



A Smart Solution:

EmPOWER Maryland Is Saving
Energy, Saving Money,
and Boosting Our Economy

Maryland PIRG
Foundation

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Executive Summary

Maryland electricity consumers are beginning to reap the benefits of the state's ambitious efforts to improve energy efficiency and measures to cut peak demand. Consumers are saving money and avoiding paying for expensive new infrastructure projects, while employers have been able to increase their competitiveness and hire new staff.

Energy efficiency measures to cut peak demand are delivering significant benefits for Maryland's ratepayers and economy. **Residential, commercial and industrial ratepayers will spend \$60 million less for electricity each year because of energy efficiency improvements made in 2009 and 2010.**

In the face of spiking electricity rates, proposals for costly new transmission lines and power plants, and growing concern about the environmental and public health impacts of electricity generation, Maryland adopted strong energy efficiency and peak demand goals in 2008. The EmPOWER Maryland Act established a goal of reducing per capita electricity consumption by 15 percent by 2015. In response, utilities and state agencies have invested millions of dollars in energy efficiency.

Efficiency incentives offered by utilities and state and local governments have helped consumers across the state reduce their electricity use. In the aggregate, these small investments by thousands of

homeowners yield millions of dollars in savings.

- An example of an efficiency investment is the work done by Frederick homeowner David Barrow, who reduced his electricity consumption by 30 percent after a home energy audit showed him where to seal air leaks in his home and how to make other modest improvements to the efficiency of his home. (See case study on p. 16.)
- In Talbot County, Jack Davis made efficiency improvements to ensure the longevity of his house and reduced his electricity consumption by 23 percent in just the first three months. (See case study on p. 15.)
- Energy efficiency investments like these will save consumers across Maryland \$900 million over the life of the investments.

Energy efficiency investments will also help ratepayers save money for years to come by postponing or avoiding the need for costly new transmission and generation capacity.

- Proposals to build two new high-voltage transmission lines into Maryland have been scrapped in the past year because electricity demand dropped enough that the new power lines are not needed. The average Maryland household will save \$4 per year with the postponement of the Mid-Atlantic Power Pathway (MAPP) line into the Delmarva Peninsula, a delay made possible by falling energy demand.
- On the hottest day of the summer 2011 heat wave, energy efficiency and demand-side programs helped reduce electricity consumption by Baltimore Gas & Electric (BGE)

customers by 971 MW and were vital to ensuring that the region didn't experience blackouts. Had Maryland constructed new natural gas-fired power plants to meet that power demand instead, it would have cost \$946 million. If a blackout had occurred, the cost to the economy would have been huge.

Maryland's economy benefits from energy efficiency as new jobs are created to implement energy efficiency programs, and as lower energy costs enable businesses to become more competitive.

- New jobs have been created by utilities and private energy efficiency firms to provide energy efficiency services to ratepayers around the state.
- An estimated 29 job-years of employment are created for every \$1 million invested in energy efficiency, meaning that the \$100 million that Maryland's electric utilities and customers invested in energy efficiency as of September 2010 has created 2,920 job-years of employment.
- In 2010, at least 1,000 workers were trained for energy efficiency jobs.
- Baltimore-based Hawkeye Construction has added 18 employees to serve growing consumer demand for energy efficiency services. The firm pays competitive wages and provides training for workers entering the energy efficiency field, a welcome opportunity for construction workers idled by the economic downturn. (See case study on p. 20.)
- Businesses that have invested in energy efficiency, such as General Motors at its White Marsh facility, have been able to become more

competitive as more efficient use of energy has lowered their utility bills. (See case study on p. 22.)

Maryland's investment in energy efficiency has begun paying off for consumers and Maryland's economy. However, implementation of EmPOWER Maryland is falling short and the state is failing to reap all the potential benefits of reduced electricity consumption. EmPOWER Maryland is not on track to achieve the 2015 goals for reduced electricity consumption or peak demand.

- As of the end of 2010, utility programs had achieved only 14 percent of the 2011 benchmark for reducing electricity consumption and 42 percent of the 2011 peak demand goal.
- Even if utilities continue to achieve the same level of quarterly savings on an annual basis through 2015 as they did in the fourth quarter of 2010, they will only achieve 46 percent of their goals for electricity savings.

These large shortfalls indicate that utilities, the Public Service Commission (PSC), and the Maryland Energy Administration must include more aggressive measures to save energy as they draft new plans to achieve EmPOWER Maryland targets over the next three years. In particular, the Public Service Commission should:

- **Recognize all the benefits of EmPOWER Maryland** – The Public Service Commission should use a broad cost-effectiveness test

that captures all the benefits of energy efficiency, such as the avoided costs of building transmission lines and the public health benefits of using less energy.

- **Improve program flexibility** – Allowing utilities more flexibility to revise and improve their programs and improving the timeliness of the PSC's response to utilities' proposed offerings will make the process more flexible and responsive to change.
- **Enforce timelines and targets** – Utility failure to meet electricity savings targets or reporting deadlines set by the PSC should have clear consequences for the utility. Incomplete reporting by utilities undermines the PSC's ability to evaluate programs.

The state should:

- **Restore state funding for energy efficiency** – Revenue raised through the Regional Greenhouse Gas Initiative (RGGI) should not be diverted from energy efficiency investments.
- **Coordinate programs statewide** – Coordinated programs with a single brand are more effective than separate efforts. When each utility offers different programs, it complicates outreach, education and training for consumers and contractors.

Introduction

In late July, temperatures in Maryland and the Mid-Atlantic soared, breaking records. In Baltimore, the official temperature was 106 degrees, Washington, D.C., reached 105 degrees, and Philadelphia reached 102 degrees.¹ With the heat index making it feel more like 120 degrees, electricity demand for air conditioning and refrigeration soared.

To ensure that enough electricity was available, BGE activated its Peak Rewards program, reducing or shutting off air conditioning to thousands of customers who signed up for the program in ex-

change for an annual payment. Through this voluntary arrangement* with a subset of its customers, and through other peak demand-reduction programs, BGE reduced electricity use enough to help ensure the reliability of the power grid for all users.

Reducing peak demand for electricity is one of the goals of the EmPOWER Maryland Act. The legislation calls for reducing total electricity demand and consumption during peak periods to save money for consumers and reduce the need for costly investment in new genera-

* While the program is voluntary and participants receive an annual discount on their bill for participating, BGE was the target of widespread criticism for not having adequately explained the terms of the PeakRewards program to its customers. Many customers were surprised when their air conditioners were shut off for hours on end. In response, BGE has clarified the terms of the program and reminded all customers of their right to withdraw, though relatively few have done so.²

tion and transmission capacity that would be used for just a few hours every year.

Consider what would have happened if the power hadn't kept flowing during the heat wave. Tens of thousands of homes and businesses would have been without air conditioning, lighting, refrigeration, or access to computers. Customers with medical reasons for needing steady air conditioning would have had their health jeopardized. Businesses would have sent employees home, costing millions of dollars in lost wages and productivity. Food would have spoiled in restaurants and homes.

We would now be facing calls for expensive upgrades to transmission and generation capacity, investments that would cost hundreds of millions of dollars and would be paid for by all ratepayers.

That worst-case scenario didn't happen, because EmPOWER Maryland works, helping to protect consumers and the state's economy from unpredictable electricity prices, ensuring the reliability of the electricity supply, and reducing dependence on fossil fuels.

Why Maryland Needs to Reduce Electricity Demand

By reducing electricity consumption, Maryland will address some of the biggest problems of its current electricity system. Those challenges include rising monthly costs, looming bills for additional infrastructure, and air pollution that worsens global warming and endangers public health.

Energy efficiency can help lower bills for individual households. Maryland consumers have seen their bills rise dramatically in the past decade. From 1999 to 2009, residential electricity prices increased 39 percent (adjusted for inflation) in Maryland.³ As a result, the typical household in the state experienced a \$590 increase in annual electricity costs, from \$1,250 per year in 1999 to \$1,843 per year in 2009.⁴

As energy use rises, existing power plants and transmission lines may be insufficient to meet demand, especially during peak periods. On the hottest summer days when hundreds of thousands of consumers run their air conditioners at the same time, the region's electric system does not have enough transmission or generating capacity to meet demand. One solution to this problem is to build expensive new power plants or transmission lines. A less expensive option is to invest in enough energy efficiency and peak demand reduction to ensure that all consumers continue to receive power during the few hours each year when the grid is under stress from peak demand.

Energy efficiency can reduce the amount of electricity that must be pro-

duced at the dirtiest plants. Coal-fired power plants, which in 2009 produced 55 percent of the electricity generated in Maryland, are major contributors to Maryland's poor air quality.⁵ The majority of Marylanders live in areas with excessive levels of ground-level ozone pollution, which damages lung tissue and may cause premature death. In 2011, all but three Maryland counties evaluated by the American Lung Association for ozone received "F" letter grades for unhealthy air.⁶ In many counties, particulate matter pollution is also a problem. This particulate "soot" contains hundreds of toxic chemicals, some of which cause cancer,

irritate lung tissues, or cause changes in the function of the heart that increase the risk of heart attacks.

Electricity consumed in Maryland also is responsible for millions of pounds of global warming pollution. Electricity generated in Maryland produced 28 million metric tons of carbon dioxide in 2008, equal to 38 percent of total emissions in the state.⁷ Because Maryland imports power from neighboring states, total emissions related to electricity consumption were even higher. Lowering electricity use through energy efficiency and reductions in peak demand reduces global warming pollution.

Tapping Into Energy Efficiency Across the State

In recognition of the financial, health and environmental burdens imposed by high electricity consumption, Maryland has established strong goals for improving energy efficiency across the state. With the EmPOWER Maryland legislation, adopted in 2008, Maryland set a goal of cutting per capita electricity consumption by 15 percent by 2015. This reduction goal applies to total consumption and to consumption during times of peak demand.

The five utility companies that serve the majority of the state's consumers and the Maryland Energy Administration (MEA) are leading the effort to meet the goals of EmPOWER Maryland. The MEA and utilities assist residential,

commercial and industrial consumers in reducing their power consumption. Upgrades for lighting and more efficient appliances or equipment help thousands of customers a year. Home energy audits and customized commercial and industrial programs reach a more limited number of consumers, but nonetheless have a big impact on total energy consumption.

The following section outlines many of the ways that Maryland's residential, commercial and industrial consumers receive help improving energy efficiency and reducing peak demand. The cumulative benefits of these energy efficiency programs are discussed in the subsequent section.

Energy Efficiency Beyond EmPOWER Maryland

Though the state's EmPOWER Maryland legislation is the biggest driver of energy efficiency improvements, other initiatives also influence energy efficiency.

Appliance Efficiency Standard

In 2004, Maryland adopted the Energy Efficiency Standards Act (EESA), which required that certain appliances sold in the state meet minimum energy efficiency standards. While many of the appliances on that list are now covered by strong federal standards, every two years the MEA must consider whether to make current standards more stringent or develop new standards for appliances not covered by the law.⁸ The MEA delivers its proposals to the General Assembly.

Building Codes: Private and Public

Building codes determine how energy efficient new buildings will be. Maryland requires that commercial and residential builders statewide comply with the Maryland Building Performance Standards (MBPS), which mirror the Building Officials and Code Administrators (BOCA) International codes. The Maryland code is automatically updated when BOCA is updated.⁹ Local governments can adopt different codes only if they are more stringent than the MBPS, which currently incorporates the 2009 International Energy Conservation Code.¹⁰

A more stringent building energy use standard applies to buildings owned by the state government. The Maryland High Performance Buildings Act, passed in April 2008, requires that new state-owned buildings or existing buildings undergoing extensive renovation must obtain a higher efficiency rating than applies to other buildings. Large capital projects must achieve a silver-level ranking in the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) standards for green buildings.¹¹

Residential Opportunities

Thanks to EmPOWER Maryland, state agencies, local governments and the state's five biggest utilities provide extensive support to residential consumers interested in reducing their electricity consumption. Help is available for:

Improving lighting efficiency. Utilities encourage customers to install energy-efficient lighting in their homes through millions of dollars in rebates. Replacing incandescent light bulbs with

more efficient compact fluorescent bulbs can cut a home's lighting costs by 50-75 percent.¹²

Upgrading heating and cooling efficiency. All five of Maryland's major utilities offer retrofits for their customers' heating, ventilation and cooling systems (HVAC). Because heating and air conditioning can account for up to half of a home's energy use, efficiency improvements to HVAC systems deliver huge energy savings for consumers.¹³ Typi-

cally, utilities send contractors trained in HVAC tune-up and installation to analyze and make recommendations for a home's existing system during a site visit. Customers can then take advantage of a variety of rebates on services and equipment to make their systems more efficient.

Installing efficient appliances. The MEA and utilities offer customers rebates of up to \$500 to replace water heaters, central and room air conditioners, refrigerators, washers, and dryers with new energy-efficient appliances.¹⁴ The MEA's incentives extend appliance rebates to customers of small municipal and cooperative utilities.¹⁵

Identifying whole-house efficiency opportunities. Energy audits allow building owners to identify places where a building's efficiency could be improved. A short audit may involve an hour-long walk-through by an energy professional to identify simple efficiency improvements customers can make to achieve immediate savings of about 3-4 percent on their power bills.¹⁶ During the walk-through, auditors examine the condition of the home's insulation, HVAC system, windows and doors, lighting and appliances, and water heating equipment.¹⁷ Some utilities, including Pepco, Delmarva, and BGE, offer this quick audit for free if customers allow installation of at least three of the following measures during the visit: compact fluorescent light bulbs, faucet aerators, efficient-flow shower heads, water heater pipe insulation, and water-heater tank wraps.¹⁸

A more comprehensive audit allows an energy efficiency professional to run several diagnostic tests using specialized equipment. The resulting suite of efficiency recommendations is designed

to improve the overall efficiency of the home, rather than make a patchwork of improvements. Thanks to EmPOWER Maryland, customers have access to thousands of dollars in rebates for these improvements.

Commercial and Industrial Opportunities

Commercial and industrial electricity users can receive help for upgrades to lighting, motors and controls, HVAC, refrigeration systems, energy management systems, compressed air systems, building shell improvements, and industrial processes. To address more complex systems unique to individual businesses, many utilities offer consumers customized technical and financial assistance. The MEA also provides financial help.

Because combined heat and power (CHP) projects at large industrial facilities represent a large, untapped energy efficiency resource in the state, the MEA offers help identifying good opportunities. Facilities with CHP operate more efficiently by burning fuel to produce both electricity and heat. The MEA has launched a program to partially cover the cost of feasibility studies for industrial facilities seeking to implement CHP.

The MEA also helps small commercial customers replace inefficient equipment before the equipment is entirely worn out.

State government buildings also present opportunities for energy efficiency, but government agencies are typically ineligible for other types of efficiency incentives. Maryland is providing \$5 million in zero-interest loans to state agencies for efficiency improvements.¹⁹

EmPOWER Maryland Creates Widespread Benefits

Investing in energy efficiency and measures to reduce peak demand lowers bills for consumers, helps to avoid costly new infrastructure upgrades, and creates jobs.

Lower Bills

EmPOWER Maryland has saved consumers money by reducing their energy consumption and thus their utility bills. Because of efficiency measures taken in 2009 and 2010 by more than 150,000 Marylanders, consumers will spend \$60 million less on electricity every year. Over the life of these investments, consumers will save up to \$900 million on their utility bills, according to the Maryland Energy Administration.²⁰ (See the case

studies on p. 15 and p. 16 for examples of two residential consumers who have made investments in energy efficiency.)

Furthermore, investment in energy efficiency has begun to lower the cost of electricity for all consumers.

Maryland is part of a regional power grid, known as PJM, that includes Delaware, Illinois, Indiana, Kentucky, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and Washington, D.C. PJM requires utilities to secure enough capacity to provide electricity to all customers, even when demand is high.

Transmission constraints limit the ability of electricity generators to buy and sell power throughout the grid, creating regional differences in the price of capac-

ity. Historically, the price has been much higher in the eastern portion of the grid (including central and eastern Maryland) than the western portion. That has begun to change as Maryland and other states have improved efficiency and lowered electricity use.

The projected price of capacity—which is just a fraction of the total cost of electricity—for the eastern portion of the PJM region has fallen by roughly 40 percent from a year earlier, while capacity prices in the western areas rose.²¹ Capac-

ity costs in the two areas are now nearly the same. The grid operator attributes this near-parity in capacity prices to major declines in expected power demand by 2014-2015.²²

Maryland utilities are allowed to bid energy efficiency into the future market mix and to receive money for providing that resource. Utilities are to share with consumers any financial benefit from the sale of energy efficiency resources, income that can help offset the cost of local energy efficiency investments.

Protecting an Investment: Jack Davis

As John P. “Jack” Davis entered retirement, he was concerned about protecting his Talbot County home, built in the 1960s right on the Chesapeake Bay, and ensuring it wouldn’t require significant maintenance as he aged. Davis, a retired accountant, says, “The wind blows like crazy here because we’re right on the water....When we retired, we replaced every window in the house with energy-efficient windows, replaced our roof with a 50-year roof, and covered all the wood outside with a composite material so it wouldn’t rot. Moisture is a killer.”

Concerned about dampness and odor from the crawl space under the house, Davis called the heating and cooling company he had used for years for preventative maintenance. They came to the house to investigate the odor and recommended he get an energy audit. When the auditors came, Davis says “I had no faith or interest in what they were doing, but when they finished their presentation, I was sold and said, ‘Let’s do it.’”

With help from a \$2,800 grant from the Maryland Energy Administration’s Home Performance Rebate Program, Davis hired Total Home Performance, whose workers spent roughly two weeks upgrading the home’s efficiency. The work included adding insulation to the attic, insulating ductwork, sealing all holes where wires or pipes passed from the outside to the inside, and sealing all gaps around ductwork, water pipes and drains that entered the house from the crawl space.

At the same time, the workers changed the treatment of the crawl space to address the moisture problems that had originally prompted Davis’ concern. Though crawl spaces traditionally have been vented to control moisture, sealing the space and installing other measures to address water infiltration can improve efficiency and better control moisture levels. Workers removed all insulation from under the house, sealed the foundation walls with foam insulation, sealed all of the vents, and covered the ground of the crawl space with a heavy duty plastic liner. They installed a dehumidifier, a second sump pump, and a new French drain.

Last year, Davis spent \$3,500 for oil to heat his home, and \$1,300 for electricity. Based on what he’s seen this summer, he predicts he’ll save about \$900 per year on electricity, plus more on oil. For just July, August and September 2011, Davis consumed 23 percent less electricity and spent 46 percent less, compared to 2010.

Residential Energy Savings: David Barrow

For more than 25 years, Myersville homeowner David Barrow has meticulously tracked his monthly Allegheny Power bills and home heating costs. He started exploring opportunities to save energy in his home after noticing an alarming increase in energy prices after deregulation of the state's electricity market.

"I noticed our consumption had been dropping off for several years, especially after the kids left for college. But our bills were still increasing," he said. "We were concerned about the cost burden of such major utility bills."

With the help of more than \$9,000 in federal and state tax credits, Barrow installed a geothermal heating and cooling system in his 4,800 square-foot, five-bedroom home northwest of Frederick. During the installation, the owner of the geothermal company recommended that Barrow look into a full energy audit for his home. Barrow, who had never heard of home energy audits, agreed to schedule an audit—and then promptly cancelled it.

"I must have scheduled and cancelled the audit five times," Barrow said. "I just wasn't sure it was worth the money. I thought I knew everything that could be wrong with my house."

Happily, Barrow said, he was mistaken.

The auditor found that the six skylights in Barrow's home were allowing enough cold air into the house to create a thirty-degree difference between the floor and the skylights. After adding a little spray foam to seal the seams, the temperature difference dropped to three degrees.

"[The auditor] also found that my drywall didn't reach all the way to my roof, so attic air was getting in," Barrow said. Additionally, the audit revealed that wind wasn't infiltrating the house through leaky windows, as Barrow had thought; instead, the outside log siding had air leaks in the seams.

"There were lots of little things, most of which I could fix myself for \$15-\$20." An air infiltration test, for instance, showed that Barrow's bathroom vent was clogged, and as a result air was coming into the vent backwards. "So, I just knocked out all the dust and debris from the vent with a brush, and it started working properly again," he said.

Barrow also replaced several of his major appliances with high-efficiency models, including his hot water heater, several television sets, and his kitchen stove. He switched all lights in his home to light-emitting diode (LED), compact fluorescent, or halogen lights.

Barrow isn't a typical Maryland electricity consumer. His large house consumes more energy than the typical home, and his investments in energy efficiency and clean energy technologies are bigger than most Marylanders could afford. But by reducing his energy consumption, Barrow has produced savings that provide benefits for all consumers.

Barrow estimates that in two years, he put roughly \$32,000 into his home for efficiency improvements, including weatherizing to stop air infiltration and fixing leaks in his home's duct work. Combined with his geothermal

Photo: David Barrow



David Barrow upgraded the efficiency of his kitchen appliances as part of his effort to reduce electricity consumption.

unit, these measures cut Barrow's annual electricity consumption 30 percent, from 36 MWh to 25 MWh per year, a reduction equal to the amount of electricity consumed in a typical Maryland home. His propane consumption declined even more dramatically, from 800 gallons to 200 gallons.

"My goal is to do things that are 'green' that don't require me to change things in my life but allow me to use technology to my benefit," Barrow said. "There really isn't a justification for *not* doing this. There is just so much evidence that you can save a lot of money through efficiency." In addition to the savings Barrow has experienced in his home, he has created savings for all Marylanders by helping to bring down the cost of electricity and reducing the need for new infrastructure.

"There really isn't a justification for *not* doing this. There is just so much evidence that you can save a lot of money through efficiency."

– Dave Barrow,
Frederick homeowner

Avoided Costs

Maryland's investment in energy efficiency and in measures to cut peak demand have helped reduce the need for costly new transmission capacity, while also sparing the state's economy from the consequences of rolling brownouts during times of peak demand.

In Maryland, avoided costs—even before considering future reductions in electricity bills—exceed the amount that utilities and consumers have invested in energy efficiency. As of September 2010, the projected life-time benefits of energy efficiency facilitated by Maryland utilities were \$211 million, more than twice as much as utilities and customers had spent on energy efficiency. (See Table 1.) The independent evaluation of the costs and benefits of utility efficiency programs was performed by a company hired by the Public Service Commission.²³ The \$211 million in benefits does not include bill savings experienced by consumers, because those savings are considered merely a transfer payment from utilities to consumers.

Savings have grown significantly in the past year.

Congested high-voltage transmission lines in the Mid-Atlantic region have

limited the ability of utilities to import electricity from outside the region, prompting calls for construction of new transmission capacity. Before the current economic recession and before adoption of EmPOWER Maryland, the U.S. Department of Energy declared the entire corridor from Virginia to New York a congested corridor.²⁵ Pepco Holdings Inc. began planning a new transmission line, known as the Mid-Atlantic Power Pathway (MAPP), which would run 150 miles from Virginia to the Delmarva Peninsula, passing under the Chesapeake Bay. Responding to direction from PJM, which oversees long-term transmission and generation capacity planning in the region, two other companies proposed constructing the 275-mile Potomac-Appalachian Transmission Highline (PATH) from West Virginia into Maryland.²⁶

When planning for the MAPP line began, Pepco Holdings estimated the line would cost \$1.4 billion.²⁷ Assuming the average household uses 10,000 kWh of electricity annually, that would have cost customers an average of \$4 per year.²⁸ The PATH line would have been more expensive, costing an estimated \$2.1 billion.²⁹ That cost would have been shared by ratepayers across the PJM region, with

Table 1. Benefits of Efficiency Are Greater Than Costs²⁴

Utility	Cost (millions)	Electric System Benefits (millions) (avoided capacity and energy costs)
BGE	\$75.7	\$162.6
Pepco	\$14.3	\$37.4
DPL	\$2.5	\$4.5
SMECO	\$3.7	\$4.1
Potomac Edison	\$3.9	\$2.8
Total	\$100.1	\$211.4

the customers of BGE and Pepco each paying more than \$100 million.³⁰

After several years of delay in which declining demand for power reduced the need for a new power line, in February 2011 the planners of the PATH line withdrew their plans.³¹ In August, the MAPP line was placed on hold because PJM concluded that the region will not need the MAPP line for 10 years.³² This new power line will not be needed until 2019-2021, rather than 2013 as first anticipated.³³

Energy efficiency and measures to reduce peak demand have protected the Maryland economy from the high cost of power shortages. When electricity demand exceeds supply or transmission capacity, the power can go out over a large area. While a temporary power outage for residential customers is an inconvenience, outages affecting commercial establishments impose significant economic costs. Businesses cannot produce goods, perishable products may spoil, employees may not be able to work and lose wages, and equipment may be damaged. The loss of power for just a few hours may impose millions of dollars of losses on the affected region.³⁴

Despite record-breaking temperatures and power demand across the state in July of this summer, Maryland avoided blackouts. Energy efficiency investments in recent years helped keep demand in check, and demand control programs—such as BGE’s Peak Rewards program—allowed utility companies to reduce the amount of power delivered to customers who signed up for the program in advance. In total, BGE reduced peak power demand by 971 MW, helping to alleviate pressure on the generation and transmission system and avoiding blackouts that could have been costly for the state.³⁵

Furthermore, these cuts in peak demand cost very little compared to building additional power plants to meet

that demand. To secure 971 MW from generation would require construction of two medium-sized power plants. The cost of constructing this much capacity to operate just at times of peak demand would have been \$946 million.³⁶

More Jobs and Greater Economic Competitiveness

Improving energy efficiency and slashing peak demand creates new jobs in the local economy.

Auditors are needed to test the efficiency of buildings. Construction workers must seal air leaks, add insulation, and replace windows. Plumbers and heating specialists install more efficient heating and cooling systems. Office workers such as customer service agents, schedulers and accountants are needed to connect customers with weatherization assistance and make sure it is paid for correctly.

In addition, the energy savings that consumers reap from improved efficiency give them more money to spend locally instead of on electricity and natural gas. This may help support local businesses and restaurants.

Energy efficiency work supported by EmPOWER Maryland and by federal economic recovery spending has created jobs in Maryland. For example, BGE’s Limited-Income Energy Efficiency Program has helped to create 61 jobs at five construction and auditing firms.³⁷ (See case study on p. 20, “Creating Jobs: Hawkeye Construction,” for an example of how one construction company has added jobs.)

Economy-wide job creation is much greater. A recent estimate of job creation through energy efficiency investment in New England calculated that a \$1 million investment in electric efficiency creates 27 to 38 jobs for a year, depending on the state.³⁸ Assuming a similar rate holds true

Creating Jobs: Hawkeye Construction

When Andy Todtz and Chris Ronnebaum started Baltimore-based Hawkeye Construction, they didn't intend to focus on energy efficiency. Rather, their focus was on renovating old homes. As they deconstructed townhomes to little more than a shell and framing, Todtz and Ronnebaum noticed how much was missing from those old homes, such as insulation and air sealing. As they rebuilt the structures, the pair looked for ways to improve the homes and save energy.

Hawkeye Construction grew into a successful general construction firm, skilled at energy efficiency and reclamation of building materials for residential and commercial construction. As the economic recession took hold, however, and traditional construction projects slowed, Hawkeye Construction began performing more energy efficiency work as a way to ensure its staff remained employed. When the company contracted with Baltimore City to perform weatherization work, Todtz wasn't sure if it was worth doing or was right for the company, but in retrospect says it was "one of the better moves we've made."

The firm is now in its third year working with Baltimore City to weatherize homes. When a homeowner requests help with improving efficiency, the city sends an auditor to evaluate the efficiency and challenges of the building. Once the auditor creates a list of what needs to be done, staff from Hawkeye Construction perform the work, which often includes air sealing, adding blown-in insulation, installing water saving devices, and putting on water heater blankets. The scope of work also includes ensuring the home has functioning smoke detectors and carbon monoxide alarms. Todtz says that Hawkeye Construction has completed weatherization work on more than 500 homes at an average cost of \$2,700 per home.

In April 2010, Hawkeye Construction began working with BGE's weatherization program. When a BGE customer calls requesting a home energy audit and weatherization assistance, BGE contacts the weatherization company that is assigned to that zip code. Hawkeye Construction covers a number of zip codes in Baltimore City and Harford County. When assigned a home that needs weatherization, Hawkeye Construction performs an energy audit and then sends a crew to perform the needed weatherization upgrades, spending up to \$6,500 per job. The company has completed nearly 600 weatherization jobs for BGE, plus others for Pepco and Delmarva.

Because the company's weatherization work with Baltimore City had crews already working at full capacity, Hawkeye added 18 new staff to be able to handle the volume of jobs requested through utility weatherization programs, including four in August and September.⁴¹ The company hired three full-time auditors and multiple crew leaders and members. Hawkeye Construction also hired office staff to schedule appointments, complete invoices and process paperwork. Hourly staff earn a minimum of \$14 an hour and auditors earn \$40,000 to \$50,000 per year.

In addition, sub-contractors that Hawkeye relies upon for some aspects of its weatherization work have also added staff. One plumbing company has added two plumbers who work full-time on energy efficiency projects, and a heating and air conditioning contractor has also added two positions.

Hawkeye has identified new staff with the help of the Mayor's Office of Economic Development, Catholic Charities, and Civic Works, an organization that provides energy efficiency training. Hawkeye Construction hires staff with different levels of experience and training, and ensures that they receive the needed certification. BGE requires auditors who are certified through the Building Performance Institute (BPI). The Baltimore City weatherization contract requires employees to have training in weatherization tactics and lead paint handling. Crew leaders must receive crew leader training and BPI training. Hawkeye Construction has sent at least six employees through BPI training.

Continued strong public and utility investment in energy efficiency is crucial if Hawkeye Construction is to keep all its new staff. Federal economic recovery funds for energy efficiency will be gone in the spring, which could dramatically curtail Baltimore City's energy efficiency work. Utility programs through EmPOWER Maryland are also up for review. Todtz wonders what funds will be available to support weatherization work in the city, where he estimates that 80 to 90 percent of homes have had no energy efficiency work performed at all. He says that ensuring reliable funding for weatherization is a bigger challenge than finding and training staff. "My main concern," he says, "is how to keep these people working."

for Maryland, that means that the \$100 million that Maryland's electric utilities and customers invested in energy efficiency as of September 2010 has created 2,920 job-years of employment.³⁹ (See case study on p. 22, "Improving Competitiveness: GM Baltimore Operations," for an example of the broader impacts of efficiency.)

Multiple organizations in Maryland provide training to prepare workers for energy efficiency-related positions. The Maryland Energy Administration works with community colleges, nonprofits, and other state agencies to provide funds for energy retrofit training to prepare workers to implement energy efficiency and weatherization. In 2010 alone, approximately 1,000 people received energy efficiency training supported by the Maryland Energy Administration.⁴⁰ Other organizations and private employers also provide training to ensure that staff have the necessary skills and certifications.

Improving Competitiveness: GM Baltimore Operations

When General Motors (GM) shuttered its Broening Highway manufacturing plant in Baltimore after 70 years of operation, the company's future in Maryland looked bleak, with only its Allison Transmission plant in White Marsh remaining. The Broening Highway plant, which manufactured Chevy Astros and GMC Safari vans, joined a lengthening list of GM plant closures across the country as the company struggled to cope with multi-billion dollar losses. By the time the plant closed in 2005, GM had seen its share of the domestic vehicle market drop from nearly 50 percent in the 1970s to about 25 percent.⁴² In the face of intense competition from foreign vehicle manufacturers, particularly those in Asian countries, GM searched for new ways to gain an edge.

In Maryland, GM has found a better way forward. In addition to planning a new future in manufacturing electric vehicles, GM is honing its competitive advantage by cutting costs in its manufacturing processes, including through energy efficiency. At its White Marsh facility—also known as General Motors Baltimore Operations (GMBO)—energy consumption accounts for up to 5 percent of production costs for the heavy-duty and hybrid transmissions that GM currently manufactures.

To improve efficiency at GMBO, the company took advantage of the Save Energy Now program from the Maryland Department of Energy and BGE's Smart Energy Savers program to bring in professional energy auditors. Based on the auditors' recommendations, GM replaced 850 465-watt metal halide plant lights with 236-watt high efficiency fluorescent fixtures, cutting lighting expenditures by about half, according to John Raad, project manager for GM. It is also fixing costly leaks identified in the plant's compressed air system, one of

the plant's most energy-intensive processes, he said. The auditors also pointed out inefficiencies in GMBO's heating and cooling system that result in the system using too much outside air, but GM has deferred modifying it due to budget constraints.

"Every cubic foot of outside air you bring in requires you to spend energy to heat, cool and de-humidify it. [The audit said] we needed to modify our existing units by adding air quality sensors, and lots of programming work," Raad said. GMBO plans to make \$150,000 in upgrades to the existing system, which Raad expects will save about \$50,000 per year.

Raad is project manager for a new electric motor facility that GM plans to construct alongside its existing buildings at GMBO in White Marsh. The new building is an indication of GM's approach to improving competitiveness. GM's new \$270 million electric motor manufacturing facility will include virtually all the efficiency improvements recommended by auditors, after GM revisited the drawing board to integrate them into design plans.

"As we build the new facility and are spending the capital anyway, we figured we should do it right the first time," Raad said.

The new facility will include energy-efficient fluorescent lighting on the plant floor, LED parking lot and exterior building lights, high efficiency chillers for its air conditioning systems, variable frequency drives on all major compressed air and heating and cooling systems, and carbon dioxide monitoring equipment to gauge how much outside air to bring in and heat or cool. Between its old and new facilities, GM may invest up to \$600,000 on efficiency improvements, and in most cases, the company expects payback on the investments in two years or less.

Policy Recommendations

Maryland's support for energy efficiency in recent years has begun paying off. Efficiency measures and incentives offered by the state's five largest electric utilities, programs and training provided by the Maryland Energy Administration, and stronger efficiency standards are improving energy efficiency across the state. However, implementation of EmPOWER Maryland is falling short and the state is failing to reap all the potential benefits of reduced electricity consumption.

EmPOWER Maryland is not on track to achieve the 2015 goals for reduced electricity consumption or peak demand. Slow program development by utilities and lengthy review with the Public Service Commission delayed the start

of efficiency savings. Utilities have not identified how they will reach their EmPOWER Maryland goals, and the state has not specified how it will obtain the energy savings not assigned to utilities. Outreach to customers and actual implementation has ramped up slowly.

As a result, by the end of 2010, utility programs had achieved only 14 percent of the 2011 benchmark for reducing electricity consumption and 42 percent of the 2011 peak demand goal.⁴³ Even if utilities continue to achieve the same level of quarterly savings on an annual basis through 2015 as they did in the fourth quarter of 2010—their most productive—they will only achieve 46 percent of their goals for electricity savings.⁴⁴

Similarly, utilities appear likely to fall short of peak demand targets. Given the current pace of reductions in peak demand, utilities will fall roughly 28 percent short of their 2015 EmPOWER Maryland goal for peak demand savings.⁴⁵

These large shortfalls indicate that utilities, the Public Service Commission, and the Maryland Energy Administration must include more aggressive measures to save energy as they draft new plans to achieve EmPOWER Maryland targets over the next three years.

The Public Service Commission should continue to push utilities to meet their individual goals set by EmPOWER Maryland so that ratepayers receive the maximum benefit of energy efficiency. The PSC should:

- **Recognize all the benefits of EmPOWER Maryland** – The Public Service Commission should follow the lead of states that have adopted a broader cost-effectiveness test to capture benefits of energy efficiency that include avoided costs of building transmission lines and power plants, as well as public health benefits of using less energy. In addition, the PSC should collect information on these broad benefits of EmPOWER Maryland, including job creation.
- **Improve program flexibility** – Utilities should be granted more flexibility to revise and improve their programs and the PSC should improve the timeliness of its response to utilities' proposed offerings, making the process more flexible and responsive to change. The result will be that more customers will be able to participate and to achieve greater savings.

- **Enforce timelines and targets** – Utility failure to meet electricity savings targets or reporting deadlines set by the PSC should have clear consequences for the utility.
- **Collect complete data** – Utilities need to provide complete and accurate reports to the PSC. For example, inaccurate reporting by Pepco and Delmarva Power and Light (DPL) has stymied efforts by the Public Service Commission to evaluate the benefits and costs of EmPOWER Maryland. Pepco and DPL have repeatedly and knowingly submitted inaccurate reports to the PSC, preventing PSC staff from assessing the progress of those two utilities' programs and impairing the PSC's ability to make decisions about how to improve the programs.⁴⁶

The state should:

- **Restore state funding for energy efficiency** – Of the money the state receives for selling carbon allowances in the Regional Greenhouse Gas Initiative (RGGI), the General Assembly set aside 46 percent for energy efficiency investments in 2009. In 2011, this percentage fell to 20 percent.
- **Coordinate programs statewide** – Experience in other states teaches that coordinated programs with a single brand are more effective than separate efforts. When each utility offers different programs, it complicates outreach, education and training for consumers and contractors.

- **Continue to strengthen building codes and appliance standards**
 - Maryland should continue to regularly update its building codes and appliance standards, and to pursue strong enforcement, to maximize the energy efficiency of the state’s homes and businesses.

Residents, small businesses, and large companies have all benefited from

Maryland’s energy efficiency efforts to date. However, the state has barely tapped its efficiency potential, and cannot afford to back off from its efforts. Meeting the goals of EmPOWER Maryland will provide hundreds of millions of dollars of benefit for consumers and create thousands more jobs, while reducing Maryland’s dependence on fossil fuels.⁴⁷

Notes

1. Frank Roylance, "Friday's Heat Shattered Records All Over the Place," *The Baltimore Sun* (Maryland Weather blog), 22 July 2011.
2. Liz Kay and Julie Baughman, "Consumer Advocates Call for Review of BGE Program," *The Baltimore Sun*, 25 July 2011.
3. U.S. Department of Energy, *Maryland Electricity Profile*, April 2011. Adjusted for inflation using data from Federal Reserve Bank of Minneapolis, *Consumer Price Index, 1913*, downloaded from www.minneapolisfed.org, 5 October 2011.
4. U.S. Department of Energy, Energy Information Administration, *Form EIA-861, Annual Electric Power Industry Report*. Data for bundled sales only, presented in 2008 dollars. Adjusted for inflation using data from Federal Reserve Bank of Minneapolis, *Consumer Price Index, 1913*, downloaded from www.minneapolisfed.org, 5 October 2011.
5. U.S. Department of Energy, Energy Information Administration, *Maryland Electricity Profile*, April 2011.
6. American Lung Association, *State of the Air 2011*, 2011.
7. U.S. Department of Energy, Energy Information Administration, *State CO2 Emissions*, 26 October 2011.
8. DSIRE Database of State Incentives for Renewables and Efficiency, *Maryland Incentives/Policies for Renewables & Efficiency, Appliance Energy Efficiency Standards*, 30 June 2010.
9. DSIRE Database of State Incentives for Renewables and Efficiency, *Maryland Incentives/Policies for Renewables & Efficiency, Maryland Building Energy Code*, 26 August 2010.
10. Ibid.
11. DSIRE Database of State Incentives for Renewables and Efficiency, *Maryland Incentives/Policies for Renewables & Efficiency, Energy Conservation in State Buildings*, 13 July 2010.
12. Southern Maryland Electric Cooperative, *Lighting*, downloaded from www.smeco.coop/energy/tips/light.html, 4 March 2011.
13. Navigant Consulting, *EmPOWER Maryland 2010 Interim Evaluation Report (Draft)*, 1 December 2010.
14. Maryland Energy Administration, *EmPOWERing Maryland Clean Energy Programs FY 2011 (Draft)*, downloaded from energy.maryland.gov/reports.html, 2 March 2011.
15. Ibid.
16. Maryland Energy Administration, *Comments on the Second Quarter 2010 EmPower Maryland Reports and the Third Quarter 2010 EmPower Maryland Reports. Case Nos. 9153, 9154, 9155, 9156, and 9157*, 17 December 2010.
17. Baltimore Gas & Electric, BGE *Smart Energy Savers Program: Quick Home Energy Check-up*, downloaded from [www.bgesmartenergy.com/residential/heating-cooling](http://bgesmartenergy.com/residential/heating-cooling), 4 March 2011.
18. Delmarva Power and Light, *Quick Home Energy Check-up*, downloaded from homeenergysavings.delmarva.com/md/home-energy-savings/check-up; Pepco, *Quick Home Energy Check-up*, downloaded from homeenergysavings.pepco.com/md/home-energy-savings/home-performance-audit; Baltimore Gas & Electric, *Quick Home Energy Check-up*, downloaded from www.bgesmartenergy.com/residential/quick-home-energy-check, 4 March 2010.
19. See note 14.
20. Malcolm Woolf, Director, Maryland Energy Administration, *Maryland Energy Administration: 2010—The Year in Review*, downloaded from www.energy.state.md.us/2010review.html, 29 September 2011.
21. PJM, *Demand Resources and Energy Efficiency Continue to Grow in PJM's RPM Auction* (press release), 13 May 2011.

22. Ibid.
23. Itron, Inc., *Final Cost-Effectiveness Results for 2009-2010 Energy Efficiency Programs in Maryland (revised draft)*, 9 June 2011.
24. Ibid.
25. U.S. Department of Energy, *National Electric Transmission Congestion Report*, Federal Register, 72: 56992-57028, 5 October 2007.
26. American Electric Power and FirstEnergy Corp. (acting together as Potomac Appalachian Transmission Highline), *PATH Seeks to Withdraw Applications for Electric Transmission Project*, 28 February 2011.
27. Pepco Holdings, Inc., *PHI's MAPP Transmission Line Continues to Add Benefits* (press release), 4 December 2008.
28. Estimated cost per customer is \$0.40 per 1,000 kWh, per Pepco Holdings, Inc., *PHI's MAPP Transmission Line Continues to Add Benefits* (press release), 4 December 2008.
29. Ben Mook, "PJM Interconnection Puts \$2 Billion PATH Line on Hold," *The Daily Record*, 28 February 2011.
30. Assuming cost of \$2.1 billion is split as indicated in Bill Howley, "Who Pays for PATH?" *The Power Line* (blog), downloaded from <http://calhounpowerline.com/who-pays-for-path/>, 21 September 2011.
31. See note 26.
32. Mike Kormos, Senior Vice President, Operations, PJM, letter to David Velazquez, Executive Vice President, Power Delivery, Pepco Holdings, Inc., 18 August 2011.
33. See note 27.
34. Electricity Consumers Resource Council, *The Economic Impacts of the August 2003 Blackout*, 9 February 2004.
35. Jay Hancock, "BGE Pushed Air Conditioner Cutoff Plan Too Far," *The Baltimore Sun*, 26 July 2011.
36. Overnight cost of building natural gas conventional combustion turbine from U.S. Department of Energy, Energy Information Administration, *Updated Capital Cost Estimates for Electricity Generation Plants*, November 2010.
37. Baltimore Gas and Electric, *EmPOWER Maryland Plan for 2012-2014 in Case No. 9154*, 12 August 2011.
38. Jamie Howland and Derek Murrow, Environment Northeast, and Lisa Petraglia and Tyler Comings, Economic Development Research Group, Inc., *Energy Efficiency: Engine of Economic Growth, A Macroeconomic Modeling Assessment*, October 2009.
39. 29.2 job-years per \$1 million invested is the average job creation rate in New England from energy efficiency investments by electric utilities and customers, in a scenario in which neighboring states are not making large efficiency investments. Environment Northeast uses this average figure for Maryland, in Environment Northeast, *Economy-wide Benefit of RGGI: Economic Growth Through Energy Efficiency*, September 2011. Job creation data from utility and customer investment come from Jamie Howland and Derek Murrow, Environment Northeast, and Lisa Petraglia and Tyler Comings, Economic Development Research Group, Inc., *Energy Efficiency: Engine of Economic Growth, A Macroeconomic Modeling Assessment*, October 2009.
40. See note 20.
41. BGE, *EmPOWER Maryland Plan for 2011-2014 in Case No. 9154*, 12 August 2011.
42. Stacey Hirsh, "General Motors Ends Production at Baltimore Plant," *The Baltimore Sun*, 14 May 2005.
43. Jordan Schneider and Elizabeth Ridlington, Frontier Group, and Johanna Neumann, Maryland PIRG Foundation, *Falling Behind on Energy Efficiency: Maryland Risks Missing Its Electricity Savings Goals*, March 2011.
44. Ibid.
45. Ibid.
46. Staff of the Public Service Commission, *Staff Concerns Regarding the Empower Maryland Programs of the Potomac Electric Power Company and the Delmarva Power and Light Company*, 29 July 2011.
47. Maggie Eldridge, et al., American Council for an Energy-Efficient Economy, *Energy Efficiency: The First Fuel for a Clean Energy Future*, February 2008.

