

Benchmarking Primer and Roadmap for Local Government



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ABBREVIATIONS

ACEEE	American Council for an Energy-Efficient Economy
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
BCAP	Building Codes Assistance Project
ICC	International Code Council
IECC	International Energy Conservation Code
NEEP	Northeast Energy Efficiency Partnerships
USDOE	U.S. Department of Energy

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Energy Efficient West Virginia is a group of concerned West Virginia residents, businesses, and community organizations that have come together to promote energy efficiency. It advocates for common-sense energy efficiency policy at the Public Service Commission, at the Legislature, and through work with local organizations and municipal governments.

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EXECUTIVE SUMMARY

Throughout the state of West Virginia, local government budgets are tight. With energy being one of the largest and most uncertain expenses, some may have just enough in their budget to keep the lights on. This primer introduces local governments to energy efficient benchmarking concepts, tools, and approaches to manage operating expenses while detailing the local economic benefits and job creation potential of energy efficiency programs.

Benchmarking is the process of measuring and then comparing a building's energy performance against either itself, modeled buildings, or comparable buildings over time. Benchmarking policies require certain building operators or owners to calculate energy performance for a building over time, and transparency (or disclosure) policies make the data available to the public. These two types of policies work together to raise awareness and incentivize energy efficiency measures in the marketplace.

Energy efficiency benchmarking provides local governments:

- the ability to compare operational costs of their buildings with other similar sized facilities,
- the insight on methods to cut energy expenses, and
- the certainty to make good budget decisions.

Benchmarking is a first step in reducing energy costs; over time it will allow local governments to achieve the most public good with the public dollar and create room in the budget to do more than just keep the lights on.

West Virginia leading by example

The State of West Virginia is leading by example in its campaign to improve energy efficiency and resiliency. House Bill (H.B.) 2667, introduced in the 2021 regular session and passed in the Senate in April 2021, established a benchmarking system for all state buildings and implemented mandatory requirements to reduce energy usage 25 percent below 2018 levels by 2030 as well as to submit annual progress reports to the Legislature. The West Virginia Office of Energy (WVOE) will audit all energy-metering devices in state buildings by 2026, auditing at least 20 percent of devices each year for five years. The energy usage data collected will then be submitted annually to the U.S. Environmental Protection Agency's ENERGY STAR program, the free-to-use standard for energy benchmarking. (H.B. 2667)

West Virginia first launched an energy tracking program in 2018, when it started to benchmark public K-12 schools, which is now nearly complete.

Benefits of benchmarking

While successful benchmarking and subsequent energy-saving actions reap an assortment of discrete benefits, most are rooted in economics. The most immediate benefit is reduced operating expenses from decreased utilities, which are a business' largest variable operating expense.

In West Virginia, inexpensive measures like benchmarking and utility auditing implemented by H.B. 2667 is estimated to save taxpayers approximately 15–28 percent of the average \$88–100 million in yearly utility costs of state buildings.

1. COMPREHENSIVE ENERGY MANAGEMENT THROUGH ENERGY CODES AND BENCHMARKING

Benchmarking is the linchpin of successful energy management because “you can’t manage what you don’t measure.” Benchmarking policies require certain building operators or owners to calculate energy performance for a building over time, and transparency (or disclosure) policies make the data available to the public. These two types of policies work together to raise awareness and incentivize energy efficiency measures in the marketplace. Benchmarking is typically required for public buildings and can be required or encouraged for large non-residential and multifamily properties. This primer provides a roadmap (see Chapter 5) that will help local leaders across the state adopt policies.

Benchmarking policies complement energy codes, as outlined in the *West Virginia Energy Code Primer*. But benchmarking has its own set of advantages that codes cannot address. These policies are “one of the top actions” a jurisdiction can take to support local businesses and protect taxpayers by lowering energy costs (SWEET, 2020).

Energy codes only apply to new construction and are less relevant once a building is occupied. Benchmarking, however, “encourages future energy efficiency improvements at the point in a building’s life cycle where the energy code no longer plays a role” (Hart, 2015, p. 14).

The major components of benchmarking are:

- **Measurement:** Collecting and analyzing building energy use data shows owners how their buildings’ energy use compares to that of similar buildings and highlights what can be improved.
- **Reporting:** Sharing the benchmarking results with an appropriate agency (city, county, or state) allows policymakers to assess the effectiveness of their programs, allocate resources, and demonstrate fiscal responsibility.
- **Transparency:** Benchmarking data made available to the public allows all potential stakeholders to engage in achieving energy goals, while empowering individuals and businesses with additional insights into real estate transactions. (IMT, 2015)

Energy codes recap

Energy codes regulate the physical components of a building that affect energy use, while benchmarking measures energy efficiency in daily operations.

Energy codes establish minimum energy efficiency requirements for the physical characteristics of a building and are the first building block to energy efficiency of the built environment.

Enforcing energy codes achieves significant savings. Between 2012 and 2040, energy codes are projected to save U.S. homes and businesses \$126 billion and 12.82 quads of primary energy (Mendon et al., 2015; DOE, 2017). Considering that residential and commercial buildings consume 40 percent of the nation’s energy—and that energy codes regulate as much as 80 percent of a building’s energy load—adopting and enforcing energy codes can reduce total national energy demand by one-third. (USDOE, 2015)

2. BENEFITS OF BENCHMARKING

Governments, businesses, and individuals increasingly demand energy efficiency. But because energy performance is generally only revealed through utility bills, it is often neglected and remains on the backburner for many building owners, managers, and operators. Without benchmarking, building owners and managers likely miss out on the benefits earned through energy use reduction. Benchmarking can be eye-opening because it demonstrates how efficient—or inefficient—buildings perform relative to similar buildings. Benchmarking helps to establish performance baselines, set goals, track progress, promote energy accounting, quantify and validate energy savings, and identify buildings that should be prioritized. Perhaps most importantly, it also empowers owners to take action to lower their properties' energy consumption. (Hart, 2015)

2.1 Reduce operating expenses

The largest variable operating expenses of a business are its utilities, and energy represents 30 percent of those expenses (MD DEP, 2014; Hurley, 2020). Energy savings achieved from actively addressing benchmarking results will translate into lower utility bills, which is one of the most direct benefits that can be immediately realized. Energy costs are reduced by an average of 2.4 percent each year from benchmarking (SWEET, 2020).

The difference of energy use between the lowest- and highest-efficiency buildings (for identical building uses) is significant, at 300–700 percent. (IMT, 2015)

2.2 Create a strong market for energy efficiency

Another goal of benchmarking is to establish a robust market for energy efficiency in real estate by giving incentive for improvement. Without the information gained from benchmarking, efficiency is not easily factored into how investors, tenants, lenders, and consumers value a property; consumers cannot differentiate between an efficient and inefficient building—much like purchasing a car without knowing its miles-per-gallon. (Hart, 2015). When a building's energy performance is visible to owners and the public, it becomes a marketable feature with economic power by rewarding owners of efficient buildings and prompting others to make investments in energy efficiency. Knowing building energy performance can motivate more owners and managers to take action, which will drive up the demand for energy efficiency and transform the market. (Hart, 2015; IMT, 2015)

This transformation represents a “\$279 billion investment opportunity, returning \$1 trillion in energy savings and creating a cumulative 3.3 million jobs over 10 years” nationally (IMT, 2015, p. 16).

2.3 Increase property value

Demonstrated energy efficiency can be featured alongside other property traits and can increase a building's value, with a corresponding increase in property tax revenues, a 25 percent higher sale prices, 10 percent higher rental premiums for both commercial and residential tenants, and 10 percent fuller occupancy with low turnover rates. (IMT, 2014; Hart, 2015; USDOE, 2013).

2.4 Create jobs

Widespread investment in building performance generates demand for local, high-skilled jobs such as auditors, engineers, architects, construction workers, installers, and retrofitters (Hurley, 2020). For every \$1 million invested in building efficiency, 5 to 15 jobs are created (USDOE, 2013). Additionally, when businesses have leftover savings that might normally be diverted to operating expenses, they can instead go toward hiring additional staff.

2.5 Enhance the local economy

Efficiency-related jobs tend to be local, and the resulting economic activity from energy efficiency investments is typically more varied and expansive than other sectors. For every dollar spent on energy efficiency, \$2.23 is generated for the local economy (Meres et al., 2012). In Philadelphia, according to benchmarking data, 77 percent of commercial buildings need energy upgrades. Retrofitting these buildings with energy efficiency measures would generate more than \$600 million in local spending and support 23,000 jobs. (IMT, 2015)

2.6 Improve organizational efficiency and accountability

Benchmarking and transparency policies can help state and local governments as well as businesses gain a fuller understanding of their building stock, facilitating efficient resource allocation (Hart, 2015). For example, before benchmarking, newer buildings were assumed to be more efficient than older buildings; however, after its first run of benchmarking, New York City found that pre-1930 buildings used less energy than those built after 1990. (The City of New York, 2012; Hart, 2015)

Knowing which buildings use the most energy can provide the basis for devising a targeted energy management plan to reduce costs, demonstrate progress toward meeting efficiency goals, and increase accountability and show responsible spending of taxpayer dollars or business investment. A business that uses more energy than necessary to produce its goods and services is not operating as productively as it could; therefore, moving to a high-performing building enhances the overall business activity. (SWEET, 2020)

2.7 Improve public health and productivity

Improved lighting, ventilation, filtration, and temperature control can increase employee productivity and reduce health-related costs; specifically, better air quality significantly reduces fine particle pollution and the number of asthma-related incidents.

2.8 Inform policy decisions

Policymakers can use benchmarking data to tailor policy and program development per jurisdiction, including efficiency goals, building types to focus on, resource allocation, and further enhancements to adopted energy codes.

2.9 Lower risk to lenders

Thanks to the dollar savings from energy efficiency, those with high-performing buildings are 20 percent less likely to default on loans. Energy-efficient buildings also offer protection against changing consumer preferences and future energy price hikes or local ordinances (An and Pivo, 2015).

2.10 Improve effectiveness of utility efficiency programs

Benchmarking data can arm utilities with the information they need to target customers who would benefit the most from efficiency programs. Utilities can craft programs that address specific issues they identify through benchmarking, making their outreach efforts more effective and streamlined. (Hart, 2015; IMT, 2015)

3. BENCHMARKING IN WEST VIRGINIA

West Virginia boasts a range of resources and initiatives to help businesses, building owners and operators, and taxpayers save energy and money while promoting a robust market. In addition to the various programs the WVOE provides, the state recently passed a bill focused on energy benchmarking, which Charleston has since used as a model for its new energy benchmarking ordinance.

3.1 Energy Efficient West Virginia benchmarking support

Energy Efficient West Virginia (EEWV) and partners at the Northeast Energy Efficiency Partnership (NEEP) have experience crafting and enacting local energy savings policies. EEWV and NEEP can help craft a policy that is responsive to the needs and goals of the local government in order to maximize savings and efficacy of any benchmarking or energy-saving program. Whether it is an ordinance or resolution that is desired, the policy needs to be sound and have protections for the local government.

3.2 West Virginia Office of Energy benchmarking support

The WVOE is one of 56 energy offices across the 50 states, the District of Columbia, and five territories (American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and the Virgin Islands). WVOE offers:

Energy Efficiency Impact Grant Program. The program was launched in June 2020 to ease the economic impacts of COVID-19 on West Virginia's small businesses. In partnership with the Jackson County Development Authority, the WVOE uses the Energy Efficiency Impact Grant Program to help small businesses reduce energy use and save money. Since its inception, the program has helped more than 50 small businesses. Recipients are awarded a one-time grant of up to \$3,000 with no repayment required; funds may be spent on items from a list of qualifying upgrades, including energy-efficient lighting, insulation, weather sealing, HVAC upgrades, and the purchase and installation of ENERGY STAR appliances/products. WVOE benchmarks energy use via ENERGY STAR's Portfolio Manager, providing a pre-project baseline to track energy savings after project completion.

Eligible businesses must be registered in West Virginia and in good standing on or before May 1, 2019, have a physical location, have 15 or fewer employees, generate \$1 million or less in profits, and meet several other criteria.

- Visit energywv.org/index.php?p=ww-energy-efficiency-impact-grant

Commercial and industrial energy efficiency technical assistance and energy assessments. The WVOE and West Virginia University Statler School of Engineering have teamed up to provide free technical assistance and energy assessment services to local governments and municipalities, small and large businesses, nonprofits, manufacturers, school districts, and other entities in order to reduce their energy usage while improving productivity. In performing these services, engineering students also gain valuable practical experience. Over the past five years, the collaborative program has trained more than 350 students (with many receiving jobs offers as a direct result of their energy training), conducted over 200 technical assistance efforts and energy assessments, and have generated more than 10,000,000 kWh, 60,000 MMBtu and \$650,000 in energy and cost savings to West Virginia businesses.

Energy assessments. Assessments can be conducted for small and large businesses, municipalities, nonprofits, schools, and state agencies, as well as resiliency, cybersecurity, and carbon footprint studies.

Technical assistance. Assistance is provided for local governments and municipalities wishing to adopt and enforce energy use management and energy code ordinances, as well as strategic planning for adopting energy reduction goals. Technical assistance for solar energy, residential energy efficiency, and alternative fuels and vehicles is also offered.

Commercial energy conservation, workforce development, and code training programs. Various seminars and workshops are hosted to train architects, engineers, and code officials on how to meet the demands of West Virginia’s adopted commercial energy code. The programs also provide training on how to design and operate a net-zero commercial building as well as other relevant energy efficiency and conservation practices.

For additional information on these programs or to discuss what the WVOE can do for you and your organization, visit energywv.org/wv-energy-profile/energy-efficiency for more resources or contact:

- Karen Lasure, energy development specialist, at karen.r.lasure@wv.gov
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3.3 House Bill 2667

West Virginia is working to transform itself into a robust market for energy efficiency and resilience. In 2021, House Bill (H.B.) 2667 was approved and enacted, which entails:

- “implementing an energy savings program for assessment and implementation of energy savings goals for state buildings;
- requiring energy-savings contracts to include provisions relating to energy cost savings guarantees and deficiency payments;
- providing for the auditing and potential removal of energy metering devices installed at state buildings;
- establishing a Guaranteed Energy Savings Performance Contracting program within the Office of Energy for state buildings; and
- establishing benchmarking and energy efficiency goals for state buildings” (H.B. 2667, p. 1).

Each element of the legislation acts to promote cost savings for state taxpayers while cultivating a greater incentive and demand for energy-saving measures and practices in public buildings. These components are discussed in further detail below. Read the full legislation in Appendix B.

3.3.1 Guaranteed Energy Savings Performance Contracting

The required energy savings contracts are intended to reduce operating costs of state-owned buildings by entering into these performance-based contracts with providers of energy-conservation measures. The contracts will include guarantees of a minimum of 20 percent of costs saved yearly, a statement of all costs of the measures taken, provision of payments to be made, and other contingencies. Interested firms must submit proposals detailing the scope of work to be completed.

3.3.2 West Virginia Office of Energy

To best serve West Virginia and its growing collection of energy initiatives, policies, and development plans, the former Division of Energy will be designated as the Office of Energy and organized within the Department of Economic Development. This streamlining effort will

- “provide leadership for developing energy policies emphasizing the increased efficiency of energy use,
- the increased development and production of new and existing domestic energy sources,
- the increased awareness of energy use on the environment and the economy,
- dependable, efficient, and economical statewide energy systems capable of supporting the needs of the state
- increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased,
- reduce the ratio of energy consumption to economic activity and maintain low-cost energy,” and “provide direction for the private sector” (H.B. 2667, p. 4).

The legislation also provides that the office will work with the public regarding proposed energy policies and development plans, create an energy use database, collaborate with West Virginian universities and colleges, private industry, and nonprofit organizations in energy research and resource development, and other energy use and efficiency–related initiatives.

3.3.3 Energy Savings Contracting Program

An energy savings contracting program will develop model, standardized contracts, guidelines, procedures, manuals and other documents for use in the energy-savings agreements with bidding firms.

3.3.4 Energy savings program

Significantly, the legislation implements mandatory energy usage reduction goals—a reduction of 25 percent below 2018 levels by 2030—for “electricity, natural gas, fuel oil, and steam in all state buildings under the care, custody, and control of the state” (H.B. 2667, p. 7). Annual reports on energy-conservation progress and measures taken will be submitted to the Legislature. The legislation also stipulates that energy-saving contracts must be annually audited by an independent party, which will include a comparative analysis of anticipated versus actual energy savings.

3.3.5 Disclosure of energy usage

In line with transparency policies often coupled with energy benchmarking, the legislation requires the establishment of a program for measuring and benchmarking energy usage of all state buildings using EPA’s ENERGY STAR Portfolio Manager. Energy usage data will be submitted annually, and the resulting report on state buildings’ energy performance will be submitted annually to the Legislature. (H.B. 2667)

4. BENCHMARKING STEPS

4.1 Enact a policy framework

Benchmarking and the ultimate result of saving energy are long-term endeavors, so having a written policy framework in place will help guide the actions of government employees, particularly as personnel and understandings change over time. Local governments have a variety of options for establishing a policy, but the most common choice is whether a local legislative body (such as a council or commission) wishes to enact an ordinance or a resolution. While a resolution can also give clarity and guidance for implementation, local governments are advised to enact ordinances if the city intends to make commitments beyond the current term of the mayor or chair. By having a written ordinance in the local code, the government makes it clear that it intends for this project to continue long term. While a local government is free to begin benchmarking without anything in writing, the transparency and consistency afforded by a publicly available document helps improve the chances of success.

4.2 Measurement

Benchmarking is the process of consistently and uniformly measuring the energy performance of a building over time, especially in relation to similar buildings. Benchmarking results may also be compared against modeled simulations of reference buildings built to a standard, such as an energy code (U.S. DOE, 2020a). Building owners enter basic building characteristics and monthly energy use into tracking software. For example, the U.S. Environmental Protection Agency's ENERGY STAR Portfolio Manager is a popular, no-cost, online program that normalizes energy use by accounting for weather, building type, occupancy, and other factors that affect energy consumption. (Hartz, 2015)

Data access and integrity both underpin the quality of results a benchmarking tool will generate. Utilities play a critical role in ensuring accurate and frequent usage data reports, and often assist building owners in acquiring the needed information. See Chapter 6 for more information on obtaining consumption data.

4.3 Reporting

Reporting on benchmarking activities and outcomes is a great way to demonstrate fiscal responsibility, ensure efficient allocation of resources, and identify problems with building performance that require remedial action. Benchmarking reports provide policymakers and the public with a picture of building stock performance over a period of time. Reporting benchmarking results to the appropriate agency is also required under mandatory building performance standards (BPS), which is distinct but related to benchmarking and requires building owners to meet specific performance targets. By instituting a reporting program, building owners that might otherwise pay no mind to energy efficiency or be aware of its benefits will be prompted to identify ways energy consumption can be improved in their properties. Typically, this performance can be reported in a number of ways:

Cost performance. The cost of building operations over a period of time. Reported in dollars over a period of time.

Fuel performance. Fuel usage of a building over a period of time. For electricity, reported in number of kilowatt-hours used over a period of time. For natural gas, reported in number of cubic feet of gas used over a period of time.

Emissions performance. The direct or indirect emissions associated with building operations. Typically reported in number of metric tons of carbon dioxide equivalents emitted.

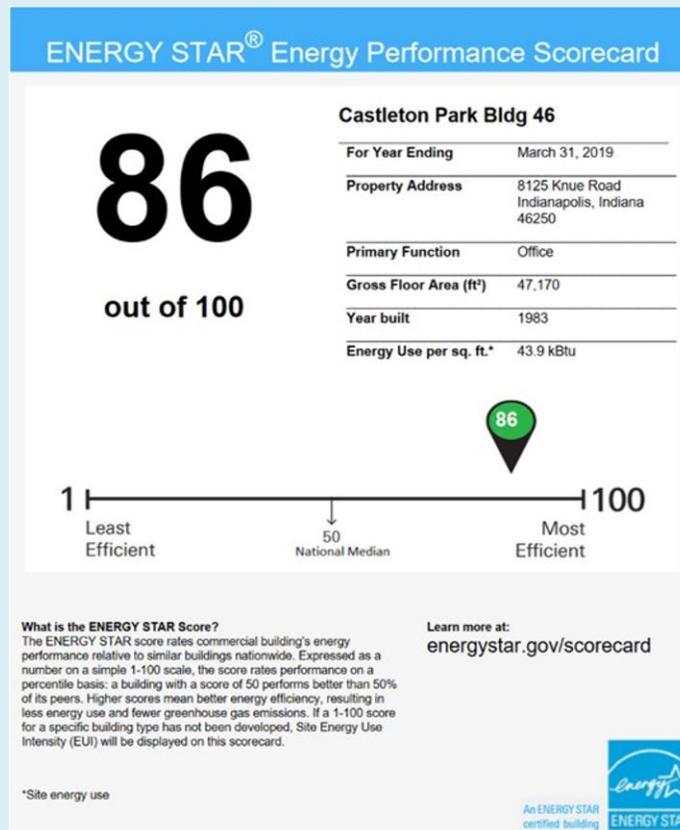
Building performance. An overall grade or score of building performance compared to similar buildings within a defined geography. Typically reported in a 1-100 numeric score.

ENERGY STAR Energy Performance scorecard

One of the outputs of the ENERGY STAR benchmarking system is the scorecard: a snapshot of the analyzed building's energy performance complete with quick reference statistics such as building information, energy use intensity, and final ENERGY STAR score. The score represents how the building performs compared to similar buildings nationwide; for example, a score of 50 means the building performs better than 50 percent of comparable buildings. The pin color also indicates which tier the building falls into:

- Green: 75–100
- Yellow: 26–74
- Red: 0–25

If a building receives the ENERGY STAR certification (meaning it received a score of 75 or better), a blue ENERGY STAR mark will appear.



4.4 Transparency

Transparency is similar to reporting but takes the visibility to a new level in making energy use data available to the public instead of only the reporting agency. Benchmarking policies are so often coupled with transparency policies that benchmarking and transparency (B&T) is its own category and is the typical format for energy benchmarking programs. Combined, B&T policies support energy efficiency programming by raising awareness of energy consumption, identifying opportunities for improvements, spurring research and investment from the private sector, and serving as a tool for governments to make and achieve a variety of goals, from economic to sustainability. Transparency policies specifically are aimed at advancing the market for energy efficiency measures by promoting consumer access to energy usage information, be it for real estate transactions, the residential market, industrial or commercial activities, or other purposes. By making a building's performance visible to the public, more building owners will be encouraged to invest in energy efficiency, driving greater demand for energy efficiency-related jobs. (USEPA, 2021)

5. BENCHMARKING IN ACTION

Charleston, WV. As of the date of publication, Charleston is the first West Virginia city to establish a benchmarking ordinance after the Charleston City Council’s Facilities and Environment and Recycling Committee passed an energy usage bill that was developed by the newly created Charleston Green Team. The ordinance requires energy and water usage of city-associated buildings to be measured by building operators and reported back to the city manager. The city manager will develop an energy savings program by July 1, 2022, which will aim to reduce energy usage in all municipal properties by 25 percent by 2031. The 25 percent goal is based on H.B. 2667, which also passed in 2021 in the state legislature.

Section 2-751, the Purpose of Energy Benchmarking Ordinance, reads:

“The Purpose of this Article and energy benchmarking is to encourage efficient use of municipal energy paid by taxpayers and to reduce municipal pollution. This Article requires Covered Municipal Properties to annually measure and disclose energy usage to the City Manager. Furthermore, this Ordinance will authorize the City Manager to collect energy usage data to enable more effective energy and climate protection planning by the City and others and to provide information to the real estate marketplace to enable its members to make decisions that foster better energy performance” (Bill No. 7916).

The ordinance also requires buildings to be assessed for suitability for solar energy and an audit of city streetlights and energy meters to identify inactive devices. Additionally, private property owners are encouraged to take part in the city benchmarking initiative, though their involvement is voluntary. (Bill No. 7916; Kersey, 2021)

View the full ordinance in Appendix C.

Better Buildings Initiative

The DOE’s Better Buildings Initiative, in which nearly 1,000 businesses, governments, and other entities participate, saved \$13.5 billion in energy costs in the past year. The Better Buildings partners include more than 30 Fortune 100 companies, 12 of the top 25 U.S. employers, 12 percent of U.S. energy manufacturing, 13 percent of total commercial business space, 17 federal agencies, eight national laboratories, and more than 80 states and location governments. The \$13.5 billion savings is thanks to the collaboration of public and private sector agencies that have taken steps to optimize building operations, implement energy-saving measures, consistently benchmark building performance, and develop energy and building resilience policies. In the Better Buildings Initiative’s 2021 annual report and several other resources, a number of local and state governments and other entities were highlighted for their commitment to lead by example in energy savings.

Knoxville, TN. In 2007, Knoxville created a 15-member, public-private Energy and Sustainability Task Force to centralize efforts and organize a work plan for energy efficiency improvements, which then turned into the 2010 Knoxville Energy and Sustainability Work Plan. Its initial goal was to reduce energy intensity by 20 percent by 2020.

Knoxville entered into an energy services performance contract with an energy services company which guaranteed energy savings on the targeted 99 city-owned buildings, 37 athletic fields, and

three public golf courses. Additionally, the city implemented a municipal street lighting update, converting 30,000 lights to low-energy LEDs. Instead of performing piecemeal retrofits over a number of years, Knoxville leveraged the anticipated savings to finance and complete the project, then repay the costs over a 13-year period.

Data tracking used a custom software that incorporated ENERGY STAR Portfolio Manager. The Sustainability Office worked gathered monthly meter consumption data in digital format, and the initial database took one year to populate. The Sustainability Office receives copies of energy bills for city-owned facilities and enters the data into the tracking platform, and all energy use data is organized and readily available.

Ultimately, the 99 facilities were retrofitted between 10 and 30 percent savings with an average decrease of 16 percent, a cumulative reduction of 38 percent, and an annual savings of \$165,000 to taxpayers.

Read more about Knoxville's energy efficiency efforts and view additional resources: betterbuildingssolutioncenter.energy.gov/implementation-models/designing-comprehensive-energy-plan

Maryland. In 2008, Maryland set a 20 percent energy goal reduction for its 9 million square feet of state agency buildings, to be achieved by 2020. The state achieved this decrease ahead of schedule in 2015 with the help of improvements to the energy database, use of Energy Performance Contracts, energy efficiency training for staff, starting a competition between agencies, and setting goals and milestones.

In response to the 2019 Executive Order, "Energy Savings Goals for State Government," Maryland set another goal of an additional 15 percent reduction by 2029 across its expanded building portfolio of 90.7 million square feet, including university campuses.

Currently, Maryland is at 25 percent reduced energy compared to its 2018 baseline.

(USDOE, 2021)

6. ROADMAP

Reach out to the West Virginia Office of Energy

The WVOE is an excellent resource available for any public entity in need of energy efficiency or benchmarking assistance. WVOE officials will attend planning process meetings, assist in technical matters such as energy monitoring and effective upgrades, and even identify viable funding options to pursue. The WVOE provides a range of services to help build a robust market for energy efficiency in the state.

6.1 Develop a benchmarking plan

A clear plan that defines the purpose and goals of the benchmarking program is necessary for a functional and useful system. Jurisdictions can encourage or eventually require benchmarking for privately owned commercial buildings. In its introductory phase, though, a benchmarking program should only apply to state-owned public buildings. This way, West Virginia can establish and refine a feasible program that local governments as well as private entities can seamlessly plug into at an appropriate time.

6.1.1 Establish benchmarking goals

Jurisdictions should first determine specific energy goals to pursue, as most decisions on a jurisdiction's benchmarking strategy will depend on the goals selected. Will buildings be compared to simulations that comply with a particular energy code, other buildings within the same organization, or buildings outside the organization but with similar characteristics? Will a jurisdiction aim to comply with a specific energy policy or other legal requirement?

The goals should also consider the intended audience of the reported data. Transparency policies may make the benchmarking data public, but different stakeholders will be interested in different metrics.

6.1.2 Determine which buildings will be benchmarked

The most common minimum standard for benchmarking policies requires government buildings to be benchmarked. Many municipalities have also added non-residential buildings exceeding a certain square footage, either by requiring them to benchmark or allowing voluntary participation. Some regions also include large residential buildings or buildings from particular industries. A municipality should consider which building types should be covered, whether benchmarking should be mandatory on privately-owned buildings, and which building types may warrant exemptions

6.1.3 Assign a benchmarking team or lead

An individual or team should be assigned as the benchmarking manager, or "lead". The lead should collect all the necessary information from different utility sources and should be comfortable using the portfolio management system, entering data, and ensuring that the correct metrics are analyzed and reported.

6.1.4 Choose a benchmarking tool

Online portfolio management services allow users to input, organize, and keep track of all the data needed for complying with efficiency standards. While various benchmarking tools and portfolio

managers are available, more than half of Fortune 100 companies and one-quarter of commercial buildings nationwide rely on EPA’s free-to-use platform, ENERGY STAR Portfolio Manager, which is largely considered the industry standard in benchmarking.

The ENERGY STAR Portfolio Manager is both a management tool and a metrics calculator and contains all the information and analyses needed to conduct a benchmark; it also has an abundance of educational tools and resources available that make it very user-friendly. Virtually any building type can be benchmarked through the program.

The West Virginia Office of Energy provides startup assistance to any entity that requests help, and Portfolio Manager offers many helpful resources for getting started:
energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/get-started-benchmarking.

ENERGY STAR Portfolio Manager

- saved businesses and organizations nearly \$10 billion for commercial buildings and \$1.4 billion for industrial buildings in 2016, and over \$150 billion since 1992
- saves 35 percent more energy in ENERGY STAR–certified buildings than typical buildings
- was used by 32 local governments, three states, one Canadian province, 33 industrial sectors, and 260,000 buildings in 2019 (EPA, 2020)

6.2 Identify the data and metrics needed

A minimum of 12 months of data is needed to develop the preliminary baseline and reference point for analysis, as this ensures the data are normalized to account for natural variations and weather conditions. The ENERGY STAR Portfolio Manager Data Collection Worksheet facilitates data entry by automatically filtering input data fields according to property type, location, and desired outputs: portfoliomanager.energystar.gov/pm/dataCollectionWorksheet.

6.2.1 Input

The designated individual or team enters basic data for each property and property type into the benchmarking tool. If using the ENERGY STAR Portfolio Manager, data can be uploaded manually, with spreadsheet templates, or using web services. Some inputs are required by the benchmarking tool, some will be needed to obtain certain desired output metrics, and others will be helpful in decision-making processes.

To help acquire the information needed, leads should identify data availability, access, location, and delivery mode within the organization and should inventory all energy purchased and generated on-site (e.g., electricity, gas, steam, waste fuels) in physical units (e.g., kWh, MMBtu, Mcf, Therm, CCF, lbs of steam). (US EPA, 2013)

Typical data include:

- **Building information:** gross square footage, percentage of area that is heated or cooled, primary function, location, year built, property type, number and type of rooms or annexes.
- **Consumption data:** property-specific utility bills for energy purchased or generated on-site, including electricity, natural gas, and steam and chilled water.

- **Operating characteristics:** operating hours, number of computers or other high-energy devices or systems, number of employees or occupancy.

6.2.2 Output

The outputs are the desired indicators for tracking energy use; depending on the goals chosen, policy, legal requirements, and intended audience, the data desired outputs may vary. Commonly used outputs include:

- **Energy use intensity (EUI):** EUI will be the primary output of interest and indicates how much energy a property is consuming relative to its size, based on the total raw fuel required and consumed for operation per production or footprint and adjusted for weather (e.g., Btu per square foot, per employee, per unit of product). EUI is the apples-to-apples comparison akin to a “miles-per-gallon” measurement for a building. Learn more about EUI: energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/understand-metrics/what-energy
- **Gross consumption:** Gross consumption measures the building’s total energy use and is used for tracking energy use reductions (usually in Btu).
- **Electricity demand:** Electricity demand is typically measured in kW. Electricity itself is measured in kWh, whereas the demand charge present in a utility bill is measured in kW.
- **Energy cost intensity:** The energy cost intensity is the cost each year of energy used per square foot of the property.
- **ENERGY STAR Score:** This is a 1-100 score assigned to a building’s results, which indicates how energy-efficient it is compared to a national sample of similar buildings. These scores are not stagnant and can be improved; high scores can earn the ENERGY STAR certification. The ENERGY STAR certification is a trusted standard and the only energy efficiency certification based on verified, data-based energy performance, making it stand out to clients, partners, buyers, and lessees. The certification is acknowledged by many utilities and other private and public organizations and is awarded with discounts, tax exemptions, rebates, incentives, elevated property values, and higher transaction premiums for property owners. The ENERGY STAR Score is widely recognized and understood by a wide range of stakeholders, making it an effective cumulative indicator of a building’s performance. (EPA, 2013; EPA, 2019) Learn more about the ENERGY STAR score and certification benefits:
 - energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/interpret-your-results/what
 - energystar.gov/buildings/facility-owners-and-managers/existing-buildings/learn-benefits/value-energy-star-certification

6.3 Data collection considerations

6.3.1 Collection method

Benchmarking leads have multiple ways to collect and aggregate data, but the method chosen should be informed by how the data are managed, how the organization is structured, and staffing concerns. Two common collection methods are:

- **Centralized:** one, central account in a benchmarking tool stores all the facility data.

- **Decentralized:** multiple accounts are managed by multiple coordinators, often related to a department or facility; all data from the separate accounts are then shared with the central database and managed by a master account.

6.3.2 Frequency

Leads should consider which collection frequency is both feasible and informative enough for analysis. As stated, a full 12 months of data are required to calculate any output metrics. Some frequency options include:

- **Interval:** monitors energy use at short intervals, often every 15 minutes, which provides the most data and is useful for time-of-use analysis.
- **Monthly:** monitors monthly energy use through meter data, which allows weather and operating adjustments to be made.
- **Seasonal:** monitors energy use for each heating and cooling season, which is useful for seasonal comparisons.
- **Yearly:** monitors annual energy use, which can be helpful for annual planning and prioritizing, program assessment, and year-by-year comparisons.

6.3.3 Level of detail

The granularity of the data collected will depend on the needs of the benchmarking results as well as data availability and staff capacity. Some common levels of data collection include:

- **System:** monitors energy use of individual pieces of equipment or building systems; allows the finest level of detail and the most control.
- **Facility:** monitors energy use of an entire building; useful for assessing progress and prioritizing low-performing buildings within an organization.
- **Account:** monitors energy use of multiple buildings connected to a single meter.
- **Sub-group:** high-level monitoring of energy use of multiple buildings by grouping multiple meters or accounts.
- **Portfolio:** highest-level monitoring of energy use of all buildings in a single organization's portfolio, which produces an aggregate picture of an organization's overall energy efficiency on feasibility and value.

6.3.4 Standardization

Data collection and analysis will be greatly streamlined if naming protocols, units, and data collection methods are standardized across all buildings, facilities, and/or organizations.

6.3.5 Verification

Data verification ensures that the outputs calculated are as accurate as possible, which is essential to capturing the financial benefits of benchmarking, tracking efficiency goals, and reporting transparency. Leads should establish a consistent quality assurance/quality control system, which can include actions such as random sampling of meter data, checking unusually low or high performance ratings, and double-checking facility information. (EPA, 2013)

6.4 Analysis and interpretation

The core of benchmarking and what drives decisions is the analysis and interpretation of the outputs generated from the calculations. Depending on the desired reports, granularity of data collected, and other factors, different analyses will be available.

Portfolio Manager allows users to compare:

- to a national sample of similar buildings,
- current energy use to baseline and historical use of the same building over time,
- different properties within the same portfolio against each other,
- department-wide energy consumption to identify the best candidates for efficiency measures, and
- to a simulated reference building built to a specific standard (such as an energy code) to compare current performance with potential performance.

6.5 Reporting

Building owners can send reports with the required metrics directly to the reporting agency, which will differ depending on the what the local jurisdiction mandates. Specific outputs from the analysis can be summarized in Portfolio Manager reports to capture the complete picture of a building's or organization's energy efficiency. The required reporting outputs should be clearly outlined in the policy.

ENERGY STAR Portfolio Manager includes a number of standard reports.

Additional information that can be reported, especially if it is relevant to the intended audience, includes job impacts, energy savings, energy costs savings, renewable energy capacity and generation, emission reductions, and process metrics (e.g., number of buildings retrofitted, square footage, measures purchased).

6.6 Raise awareness and provide education for private buildings.

Because widespread and effective benchmarking by privately owned buildings requires the cooperation and participation of building owners and managers, the benchmarking authority should ensure that participants can quickly and easily understand the requirements and the process for submitting a benchmarking report.

The jurisdiction should direct users to a step-by-step guide for complying with the benchmarking ordinance, including details such as the deadline for reporting, whether a building must benchmark or not, how to set up a free Energy Star Portfolio Manager account, and how to add properties to the portfolio. Additionally, details on the data disclosure required (and any limiting options the owner has) per the transparency policies should be made clear to the user. Training opportunities should be provided and encouraged to interested staff, such as the Building Operator Certification.

Ideally, the jurisdiction should create a benchmarking webpage or a resource center for privately owned buildings that functions as an easy-to-navigate database with all necessary information and frequently asked questions.

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APPENDIX A: SAMPLE BENCHMARKING COMPLIANCE CHECKLIST

While benchmarking requirements vary by jurisdiction, the same basic steps can be followed to start benchmarking.

Get started

1. Assign a benchmarking lead or team, who will be the primary user and data collector for Portfolio Manager.
2. Determine whether you must comply: list of building characteristics that warrant benchmarking (square footage, building type...)
 - a. Complete an exemption form ([link](#)) if applicable.

Set up your account

3. Create a Portfolio Manager Account or log in to an existing account:
<https://portfoliomanager.energystar.gov/pm/signup>
 - a. Obtain your unique building identifier number ([link](#))
4. Add properties to Portfolio Manager. This step requires basic building characteristics, such as gross floor area, building type and use, space attributes, occupancy, operating hours, and any other information that pertains to the selected building type.
https://www.energystar.gov/sites/default/files/tools/US_PropertyTypesUseDetails_Definitions_Final_KAB508c.pdf

Collect data

5. Request whole-building energy data from electricity and natural gas providers ([links](#)).
 - a. Alternatively, enter monthly energy use data directly from utility bills.
6. If available, sign up for automatic utility data using the Portfolio Manager account information and meter numbers, found on utility bills.

Enter data

7. Update any preexisting information necessary for the reporting year.
8. Ensure all requested building and property use information is complete, including unique identifiers.
9. Enter all required energy use data for all fuel types used. (Energy > Add Another Meter)
10. Run the data quality check and resolve any potential issues.
 - a. If required, have data professionally verified.
11. Add verification information to the property's profile.

Report results

12. Reporting agencies typically have specific deadlines and formats submitters must adhere to, so check local policy requirements to ensure all required information is reported in time.
 - a. Municipalities will often have a website to go to enter and submit certain details or the whole report generated by Portfolio Manager. If permitted, reports can also be submitted to the municipality through Portfolio Manager, though these are distinct systems.

(City of Chicago, 2016; Montgomery County, MD, 2014)

APPENDIX B: HOUSE BILL 2667

WEST VIRGINIA LEGISLATURE

2021 REGULAR SESSION

ENROLLED

Committee Substitute

for

House Bill 2667

BY DELEGATES RILEY, HANSEN, QUEEN, HANNA, SKAFF, STEELE,

HARDY, CLARK, CRISS, CAPITO AND REYNOLDS

[Passed April 10, 2021; in effect ninety days from passage.]

1 AN ACT to amend and reenact §5A-3B-2 and §5B-2F-2 of the Code of West Virginia, 1931, as
2 amended; and to amend said code by adding thereto three new sections, designated §5B-
3 2F-3, §5B-2F-4 and §5B-2F-5, all relating to promoting cost savings for state taxpayers by
4 implementing an energy savings program for assessment and implementation of energy
5 savings goals for state buildings; requiring energy-savings contracts to include provisions
6 relating to energy cost savings guarantees and deficiency payments; providing for the
7 auditing and potential removal of energy metering devices installed at state buildings;
8 establishing an energy savings program and contracting program within Division of Energy
9 for state buildings; and establishing benchmarking and energy efficiency goals for state
10 buildings.

Be it enacted by the Legislature of West Virginia:

CHAPTER 5A. DEPARTMENT OF ADMINISTRATION.

ARTICLE 3B. ENERGY-SAVINGS CONTRACTS.

§5A-3B-2. Energy-savings contracts.

1 (a) Agencies are authorized to enter into performance-based contracts with qualified
2 providers of energy-conservation measures for the purpose of significantly reducing energy
3 operating costs of agency owned buildings, subject to the requirements of this section.

4 (b) Before entering into a contract or before the installation of equipment, modifications or
5 remodeling to be furnished under a contract, the qualified provider shall first issue a proposal
6 summarizing the scope of work to be performed. A proposal must contain estimates of all costs
7 of installation, modifications or remodeling, including the costs of design, engineering, installation,
8 maintenance, repairs or debt service, as well as estimates of the amounts by which energy
9 operating costs will be reduced. If the agency finds, after receiving the proposal, that the proposal
10 includes one or more energy-conservation measures, the installation of which is guaranteed to
11 result in a net savings of a minimum of five percent of the then current energy operating costs

12 which savings will, at a minimum, satisfy any debt service required, the agency may enter into a
13 contract with the provider pursuant to this section.

14 (c) An energy-savings contract must include the following:

15 (1) A guarantee of a specific minimum net percentage amount of at least five percent of
16 energy operating costs each year over the term of the contract that the agency will save;

17 (2) A statement of all costs of energy-conservation measures, including the costs of
18 design, engineering, installation, maintenance, repairs and operations; and

19 (3) A provision that payments, except obligations upon termination of the contract before
20 its expiration, are to be made over time.

21 (4) A provision relating to guaranteed energy cost savings and payments due the State
22 for any deficiency, in a form substantially similar to the following: In the event the energy and cost
23 savings achieved during a guarantee year are less than the guaranteed energy cost savings for
24 that year, the qualified provider shall pay the agency an amount equal to the deficiency. In no
25 event shall a qualified provider use credit for excess savings to satisfy saving guarantees in future
26 years of the contract. Savings achieved by the installed projects must comply with requirements
27 contained in this section and sufficiently cover all project costs, including, as applicable, debt
28 service and contractor fees, maintenance, monitoring, and other services, for the duration of the
29 contract term. If a project does not generate the guaranteed level of savings in any predefined
30 reconciliation term, the qualified provider is liable to the agency for the amount of the shortfall plus
31 related costs.

32 (d) An agency may supplement its payments with federal, state or local funds to reduce
33 the annual cost or to lower the initial amount to be financed.

34 (e) An energy-savings contract is subject to competitive bidding requirements and other
35 requirements of article three of this chapter.

36 (f) An energy-savings contract may extend beyond the fiscal year in which it first becomes
37 effective: *Provided*, That such a contract may not exceed a fifteen-year term: *Provided, however*,

38 That the long term contract will be void unless the agreement provides that the agency shall have
39 the option during each fiscal year of the contract to terminate the agreement.

40 (g) Agencies may enter into a “lease with an option to purchase” contract for the purchase
41 and installation of energy-conservation measures if the term of the lease does not exceed fifteen
42 years and the lease contract includes the provisions contained in subsection (f) of this section
43 and meets federal tax requirements for tax-exempt municipal leasing or long-term financing.

44 (h) The agency may include in its annual budget for each fiscal year any amounts payable
45 under long-term energy-savings contracts during that fiscal year.

46 (i) Upon the issuance of a request for proposals or request for quotations for an energy-
47 savings contract, the agency shall provide a copy thereof to the Joint Committee on Government
48 and Finance.

49 (j) Before signing an energy-savings contract or extending an existing energy-savings
50 contract, the agency shall give thirty days’ written notice, which notice shall include a copy of the
51 proposal containing the information required by subsection (b) of this section, to the Joint
52 Committee on Government and Finance.

CHAPTER 5B. ECONOMIC DEVELOPMENT ACT OF 1985.

ARTICLE 2F. DIVISION OF ENERGY.

§5B-2F-2. Purpose; Office of Energy; office to develop energy policy and development plan; contents of energy policy and development plan; and office to promote energy initiatives.

1 (a) Effective July 1, 2017, the Division of Energy is hereby continued, but shall be
2 designated and known as the Office of Energy and shall be organized within the Department of
3 Economic Development. All references throughout this code to the Division of Energy shall be
4 construed to refer to the Office of Energy. The office may receive federal funds.

5 (b) The office is intended to provide leadership for developing energy policies emphasizing
6 the increased efficiency of energy use, the increased development and production of new and
7 existing domestic energy sources, the increased awareness of energy use on the environment
8 and the economy, dependable, efficient and economical statewide energy systems capable of
9 supporting the needs of the state, increased energy self-sufficiency where the ratio of indigenous
10 to imported energy use is increased, reduce the ratio energy consumption to economic activity
11 and maintain low-cost energy. The energy policies and development plans shall also provide
12 direction for the private sector.

13 (c) The office shall have authority over the energy efficiency program existing under the
14 Department of Economic Development.

15 (d) The office shall develop an energy policy and shall report the same back to the
16 Governor and the Joint Committee on Government and Finance before December 1, 2007. The
17 energy policy shall be a five-year plan setting forth the state's energy policies and shall provide a
18 direction for the private sector. Prior to the expiration of the energy policy, the office shall begin
19 review of the policy and submit a revised energy policy to the Governor and the Joint Committee
20 on Government and Finance six months before the expiration of the policy.

21 (e) The office shall prepare and submit an annual energy development plan to the
22 Governor and the Joint Committee on Government and Finance on or before December 1 of each
23 year. The development plan shall relate to the office's implementation of the energy policy and
24 the activities of the office during the previous year. The development plan shall include any
25 recommended legislation. The Public Energy Authority, the Office of Coalfield Community
26 Development, the energy efficiency program, the Department of Environmental Protection and
27 the Public Service Commission, in addition to their other duties prescribed by this code, shall
28 assist the office in the development of an energy policy and related development plans. The
29 energy development plan shall set forth the plans for implementing the state's energy policy and
30 shall provide a direction for the private sector. The energy development plan shall recognize the

31 powers of the Public Energy Authority as to development and financing of projects under its
32 jurisdiction and shall make such recommendations as are reasonable and practicable for the
33 exercise of such powers.

34 (f) The office shall hold public hearings and meetings with notice to receive public input
35 regarding proposed energy policies and development plans. The energy policy and development
36 plans required by subsections (d) and (e) of this section shall address increased efficiency of
37 energy use, traditional and alternative energy, water as a resource and a component of energy
38 production, energy distribution systems, the siting of energy facilities, the increased development
39 and production of new and existing domestic energy sources, increased awareness of energy use
40 on the environment and the economy, energy infrastructure, the development and implementation
41 of renewable, clean, technically innovative and advanced energy projects in this state. Projects
42 may include, without limitation, solar and wind energy, low-impact hydro power, geothermal,
43 biomass, landfill gas, fuel cells, renewable hydrogen fuel technologies, waste coal, coal mine
44 methane, coal gasification to ultraclean fuels, solid waste to fuel grade ethanol and coal
45 liquefaction technologies.

46 (g) The office may propose rules for legislative approval in accordance with the provisions
47 of article three, chapter twenty-nine-a of this code designed to implement an energy policy and
48 development plan in accordance with the provisions of this chapter.

49 (h) The energy policy and development plans required by subsections (d) and (e) of this
50 section shall identify and report on the energy infrastructure in this state and include without
51 limitation energy infrastructure related to protecting the state's essential data, information systems
52 and critical government services in times of emergency, inoperativeness or disaster. In
53 consultation with the Director of the Division of Homeland Security and Emergency Management,
54 the office shall encourage the development of energy infrastructure and strategic resources that
55 will ensure the continuity of governmental operations in situations of emergency, inoperativeness
56 or disaster.

57 (i) In preparing or revising the energy policy and development plan, the office may rely
58 upon internal staff reports or the advice of outside advisors or consultants and may procure such
59 services with the consent of the Secretary of Economic Development. The office may also involve
60 national, state and local government leadership and energy experts.

61 (j) The office shall prepare an energy use database, including without limitation, end-use
62 applications and infrastructure needs for different classes of energy users including residential,
63 commercial and industrial users, data regarding the interdependencies and sources of electricity,
64 oil, coal, water and gas infrastructure, data regarding energy use of schools and state-owned
65 facilities and collect data on the impact of the energy policy and development plan on the
66 decisions and strategies of energy users of the state.

67 (k) The office shall promote collaboration between the state's universities and colleges,
68 private industry and nonprofit organizations to encourage energy research and leverage available
69 federal energy research and development resources.

70 (l) The office shall promote initiatives to enhance the nation's energy security through
71 research and development directed at transforming the state's energy resources into the
72 resources that fuel the nation.

73 (m) The office shall work with the President of the United States and his or her
74 administration to develop a plan that would allow West Virginia to become the leader in
75 transitioning the United States to a new energy future.

76 (n) The office is to determine the best way for West Virginia to utilize its resources and
77 any federal funding to develop the technologies that are necessary for such a transition.

78 (o) The office is to clearly articulate West Virginia's position on an energy solution for the
79 United States that encompasses clean coal, natural gas, transtech energy technologies and
80 renewable energy technologies.

81 (p) The office shall develop and distribute an informational program and policies that
82 emphasize the importance of West Virginia energy resources and their positive impact on the
83 eastern seaboard and the nation.

84 (q) The office shall monitor legal challenges to the energy industries in the state and submit
85 a report quarterly to the Joint Committee on Government and Finance. The report shall contain
86 information relating to any litigation that challenges any statute that could affect the production,
87 distribution and utilization of natural resources of the state.

88 (r) The office shall develop and administer a program for auditing the energy metering
89 devices for both electricity and natural gas currently installed at state buildings for purposes of
90 determining whether such devices are active or inactive. Such program shall be designed to audit
91 no fewer than 20 percent (20%) of the energy metering devices each year to enable completion
92 of the audit of all such devices no later than January 1, 2027. In the event the office determines
93 during such audit that an energy metering device is no longer active, it shall notify the energy
94 service provider to request (1) removal of such device and (2) adjustment of utility bills
95 prospectively to remove any charge associated with such meter.

§5B-2F-3. Energy Savings Contracting Program.

1 The secretary shall, working with such other agencies of the state as the secretary deems
2 appropriate, establish an energy savings contracting program to support the design and
3 installation of energy-savings contracts that may be entered into by agencies of the state under
4 §5A-3B-1 *et seq.* of the code. Such program shall include the development and provision of
5 model, template, or standardized contracts, guidelines, procedures, manuals, and other related
6 documents regarding the use of energy-savings contracts.

§5B-2F-4. Energy savings program.

1 (a) No later than October 1, 2021, the secretary shall establish an energy savings program
2 designed to reduce energy usage for electricity, natural gas, fuel oil, and steam in all state
3 buildings under the care, custody, and control of the state by 25% below 2018 levels by 2030.

4 The secretary shall report annually to the Legislature regarding the energy-conservation
5 measures, as defined by §5A-3B-1(b) of this code, installed under the energy savings program,
6 achieved reductions in energy usage, and additional energy-conservation measures, if any,
7 necessary to achieve the required reductions by 2030. The secretary is authorized to enter into
8 energy-savings contracts as defined in §5A-3B-1 *et seq.* of this code, as necessary, to implement
9 the energy savings program. Energy-savings contracts entered into as part of the energy savings
10 program shall require an annual energy audit performed by a third party and at the cost of the
11 qualified provider. Energy audits shall include (1) A comparative analysis of anticipated to actual
12 energy savings; and (2) the terms and conditions of agency payment and performance
13 guarantees. Any such performance guarantees shall provide that the contractor is responsible for
14 maintenance and repair services for any energy related equipment, including computer software.

15 (b) The department will collaborate with the Department of Administration to develop
16 energy saving strategies and improve energy efficiency in state buildings under the control and
17 care of the Department of Administration.

§5B-2F-5. Disclosure of energy usage.

1 No later than July 1, 2021, the secretary shall establish a program for measuring and
2 benchmarking the energy, including electricity, natural gas, fuel oil, and steam, efficiency of all
3 state buildings under custody and control of the state. Such program shall use the benchmarking
4 tool Energy Star Portfolio Manager® operated by the United States Environmental Protection
5 Agency. No later than October 1, 2021 and each year thereafter, the secretary shall compile and
6 submit energy usage data for all state buildings to such benchmarking tool. The secretary shall
7 report annually to the Legislature regarding the building energy performance compared to similar
8 buildings in similar climates, as determined by the Energy Star Portfolio Manager®.

The Joint Committee on Enrolled Bills hereby certifies that the foregoing bill is correctly enrolled.

.....
Chairman, House Committee

.....
Chairman, Senate Committee

Originating in the House.

In effect ninety days from passage.

.....
Clerk of the House of Delegates

.....
Clerk of the Senate

.....
Speaker of the House of Delegates

.....
President of the Senate

The within this the.....
day of, 2021.

.....
Governor

APPENDIX C: BILL NO. 7916; CHARLESTON ORDINANCE ON ENERGY BENCHMARKING (AS INTRODUCED)

Bill No. 7916

Introduced in Council:

July 6, 2021

Introduced by:

Jennifer Pharr and John Kennedy Bailey

Adopted by Council:

Referred to:

**Facilities and Environment
& Recycling Committees**

1 **Bill No. 7916** - A BILL to amend the Municipal Code of the City of Charleston, as
2 amended, by adding thereto a new Article, designated Article IX within Chapter 2,
3 consisting of Sections 2-751, 2-752, 2-753, 2-754, 2-755, 2-756, 2-757, 2-758, 2-759,
4 and 2-760, relating to energy benchmarking; declaring purpose; defining terms;
5 requiring benchmarking of covered municipal properties; detailing benchmarking
6 reporting procedure; declaring certain benchmarking exemptions and time extensions;
7 implementing audit of meters and streetlights; establishing energy savings program;
8 requiring annual reports and analysis; and authorizing rulemaking.

9

10 **Now, therefore, be it ordained by the Council of the City of Charleston:**

11

12 That the Municipal Code of the City of Charleston, as amended, be amended by adding
13 thereto a new Article, designated Article IX within Chapter 2, consisting of Sections 2-
14 751, 2-752, 2-753, 2-754, 2-755, 2-756, 2-757, 2-758, 2-759, and 2-760, all to read as
15 follows:

16

17 **Chapter 2. – Administration.**

18 **ARTICLE IX. – ENERGY BENCHMARKING.**

19

20 **Sec. 2-751. – Purpose of Energy Benchmarking Ordinance.**

21

22 The Purpose of this Article and energy benchmarking is to encourage efficient
23 use of municipal energy paid by taxpayers and to reduce municipal pollution. This
24 Article requires Covered Municipal Properties to annually measure and disclose energy
25 usage to the City Manager. Furthermore, this Ordinance will authorize the City Manager
26 to collect energy usage data to enable more effective energy and climate protection
27 planning by the City and others and to provide information to the real estate
28 marketplace to enable its members to make decisions that foster better energy
29 performance.

30

31 **Sec. 2-752. – Definitions.**

32

33 For the purposes of this section, the following definitions shall apply:

34

35 "Benchmark" means to input and submit the total energy and water consumed

36 for a property for the previous calendar year and other descriptive information for such
37 property as required by the benchmarking tool. Total energy and water consumption
38 shall not include separately metered uses that are not integral to building operations, as
39 determined by the City Manager.

40

41 “Benchmarking date” means on or before October 31 of each year.

42

43 “Benchmarking submission” means a subset of:

44 (1) Information input into the benchmarking tool; and

45 (2) Benchmarking information generated by the benchmarking tool, as
46 determined by the City Manager.

47

48 “Benchmarking tool” means the U.S. Environmental Protection Agency’s
49 ENERGY STAR® Portfolio Manager, or any additional or alternative tool adopted by the
50 City Manager, used to track and assess the energy and water use of certain properties
51 relative to similar properties.

52

53 “Building operator” means the department or agency head that operates,
54 maintains, and/or pays energy utility bills.

55

56 “City Manager” means the City Manager of the City of Charleston or, at the City
57 Manager’s sole discretion, a designee for the specific purpose of carrying out the
58 requirements of this Article.

59

60 “Covered Municipal Property” means a property that is owned, leased, or
61 managed by the City such that the City regularly pays all or part of the annual energy
62 and/or water bills.

63

64 “Energy” means electricity, natural gas, steam, or other product sold by a utility to
65 a customer of a property, or renewable on-site electricity generation, for purposes of
66 providing heating, cooling, lighting, water heating, or for powering or fueling other end-
67 uses as recorded in the benchmarking tool.

68

69 “ENERGY STAR score” means the 1-100 numeric rating generated by the
70 ENERGY STAR Portfolio Manager tool as a measurement of a building’s energy
71 efficiency.

72

73 “ENERGY STAR Portfolio Manager” means the tool developed and maintained
74 by the U.S. Environmental Protection Agency to track and assess the relative energy
75 performance of buildings.

76

77 “Gross floor area” means the total property area, measured between the outside
78 surface of the exterior walls of the building(s). This includes all areas inside the
79 building(s) including but not limited to lobbies, tenant areas, common areas, meeting
80 rooms, break rooms, atriums (count the base level only), restrooms, elevator shafts,
81 stairwells, mechanical equipment areas, basements, and storage rooms.

82

83 “Retrocommissioning practices” means processes that seek to improve how
84 building equipment and systems function together. Such practices are designed also to
85 resolve problems that occurred during design, construction, or that have developed
86 throughout the building's life; improving a building's operations and maintenance
87 procedures to enhance overall building performance.

88

89 “Shared benchmarking information” means information generated by the
90 benchmarking tool and descriptive information about the physical property and its
91 operational characteristics, which is shared with the public. The information, as defined
92 by the ENERGY STAR Portfolio Manager glossary, shall include, but need not be
93 limited to:

94 (1) Descriptive information:

95 (A) Property address;

96 (B) Primary use;

97 (C) Gross floor area;

98 (D) Number of floors;

99 (E) Number of years the property has been ENERGY STAR® Certified

100 and the last approval date, if applicable; and

101 (F) Individual or entity responsible for the benchmarking submission.

102 (2) Site and source energy use intensity:

103 (A) Weather normalized site and source energy use intensity;

104 (B) The ENERGY STAR score, where available;

105 (C) Total annual greenhouse gas emissions;

106 (D) Monthly energy use, by fuel type;

107 (E) Monthly peak electricity demand;

108 (F) Indoor water use and water use intensity (consumption per gross
109 square foot);

110 (G) Outdoor water use (where available);

111 (H) Total water use;

112 (I) The ENERGY STAR Water Score, where available;

113 (J) General comments section, if needed, to explain the building's

114 ENERGY STAR scores; and

115 (K) Compliance or noncompliance status.

116

117 “Utility” means an entity that distributes and/or sells natural gas, electric, water,
118 or thermal energy services for buildings.

119

120 “Water audit” means that part of an audit that addresses the water systems.

121

122 **Sec. 2-753. – Applicability.**

123

124 This Article is applicable to all Covered Municipal Properties. All owners of other
125 properties within the City of Charleston are encouraged, but not required, to follow the
126 benchmarking portions of this Article.

127

128 **Sec. 2-754. – Benchmarking Requirement for Covered Municipal Properties.**

129

130 No later than October 31, 2021, and by October 31 every year thereafter, the
131 total energy and water consumed by each Covered Municipal Property, along with all
132 other descriptive information required by the Benchmarking Tool, shall be entered into
133 the Benchmarking Tool for the previous fiscal year.

134

135 **Sec. 2-755. – Benchmarking Reporting Procedure.**

136

137 (a) For every Covered Municipal Property subject to this Article, the building
138 operator shall annually submit to the City Manager an energy and water benchmarking
139 report in an electronic format as established by the City Manager, by the benchmarking
140 date.

141

142 (b) The information included in the annual energy and water benchmarking
143 report shall include, at a minimum, the Shared Benchmarking Information for the
144 previous calendar year.

145

146 (c) The building operator of each Covered Municipal Property shall provide to the
147 City Manager all data necessary for the City Manager to:

148 (1) Enter it into the benchmarking tool and

149 (2) Create an energy and water benchmarking report based on an
150 assessment of the aggregated total energy and water consumed by the whole property
151 for the entire calendar year being reported.

152

153 (d) Before submitting a benchmarking report the building operator shall run all
154 automated data quality checker functions available within the benchmarking tool and
155 shall verify that all data has been accurately entered into the tool. In order for the
156 benchmarking report to be considered in compliance with this Article, the building
157 operator shall correct all missing or incorrect information as identified by the data quality
158 checker prior to submitting the benchmarking report to the City Manager.

159

160 (e) In order to plan for potential solar panel installation, the building operator
161 shall include information regarding whether any of the building operator's Covered
162 Municipal Properties are, or will soon be, in need of replacing or repairing its roof. The
163 building operator shall also describe any evaluation regarding the suitability for solar
164 panels on the building that has been conducted on any Covered Municipal Properties.

165

166 (f) Where the current building operator learns that any information reported as
167 part of the benchmarking submission is inaccurate or incomplete, the building operator
168 shall amend the information reported within the benchmarking tool and shall provide the
169 City Manager with an updated benchmarking submission within 30 days of learning of
170 the inaccuracy.

171

172 **Sec. 2-756. – Benchmarking Exemptions; Time Extensions.**

173

174 (a) Benchmarking is not required for a Covered Municipal Property for the
175 current reporting year if the building operator submits documentation to the City
176 Manager, in such form and with such certifications as required by the City Manager,
177 establishing that the property met one or more of the following conditions for the
178 calendar year to be benchmarked:

179 (1) A demolition permit for the entire building was issued during that year,
180 provided that demolition work commenced and legal occupancy was no longer possible
181 prior to end of that year;

182 (2) The property did not receive energy or water utility services during that
183 year; or

184 (3) Due to special circumstances unique to the property, strict compliance
185 with provisions of this Article would not be in the public interest.

186

187 (b) Any building operator requesting an exemption from benchmarking shall, by
188 June 1 in the year for which the exemption is being requested, submit to the City
189 Manager any documentation reasonably necessary to substantiate the request or
190 otherwise assist the City Manager in the exemption determination. Any exemption
191 granted will be limited to the benchmarking submission for which the request was made
192 and does not extend to past or future submittals. Any requested exemptions, whether
193 approved or denied, shall be included in the annual report described in Section 7-759 of
194 this Article, as well as the reasons for the exemption being approved or denied.

195

196 (c) Any building operator may apply for a time extension to complete and submit
197 a benchmarking report if, despite such building operator's good faith efforts, they are
198 unable to complete the required actions prior to the scheduled due date due to the
199 failure of either a utility provider or a tenant (or both) to provide the building operator
200 with information needed to complete this report. The building operator requesting an
201 extension shall submit to the City Manager any documentation reasonably necessary to
202 substantiate the request or otherwise assist the City Manager in the determination. For
203 each property, the City Manager may grant no more than two such extensions per year
204 of no more than thirty days each.

205

206 **Sec. 2-757. – Audit of Meters and Streetlights.**

207

208 In addition to the other requirements of this Article, the City Manager shall
209 develop and administer a program for auditing the streetlights and energy metering
210 devices for both electricity and natural gas currently installed at all city buildings or
211 otherwise paid by the city, for purposes of determining whether such devices are active
212 or inactive. Such a program shall be designed to audit all energy metering devices by
213 July 1, 2022 and all streetlights by July 1, 2023. In the event the City Manager
214 determines during such an audit that an energy metering device is no longer active, the
215 City Manager shall notify the energy service provider to request removal of such device
216 and adjustment of utility bills to remove any inappropriate charges associated with such
217 meter.

218

219 **Sec. 2-758. – Energy Savings Program.**

220

221 (a) By July 1, 2022, the City Manager shall establish an energy savings program
222 designed to reduce energy usage for electricity, natural gas, fuel oil, and steam in all
223 Covered Municipal Properties by 25% below FY2019 levels by FY2031, as well as
224 otherwise reducing energy costs.

225

226 (b) Any program established pursuant to this section shall include:

227 (1) At least one interim savings goal for a percentage savings to be
228 achieved by the fiscal year 2025-2026;

229 (2) A plan for prioritizing which Covered Municipal Properties should be
230 first audited and identified for efficiency improvements;

231 (3) A plan for implementing retrocommissioning practices, ensuring that
232 buildings are operated in a manner that maximizes the energy saving potential of any
233 efficiency improvements made; and

234 (4) A framework for evaluating when a Covered Municipal Property is
235 suitable for installing solar panels in order to reduce energy costs.

236

237 **Sec. 2-759. – Annual Report and Analysis.**

238

239 (a) Beginning no later than December 1, 2022 and every year thereafter, the City
240 Manager shall make available on a publicly accessible website an annual report
241 covering the previous fiscal year, including:

242 (1) The measured energy use of all Covered Municipal Properties;

243 (2) A summary of energy and water consumption statistics;

244 (3) An assessment of compliance rates, accuracy and issues affecting
245 accuracy, changes across the portfolio over time;

246 (4) Any energy savings measures taken pursuant to the program
247 established in Section I of this Article;

248 (5) An evaluation of solar for all Covered Municipal Properties, including
249 any buildings that have been identified as needing roof repairs in the next five years;
250 and

251 (6) Trends observed.

252

253 (b) If the circumstances of the solar viability of any Covered Municipal Properties
254 has not changed since a previous evaluation, the City Manager does not need to make
255 a new evaluation.

256

257 (c) By August 1, 2026, the City Manager shall review the progress toward the
258 FY2026 interim goal established pursuant to Section 2-758 of this Article. If the FY2026
259 goal has not been met, the City Manager shall make recommendations to the City
260 Council as to whether amendments to this section or other measures are necessary to
261 meet the goal of 25% reduction by FY2031.

262

263 (d) Nothing in this ordinance shall prevent the City Manager from including all
264 such information in a combined annual energy and water efficiency report covering the
265 progress of all of the City's energy efficiency ordinances and programs.

266

267 **Sec. 2-760. – Rulemaking.**

268

269 In addition to all of the authority granted in this Article, the City Manager has
270 plenary power and authority to promulgate any such rules necessary to carry out the
271 provisions of this Article.