reduced administrative burden, especially in the public sector where building energy usage portfolios consist of a multitude of bills and invoices spanning many different buildings and fuel types.
- Greater participation in energy efficiency programs due to increased ratepayer awareness of energy investment opportunities, as well as possibilities for leveraging energy usage data for targeted implementation of utility energy efficiency programs.
- More effective behavioral energy efficiency program delivery through the increased visibility of energy usage trends provided through interval meter data.
- Alternative methods of efficiency program measurement and verification in certain cost-effective scenarios.

We believe streamlined data access options should be implemented by our distribution utility, and that regulators should grant them cost recovery for implementation within their energy efficiency program budget. Evidence suggests that streamlining access to utility energy data would result in:

- Increased implementation of building energy benchmarking initiatives due to reduced administrative burden, especially in the public sector where building energy usage portfolios consist of a multitude of bills and invoices spanning many different buildings and fuel types.
- Greater participation in energy efficiency programs due to increased ratepayer awareness of energy investment opportunities, as well as possibilities for leveraging energy usage data for targeted implementation of utility energy efficiency programs.
- More effective behavioral energy efficiency program delivery through the increased visibility of energy usage trends provided through interval meter data.
- Alternative methods of efficiency program measurement and verification in certain cost-effective scenarios.

<sup>&</sup>lt;sup>93</sup> National Association of Regulatory Utility Commissions. *Resolution on Access to Whole-Building Energy Data and Automated Benchmarking*. (July 2011) Available at: <u>http://www.naruc.org/Resolutions/Resolution%20on%20Access%20to%20Whole-Building%20Energy%20Data%20and%20automated%20benchmarking.pdf</u>

<sup>&</sup>lt;sup>94</sup> National Association of State Utility Consumer Advocates. *Resolution Supporting Automated Benchmarking of Multifamily Buildings for Energy Efficiency Purposes*. (November 2013) Available at: <u>http://nasuca.org/2013-05-supporting-automated-benchmarking-of-multifamily-buildings-for-energy-efficiency-purposes/</u>

#### Supporting Municipalities and Concerned Parties Contact Information:

Municipality	Point of Contact	Contact Information



## **Appendix B: Recommend Actions for Streamlining Utility Data Access**

## **Appendix C: Key Resources**

#### **Region's Executive Orders**

- Delaware <u>http://governor.delaware.gov/orders/exec\_order\_18.shtml</u>
   Massachusetts
  - http://www.mass.gov/anf/docs/dcam/dlforms/energy/energy-eo484-final.pdf
- New York
   <u>http://www.dec.ny.gov/energy/71363.html</u>
- Boston, MA
   <u>http://www.cityofboston.gov/images\_documents/Signed%20Ordinance\_tcm3-38217.pdf</u>

#### **Region's Municipal Ordinances**

- Philadelphia, PA
   <u>http://legislation.phila.gov/attachments/13351.pdf</u>
- Pittsburgh, PA <u>https://www.go-gba.org/wp-content/uploads/2016/10/Legislation-Text.pdf</u>
- New York, NY
   <u>http://www.nyc.gov/html/planyc2030/downloads/pdf/ll84of2009\_benchmarking.pdf</u>
- Washington, DC
   <u>http://dcclims1.dccouncil.us/images/00001/20080819161530.pdf</u>

#### **Region's Legislation**

- Connecticut <u>http://www.cga.ct.gov/2013/act/pa/pdf/2013PA-00298-R00HB-06360-PA.pdf</u>
- Maryland
   <u>http://energy.maryland.gov/incentives/state-local/sbeeca/SB267.pdf</u>

#### **US Department of Energy Resources**

- State and Local Solutions Center: Access and Use Energy Data <u>http://energy.gov/eere/slsc/access-and-use-energy-</u> <u>data?Assistance\_Area=Access%20and%20Use%20Energy%20Data</u>
- Toolkit: Energy Data Access: Blueprint for Action
   <u>http://betterbuildingssolutioncenter.energy.gov/toolkits/energy-data-access-blueprint-action</u>
- Energy Data Collection and Tracking in the Public Sector: Best Practices for Establishing a Robust and Sustainable Energy Data Management Program (Forthcoming)
- SEE Action: A Regulator's Guide to Third Party Data Access for Energy Efficiency https://www4.eere.energy.gov/seeaction/system/files/documents/cib\_regulator\_privacy\_guide\_0.pdf
- SEE Action: Benchmarking and Disclosure State and Local Policy Design Guidance and Sample Language https://www4.eere.energy.gov/seeaction/system/files/documents/commercialbuildings\_benchmarking\_ policy.pdf
- Lawrence Berkeley National Lab: Building Energy Data Exchange Specification (BEDES) Online Dictionary https://bedes.lbl.gov/bedes-online

#### **US Environmental Protection Agency Resources**

- ENERGY STAR Portfolio Manager Training Presentations http://www.energystar.gov/buildings/training?c=business.bus\_internet\_presentations
- ENERGY STAR Portfolio Manager Quick Start Guide http://www.energystar.gov/sites/default/files/tools/EnergyStar\_QuickStart\_508.pdf
- ENERGY STAR Guidelines for Energy Management <a href="http://www.energystar.gov/sites/default/files/buildings/tools/Guidelines%20for%20Energy%20Management%206\_2013.pdf">http://www.energystar.gov/sites/default/files/buildings/tools/Guidelines%20for%20Energy%20Management%206\_2013.pdf</a>
- Using Web Services to Exchange Data with Portfolio Manager <u>http://www.energystar.gov/buildings/service-providers/service-and-product-providers/use-web-services-exchange-data-portfolio-manager</u>

#### Northeast Energy Efficiency Partnerships Resources

- Building Energy Benchmarking and Disclosure Policies in the Northeast and Mid-Atlantic
   <a href="http://www.neep.org/sites/default/files/resources/Benchmarking%20and%20Disclosure%20in%20the%2">http://www.neep.org/sites/default/files/resources/Benchmarking%20and%20Disclosure%20in%20the%2</a>
   ONortheast%20and%20Mid.Atlantic%20Final%204.6.15.pdf
- Building Energy Rating and Disclosure Policies: Update and Lessons from the Field http://www.neep.org/sites/default/files/resources/BER%20Supplement\_FINAL%20DRAFT\_2-25-13\_0.pdf
- Building Energy Rating and Disclosure Handout <u>http://www.neep.org/sites/default/files/resources/NEEP%20BER%20Supplement%20Handout%20Updat</u> <u>e7-20-16\_6.pdf</u>
- Regional Operations and Maintenance Guide for High Performance Schools and Public Buildings in the Northeast and Mid-Atlantic http://www.neep.org/sites/default/files/resources/O%26M%20Guide%20Revision%20v2.5\_FINAL.pdf
  - Minnesota Department of Commerce Division of Energy Resources: Integrating Benchmarking into Utility
- The Regulatory Assistance Project: *Driving Building Energy Efficiency with Aggregated Customer Data* http://www.raponline.org/document/download/id/6637
- Green Button Alliance Homepage http://greenbuttonalliance.org/
- Institute for Market Transformation: *Creating Value from Benchmarking: A Utility Perspective* <u>http://www.imt.org/uploads/resources/files/Creating Value From Benchmarking IMT.pdf</u>
- Institute for Market Transformation: Utilities' Guide to Data Access for Building Benchmarking <u>http://research.cbei.psu.edu/media/files/IMT\_Report\_-\_Utilities\_Guide\_-\_March\_2013.pdf</u> Conservation Improvement Programs to Capture Greater Energy Savings <u>https://mn.gov/commerce/energy/images/55323-71145-Weidt2014Benchmarking.pdf</u>

#### **Other Notable Resources**

#### Better Buildings Energy Data Accelerator

Upon completion of the US DOE's Better Buildings Initiative, the US DOE published a collection of resources entitled *Toolkit: Energy Data Access: Blueprint for Action*. This collection of case-studies, technical guidance, and best practices is a product of the work by accelerator city and utility partners to facilitate access to energy data for building owners. This strategic partnership led to the expansion of access to whole-building energy data by directly increasing the number of utilities and indirectly increasing the number of commercial customers served nationwide.

#### US DOE Tool: Building Energy Asset Score

The US DOE has developed a free tool for assessing the physical and structural energy efficiency of commercial and multifamily buildings. Using user-inputted data, this tool generates a score between 1 and 10 for the current energy efficiency of the building along with a "potential" score to demonstrate what the score could be if the user implemented the recommended efficiency improvements included in the Energy Asset Score Report.

For more information, visit the <u>Building Energy Asset Score website</u>