Energy Efficiency in Maryland's Electricity Future

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CONTENTS

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EXECUTIVE SUMMARY

Maryland today faces an unprecedented set of challenges in its electricity markets:

- Electricity rates have roughly doubled in the last three years for most customers
- Generation and transmission capacity shortages loom in the next few years
- Global warming and other environmental threats challenge our habitual dependence on fossil fuels for power generation

To make sure Maryland's electricity service is affordable, reliable, and clean in the coming years, state leadership must reassess past policies governing the electricity sector.

This report lays out the role that improving energy efficiency can play in meeting these new energy and environmental challenges. For this discussion, energy efficiency improvement is defined as reducing the energy required for a given unit of physical work or economic output. Efficiency gains are distinct from load management (short-term reductions in use during peak demand periods) or reductions in energy use from reduced economic activity.

Authored by ACEEE as an independent expert on these issues, this report received substantial input from an Advisory Committee representing a wide range of stakeholder interests. While the report reflects the preponderance of views among Advisory Committee members, it does not necessarily reflect their individual opinions or organizational positions on any given issue.

Energy efficiency is gaining wide recognition as a resource that can reduce energy bills and wholesale prices, defer expensive capacity investments, and cut carbon dioxide emissions. Governors, legislators, and regulators in states as disparate as New Jersey, North Carolina, Illinois, Minnesota, Texas, Nevada, and Washington are making major new commitments to efficiency as the "first fuel" in their clean energy strategies. Maryland's neighbors Pennsylvania, Delaware, New Jersey, New York, and Virginia have all legislated or announced significant new efficiency policies in the past year.

Resource potential studies in many other states have shown that efficiency can meet the majority of new electricity needs over the next 15–25 years. Moderating demand growth in this way not only reduces customer electric bills, it softens wholesale power prices, postpones or eliminates the need for new powerplants, and reduces the cost of meeting carbon dioxide emission targets. It also enables renewable energy to reduce fossil fuel emissions. At today's demand growth rates, it will be difficult to bring enough renewables online to reduce emissions, but by slowing demand growth with efficiency investments, renewables can begin to reduce fossil fuel combustion. Even more importantly, investing in energy efficiency has been shown to stimulate economic growth more effectively than building new powerplants.

While it takes time to realize the full economic potential through such technologies, these programs can begin delivering benefits immediately. By staying active in these markets for the full cycle of equipment replacement, Maryland could reduce its electricity usage substantially.

Maryland has experience with efficiency programs. In the early and mid-1990s, utilities spent millions of dollars on efficiency, saving customers many times those program costs in lower bills. As result, electricity demand grew only 0.8% per year from 1992 to 1998. After efficiency programs ended around 1998, demand growth tripled, rising at 2.4% in the 1998–2004 period. This surge in demand growth has added some $33 million per year to Marylanders' electricity bills at today's rates.

Key Issues and Recommendations

This report directs its recommendations to the following key issues. A major issue we do *not* address is the question of whether to re-regulate Maryland's electricity markets. While this decision may subsequently affect efficiency programs and how they are delivered, re-regulation is a much broader issue that goes far beyond the scope of this report. The Advisory Committee's consensus is that action on energy efficiency can and should be taken immediately, since energy efficiency will produce important benefits for Marylanders regardless of the larger regulatory structure of electricity markets.

The key issues before us are:

Issue #1: Setting efficiency resource targets. More and more states, some 18 at present, have or are developing overall energy savings targets, known as Energy Efficiency Resource Standards (EERS), for their utilities. This wave of EERS action stems from these facts: (a) efficiency costs less than new generation; (b) efficiency reduces customer bills in a time of rising energy prices; (c) efficiency helps prevent blackouts by easing strain on the power grid; (d) efficiency reduces emissions of all air pollutants at one low price; and (e) efficiency investment boosts state economic growth. Targets typically run from 1–2% of total sales per year, with total savings reaching as high as 25% over periods of a decade or more.

We recommend that:

- Maryland's leadership should strongly support the Governor's announced goal of a 15% reduction in per capita electricity use by 2015.
- The administration should extend this goal to achieve larger energy savings past 2015, if economic and environmental analysis justifies doing so. The target should be set to deploy all cost-effective energy efficiency resources through 2020 or 2025.
- Decision-makers should consider setting targets for electricity capacity as well as energy savings. The reliability of the region's electric generation and transmission facilities is driven more by peak demand than by annual electricity consumption, so it is important to seek to reduce peak demand as well as total electric energy use.

Issue #2: Selecting funding mechanisms for energy efficiency. In the past, fully regulated utilities funded and operated efficiency programs, and received cost recovery and other considerations for doing so. Since restructuring, states have funded efficiency in several ways, including traditional utility methods and through public benefits funds, which collect the funds to be used for efficiency programs through uniform charges per kilowatt-hour on all customers.

We recommend that:

- Maryland should use a hybrid of existing utility program funding mechanisms and a public benefit funding approach as the two principal avenues most likely to be effective for channeling significant resources toward utility-sector efficiency programs.
- The state should increase general fund support for state agencies to enable them to play the necessary planning, coordination, and administrative roles.
- Federal and state tax incentives should be used for targeted assistance to supplement core funding.

Issue #3: Defining administrative roles. Regardless of the funding mechanism, a key issue is whether efficiency programs are administered by utilities, state agencies, third parties, or a hybrid mix. States have had success with various models, and Maryland has many options in this regard. Regardless of who administers specific programs, there needs to be long-term resource planning and ongoing, high-level coordination of energy efficiency programs statewide. One entity at the state level needs to take long-term "ownership" of the various efforts needed to meet the state's long term goals for efficiency.

We recommend that:

- A hybrid administrative approach should be used, including traditional utility administration, state agency administration, and third-party administration. For example:
    - Utilities should proceed with currently filed programs and be encouraged to propose additional initiatives aimed at helping to meet savings targets. The Public Service Commission should continue to review, approve, and evaluate utility programs and longer-term resource plans.
    - A state agency, logically the Maryland Energy Administration (MEA), should take a lead role in long-term planning and coordination of energy efficiency programs to make sure that the Governor's savings targets are met and that programs are coordinated effectively. An interagency agreement involving MEA, the Public Service Commission (PSC), Department of Natural Resources (DNR), and Maryland Department of the Environment (MDE) should be drafted to detail the roles and responsibilities in this process.
    - Third parties, such as energy service companies, should be encouraged to participate as contract administrators for utility and state-administered programs, and/or as bidders in resource acquisition processes. The state should consider resource bidding processes to tap private market capabilities to acquire the larger amounts of energy savings that will be needed to meet a robust savings target.

Issue #4: Use of RGGI allowance auction revenues. Maryland's participation in the Regional Greenhouse Gas Initiative (RGGI) creates an additional option for energy efficiency funding. Modeling analysis in RGGI's development showed that increasing investment in energy efficiency would reduce customer bills while lowering carbon allowance prices and improving the regional economy. This would require allocating the proceeds from the sale of a large share of carbon emission allowances to fund efficiency programs, developing complementary efficiency policies for electric utilities, or a mixture of both.

We recommend that:

- The state should go beyond the minimum 25% auction of carbon emission allowances, and should consider a 100% auction policy if economic analysis justifies it. Other RGGI states have decided to auction 100% of allowances, because in today's power markets, allowance prices would be reflected in rates regardless of the allocation fraction. RGGI staff analysis also shows that the more allowances that are auctioned and whose proceeds are spent on energy efficiency, the lower that energy prices, average bills, and carbon prices become.
- RGGI stakeholders are considering setting a reserve price for allowance auctions, and requiring retirement of allowances not purchased at that price. We suggest Maryland consider this approach, to ensure that the state receives a reliable funding level from the process.
- The majority of funds resulting from RGGI allowance auctions should be used for energy efficiency. Analysis performed during the RGGI development process showed that investing allowance proceeds in efficiency produced much larger energy bill reductions than would, for example, simply rebating auction revenues back to customers through rate credits.
- The state should not automatically commingle RGGI allowance funds with traditional utility funding processes. A Public Benefit Fund approach would be preferable to administer RGGI funds. Non-utilities, including state agencies and third parties, should be considered for administration of RGGI-funded efficiency programs.
- While decision-makers should include the potential for RGGI-based funding in planning efficiency programs in Maryland, they should not "put all their eggs in the RGGI basket." It may appear convenient to say that funding will come from anticipated RGGI allowance funds, but those funds are very uncertain, both in the absolute amounts and the uses to which the funds are assigned. RGGI funds thus should be viewed as supplemental rather than foundational.

Next Steps

We suggest that decision-makers consider using the current focus on "fast-track" programs to get some efficiency programs started, while sorting out the details of a strong, long-term savings target, funding mechanisms, and administrative roles. Pressing capacity issues, high electricity prices, and global warming concerns add urgency to the need to get programs going soon.

We recommend that decision-makers consider the following next steps:

- Review and approve efficiency programs filed by electric utilities and judged to be cost-effective, in order to get new efficiency investments up and running in Maryland this year.
- To help ensure that the Governor's 2015 goal is met and to chart the course for further gains, conduct an in-depth efficiency potential study for Maryland and use the results to set energy and capacity targets for electricity savings over a 15-year period, building on the Governor's 15% per capita target for 2015, with the aim of capturing all cost-effective energy efficiency.

- Design and then implement funding mechanisms for energy efficiency, sufficient to support programs over a 15-year period that will reach the savings targets set for the state.
- Consult with key agencies, utilities, and other parties to define administrative roles for efficiency programs, in coordination with designing funding mechanisms, and with the intent of meeting a 15-year set of targets.
- Develop the state's RGGI allowance auction effort in coordination with efficiency policy and program development, and apply available RGGI allowance funds as a supplemental source within the efficiency program structure.

These steps need not be sequential, but should rather proceed in parallel. While some decisions will be contingent on others during this process, it is important to get the overall process going quickly.

INTRODUCTION

The Keith Campbell Foundation commissioned this report as part of a dialogue on the future of Maryland's electricity sector. It is written in the broader context of the environmental imperatives facing the state, chief among which are clean air, restoration of the Chesapeake Bay, and global warming. Electricity policy in the 21st century must also grapple with a new and challenging set of energy market conditions in the regulatory environment that is emerging eight years after Maryland's restructuring legislation was enacted.

Authored by the American Council for an Energy-Efficient Economy, the report was developed with the input of an Advisory Committee, as listed in the Acknowledgments section. The recommendations in this report, while they seek to capture the balance of views expressed by the Advisory Committee, do not necessarily represent official positions or opinions of the Committee members or their organizations.

AUDIENCE

This report is aimed at high level decision-makers in the Governor's office, the General Assembly, and state agencies, as well as utilities, utility customers, and consumer and environmental advocacy organizations.

GOALS AND DRIVING FORCES

This report pursues the following four goals.

- **Summarize the history of efficiency in Maryland's utility sector.** Utility-sector efficiency policies and programs span some two decades of Maryland history, both prior to and after watershed electricity restructuring legislation in 1999.
- **Describe key issues and policy options for addressing them**. Developing a new set of policies and programs for energy efficiency in Maryland's electricity sector will touch on a number of current and emerging issues. This report discusses a variety of choices that exist for addressing these key issues.
- **Define the key decisions Maryland's leadership must make.** The report focuses on four key issues that leadership must resolve in defining the roadmap for energy efficiency in Maryland's electricity future.
- **Provide recommendations on energy efficiency and electricity policy.** The report offers a number of consensus-based recommendations for moving forward toward one or more of the policy scenarios.

The Advisory Committee outlined the following forces as key drivers for this effort.

- **Need and opportunity to reassess electricity policy eight years after restructuring legislation.** Maryland is one of some 25 states that restructured their electricity markets in the last decade. Restructuring has generally consisted of separating power generation and transmission service from retail distribution service, permitting competitive retail electricity service for all customers, and retaining electricity distribution service as a

regulated monopoly. Restructuring was driven by a desire to allow competition to reduce the cost of electricity service while improving customer choices and introducing innovation into the electricity business. In the last three years, unexpected problems have emerged that suggest a significant review of electricity policy is needed. These include:

- **Electricity rate increases.** After more than a decade of flat or declining electricity rates, Maryland ratepayers have seen sharp increases since 2004. Electricity rate increases have been driven largely by wholesale market prices in the PJM market, as rate caps contained in the 1999 restructuring legislation have expired and distribution companies have gone to the market for standard offer electricity service.
- **Projected electricity capacity shortages.** The emergence of electricity restructuring during the 1990s caused a wave of investment in unregulated power generation capacity. Financial turmoil in the wake of the Enron collapse and other market developments has sharply curtailed unregulated or "merchant" power generation investments. With regulated utilities in the region owning very little generation capacity, this has raised concerns about the adequacy of generation capacity in the next several years.
- **Limited customer choice.** While many large customers have been able to find competitive electricity suppliers, the great majority of small customers have not. This leaves most small customers exposed to high energy prices with few alternatives other than reducing consumption to manage their electricity bills. It was also anticipated that restructuring would cause competitive forces to bring forth new energy efficiency services for all customers. This has not manifested itself in Maryland, or in other states.

- **Persistent and intensifying air quality compliance challenges.** Maryland continues to fail to attain federal ambient air quality standards. While progress has been made in several respects through policy advances, Maryland faces new challenges, including meeting a tougher 2009 ozone standard.

- **New global warming commitments**. Maryland has been characterized as among the most vulnerable states to the impacts of global warming. With over 3,000 miles of coastline and substantial land area very close to sea level, Maryland is unusually vulnerable to storm damage and sea level rise. As part of the 2006 Healthy Air Act, Maryland has joined the Regional Greenhouse Gas Initiative (RGGI), a multi-state electric-sector carbon cap-and-trade initiative involving states from Maryland to Maine. The first compliance period begins in 2009, with the ultimate goal being a 10% reduction from 2014 carbon emissions levels by 2018.

The combination of many of the forces outlined above has given rise to increased public interest advocacy on these kinds of energy and environmental issues. Combined with ratepayer concerns about rising rates and elected officials' growing focus on these issues, this has moved electricity policy to the forefront of public policy in Maryland.

History of Electricity and Energy Efficiency in the U.S. and Maryland

Roots of electric-sector efficiency planning and programs. Electric utilities began to develop energy efficiency initiatives in the 1970s, when the combination of high oil prices and high capital costs for new powerplants reversed a century-long trend of falling electricity rates. The engineering economies of scale for conventional power systems peaked about 1970; until then, new powerplants and other system improvements tended to reduce average rates. The 1970s saw a sea-change in this pattern.

During the 1980s, utility commissions and the electricity industry developed a planning framework and related methods for Integrated Resource Planning (IRP), a new paradigm in which a wider set of resource options was considered in planning for electricity needs. The term "demand-side management" (DSM) was coined by the Electric Power Research Institute (EPRI) in the early 1980s to encompass a range of technology, ratemaking, and related practices aimed at developing resources on the demand side of the electricity system. DSM included energy efficiency, load management, time of use rates, and other methods designed to affect customer electricity demand.

Maryland's most significant DSM commitments emerged in the early 1990s as the state's IRP process shaped a new wave of DSM programs. As a result, Maryland utilities spent over $500 million dollars on efficiency programs during the 1990s.

Deregulation in the U.S. electricity industry. Deregulation began in 1978 with the Public Utility Regulatory Policies Act (PURPA), which enabled non-utility generation to sell power to regulated utility systems. Certain renewable energy and combined heat and power facilities began to connect to utility grids in the 1980s under PURPA. The Act also required utility commissions to consider a range of ratemaking practices designed to shape customer loads. The Energy Policy Act of 1992 furthered federal deregulation policies by laying the legal framework for a more fully deregulated generation sector, and for competitive wholesale power markets.

Electricity restructuring moved to the state level and gained momentum following the 1994 publication of the California Public Utility Commission's "Blue Book" report (CPUC 2001) recommending deregulation of the state's retail electricity markets along with other changes. In Europe, restructuring had already begun in countries like the U.K. and Norway, as the fall of the Soviet Union stimulated a broad wave of "market liberalization" policies.

By the turn of the century, some 25 states had opened retail electricity markets to competition, along with a set of related policies that typically separated utility distribution operations from generation and transmission operations. Many policy analysts believed that electricity deregulation should follow the model established by the telecommunications industry, in which local phone service continued to be regulated, while long-distance and other aspects of communications service became more or less fully competitive.

Shifts in efficiency programs in the wake of restructuring. One common element of the wave of state restructuring legislation in the late 1990s was a sharp reduction in utility energy efficiency program activity. From a peak of about $1.6 billion in 1994, utility spending mandated by states

fell to about $800 million in 1998.[1] Beyond simply cutting back spending, most states that remained active in energy efficiency shifted the basis of their efficiency program funding. Backing away from the DSM model where utilities designed, funded, and recovered costs for programs under commission regulations, many states that restructured their electricity markets created Public Benefits Funds (PBFs), which collect program funds through uniform charges per kWh on all customers. These public funds are then administered through utilities, state agencies, or third parties.

Because PBFs did not involve utility cost recovery issues, there was a less intense focus on the cost-effectiveness of each utility's programs. Instead, many states evolved a broader market transformation (MT) approach, in which program designs were aimed at broader geographic areas, and also worked further "upstream" in supply chains, rather than focusing solely on incentives at the retail transaction level, as most DSM programs had done. MT approaches worked more closely with manufacturers, retailers, and other market players to shift product design, labeling, stocking, and promotion practices, often achieving significant market impacts without paying large incentives to individual utility customers.

The MT movement largely coincided with the emergence of the federal ENERGY STAR® labeling and certification program, which created a national platform for high-efficiency products. By using ENERGY STAR efficiency criteria and labeling along with national partnerships among manufacturers and retailers, many states and utilities created effective leverage for their efficiency programs. Rather than each utility setting efficiency criteria and offering its own set of incentives and promotional practices, the ENERGY STAR program network enabled regional and national efforts that reduced program costs while increasing impacts. The Northeast Energy Efficiency Partnerships is a leading example of the kind of regional effort that emerged in this context.

Restructuring and efficiency programs in Maryland. In Maryland, the drop in spending was even more pronounced. Maryland's energy conservation programs collected and spent over $500 million from 1991 through 1998. These programs achieved documented savings of 3.5% of electric sales in 1998, resulting in substantial pollution prevention and customer bill savings. However, virtually all energy efficiency programs were shut down by the end of 1998 with Commission approval. ACEEE's scorecard of utility program spending in 2005 (York and Kushler 2005) found Maryland ranked 44th among the states in utility efficiency spending.

Maryland's electricity usage rose rapidly after efficiency programs were terminated (see Table 1 below). When programs were in full operation, average consumption per customer grew by less than 1%. After 1998, electricity usage grew at a rate about three times the 1992–1998 rate. Residential electricity usage grew 15% in just six years, contributing to high wholesale power prices, blackout risks, and increased emissions of air pollutants and greenhouse gases. Had energy efficiency programs remained active, electricity demand growth could have been substantially lower.

[1] ACEEE staff research, included in several ACEEE reports.

Table 1. Maryland Residential Electricity Usage 1992–2004

1992–1998	
1992 sales per residential customer	921.7 kWh per month
1998 sales per residential customer	968.5 kWh per month
Total increase 1992–1998	5.1 %
Annual increase 1992–1998	***0.83 %***
1998–2004	
1998 sales per residential customer	968.5 kWh per month
2004 sales per residential customer	1,116.7 kWh per month
Total increase 1998–2004	15.3 %
Annual increase 1998–2004	***2.4 %***

Source: electricity sales data from EIA (2005).

The Electric Choice and Restructuring Act of 1999 retained the PSC's statutory ability (7-211) to require utility efficiency programs, and settlements with BGE, Pepco, and Allegheny enabled public benefits charges of up to one mill per kWh for such programs. However, prior to the expiration of rate caps, no utilities chose to propose or spend any significant amounts under these provisions.

The 1999 restructuring bill called for a PSC report on efficiency. Numerous parties filed comments for this report, including ACEEE, the Alliance to Save Energy, and the Northeast Energy Efficiency Partnerships. Advocates proposed a robust set of programs, funded through a public benefits charge. The PSC report (MD PSC 2001), issued in February 2001, recognized the value of efficiency programs, but did not recommend that utility-funded programs be initiated. It suggested that funding should come from general state funds, not utility revenues or related sources, and that a state agency like MEA could be an appropriate program administrator. Governor Glendening also set up an efficiency task force during this period, which gathered a lot of information on these issues, but did not lead to recreation of any programs at that time.

Since the 1999 restructuring legislation, bills calling for Public Benefit Funds for efficiency, which were created in relation to restructuring policies in some 20 states, were introduced each year. Senator Frosh has been a leading sponsor for these efforts.

Rate caps included in the 1999 legislation began to be lifted in 2004, beginning with Pepco customers. Wholesale market conditions in the PJM market, driven primarily by high natural gas prices, drove standard offer as well as competitive prices to levels never seen before in Maryland.

Recent Maryland electricity and energy efficiency policy developments. The controversy over rising rates grew in 2006, as major BGE rate increases loomed with pending expiration of its rate caps. Serving some 50% of customers in the state, BGE's rates affected more customers than any of the previous rate cap expirations. The legislature struggled with solutions, mostly focused on the Standard Offer Service (SOS) procurement process. In the emergency bill passed in June 2006, a provision was included that called on the PSC to consider procuring energy efficiency in the context of SOS procurement. This issue was included in PSC Case 9063 at the Commission later that year, but no conclusions or orders on efficiency have yet resulted from that process.

In the 2007 legislative session, Senator Frosh and Delegate Feldman sponsored SB 562/HB 631, which would have required electric companies, under the guidance of the Public Service Commission, to provide energy efficiency services to residential customers that would save an amount of electricity equal to 12% of their 2006 residential sales by the year 2016, or roughly 1% of residential electric sales each year for the next ten years. The bill called for the creation of a new framework for utility energy efficiency resource planning, partially replacing the IRP framework that was dismantled in Maryland with electricity restructuring. The framework would have included targets for utility energy savings efforts for customers, provided for flexibility in compliance, and helped make energy efficiency a fair business proposition for investor-owned utilities.

SB 562/HB 631 would have created an Energy Efficiency Resource Standard, one of the fastest-growing state energy efficiency policies (see description below). Senate Bill 400, passed in 2007 at the end of the legislative session, called for a major review and reassessment of Maryland's electricity policy, including the possibility of re-regulation. Energy efficiency's role in this process is not well defined in the bill. Even though HB 631 had already passed the House of Delegate, debate on SB 400 caused the Senate Finance Committee to drop SB 562. However, it is expected that energy efficiency will be part of the process launched by SB 400.

In response to rising rates and the more general re-assessment of electricity policy in the wake of restructuring, BGE and Pepco (Maryland Public Service Commission 2007) have both filed to develop new energy efficiency programs. Details are yet to be finalized for public review. Working group meetings occurred in early 2007 among utilities, commission staff, and interested parties to consider issues related to efficiency program development, funding, administration, and evaluation. The Commission held a conference and other proceedings on capacity needs in the summer of 2007. Filings and other documents and references can be found under Case 9111 on the Commission's Web site.[2]

Governor O'Malley's administration is also beginning to address these issues. The Climate Commission is studying them and may produce findings or recommendations.[3] The Governor's July announcement of energy savings targets for state facilities plus a goal to reduce per-capita energy use 15% by 2015 is part of a larger effort to examine energy efficiency as a resource among other options to meet Maryland's energy and environmental challenges.

Maryland's formal entry into RGGI in April has also initiated new activity. The Maryland Department of the Environment, which is responsible for implementation rules and administration of the RGGI program, has begun meeting with stakeholders in preparation for issuing draft rules.

Parallel Energy Efficiency Policy Developments Outside Maryland

In the eight years since Maryland's restructuring legislation, other states' spending on energy efficiency has roughly doubled. ACEEE and other organizations have tracked utility program spending across the U.S. The most recent reports indicate that states are spending over $2.5

[2] http://www.psc.state.md.us/psc/index.htm
[3] http://www.mde.state.md.us/air/mccc/

billion on energy efficiency programs, more than tripling program activity from its 1998 low point.

Energy efficiency as a high-value resource. In the years since restructuring changed the face of many U.S. electricity markets, several states have taken a new look at energy efficiency as a resource. In the past, efficiency was viewed variously as a regulatory requirement for planning purposes, a customer service offering, a social program, or an environmental program. As restructuring swept half the states during the 1990s, efficiency programs faded into the background in many parts of the country.

But as states have had to grapple with the unprecedented energy challenges of the 21st century, efficiency has taken on new value. Rising energy prices that signaled an end to the era of cheap energy, strained electricity grids coping with growing electricity needs, stubborn air quality problems that called for new solutions, and perhaps the ultimate energy and environmental challenge—global warming—have combined to lead states back to energy efficiency.

Efficiency is a unique clean energy resource, providing an unparalleled set of value streams, including:

- Lower energy costs for consumers and businesses
- Reduced strain on power grids, which reduces the risk of blackouts
- Lower emissions for *all* pollutants, including criteria air pollutants as well as carbon dioxide
- Improved state and regional economies

In today's electricity markets, efficiency is reliably less expensive that power from new generation plants. Many states are realizing energy efficiency savings at about 3 cents per kWh, compared with a price of 6–8 cents per kWh from new coal powerplants, and higher rates from other types of plants. Based on these favorable economics, several state studies have shown that efficiency can meet most if not all of the growth in electricity needs over the next two decades, while reducing energy bills, preventing blackouts, reducing pollution, and boosting the local economy. ACEEE recently completed studies in Florida and Texas with results along these lines (Elliott, Eldridge et al. 2007; Elliott, Shipley et al. 2007).
Electricity-sector efficiency programs can come in several forms, but they tend to focus on key technologies and markets, including:

- **New construction markets for homes and commercial buildings**, reducing the "energy footprint" of new buildings by up to 50%
- **Commercial lighting**, which accounts for over 30% of commercial electricity use; modern lighting systems can cut electricity usage by half or more
- **Commercial cooling** systems, where new equipment can be 30–50% more efficient than older systems
- **Residential heating and cooling** systems; a new air conditioner today can reduce cooling bills by 40–50% when replacing a 25-year-old unit

- **Residential appliance and lighting** markets; new refrigerators today use less than one-quarter the energy of models sold 25 years ago while compact fluorescent light bulbs reduce energy use by 75%
- **Insulation, window replacement, and "home sealing"** to weatherize existing homes
- **Low-income programs**, aimed at upgrading low- and moderate-income housing stock and helping families manage energy bills

Energy Efficiency Resource Standards. As they begin to understand the multiple benefits efficiency offers toward meeting their energy and environmental challenges, many states are moving to set quantitative energy savings targets for their utility sector programs. This is a different model from the Public Benefit Fund/market transformation approach most states adopted with their restructuring bills. EERS set targets for results, while public benefits funds set targets for spending. To be sure, many PBF states also set performance targets for their programs, but the EERS approach starts from the results end of the equation. EERS set energy-saving targets for utilities in an aggregate sense, as percentage of electricity sales, typically over a multi-year period. They are intended to serve planning and resource acquisition purposes, filling part of the void left when restructuring eliminated much of the framework in which IRP was conducted.

Fourteen states have EERS in place, and additional states are developing them (Nadel 2006, 2007). The states with EERS in place through law or regulation include:

- Hawaii
- California
- Washington
- Nevada
- Colorado
- Texas
- Minnesota
- Pennsylvania
- Virginia
- New Jersey
- Connecticut
- Vermont
- North Carolina
- Illinois

States with EERS under development include:

- Delaware
- Michigan
- New York
- Massachusetts

Efficiency initiatives in the region. Nearby states have recently acted on efficiency in the following ways.

- **Governor Rendell in Pennsylvania** has announced a new energy plan that calls for some $70 million in new utility spending on energy efficiency, and the Pennsylvania Alternative Energy Portfolio Standard legislation in 2004 included energy efficiency as an eligible resource in utilities' resource acquisition targets, making Pennsylvania one of the eight states with an EERS. The Pennsylvania PUC has also conducted dockets on demand-side resources, including revenue decoupling.
- The **District of Columbia** approved a public benefits fund in its restructuring legislation in 2000. The Renewable Energy Trust Fund began operating programs in 2005–2006. In 2007, Pepco announced an Energy Efficiency Blueprint including a set of efficiency programs.

- In **Virginia**, the re-regulation legislation passed in 2007 includes a 10% EERS target for 2022. The State Corporation Commission has established a work group to focus on the details of implementing this target.
- The **Delaware General Assembly** passed Resolution No. 45 in 2006 to create a task force for the development of a Sustainable Energy Utility (SEU), whose mission would be to deploy energy efficiency, renewable energy, and other low-carbon technologies. In June 2007, the Assembly voted to create the SEU with $30 million in bonding authority. The SEU goals include a target of reaching 33% of electricity customers by 2015, and achieving an average electricity savings of 30% per participant, for a nominal total savings target of 10% by 2015.
- **New Jersey** established a Public Benefit Fund for efficiency in its 1990s restructuring legislation, spending over $100 million annually through the utility-administered Clean Energy Program. Starting in 2003, the governor redesigned the Clean Energy Program for administration through independent third parties. In June 2007, New Jersey passed the Global Warming Response Act, which includes authorization for the Board of Public Utilities to establish an Energy Efficiency Portfolio Standard designed to achieve savings of 20% of electric and natural gas sales in 2020.
- **New York's Governor Spitzer** in May 2007 announced an electricity savings goal of 15% of sales by 2015. This would effectively represent a 2% per year savings target, and would reduce electricity sales in 2015 to 6% below 2006 levels. In total kilowatt-hours, this would be the largest energy savings target set by any state. The state utility commission has just issued a draft plan for achieving this goal.
- **North Carolina's** legislature has passed and the governor has signed a bill that would set energy efficiency and renewable energy targets. The target would reach 12.5% of electricity sales by 2020, with up to 40% of the target able to be met by efficiency.

Developments in wider energy markets. These new state energy efficiency commitments are occurring against a backdrop of fundamental shifts in national and global energy markets. Since 2000, energy markets have evidenced a set of constrained conditions for all conventional energy sources, with strong indications that we will not see a return to the low fossil fuel prices of the 1990s (Elliott 2006). Indications are that geophysical, financial, and other constraints have changed market fundamentals in ways that will not likely be reversed. This implies that Maryland is likely to experience high and volatile prices for all major energy sources for the foreseeable future.

Efficiency elements of national policy initiatives. The federal government has recognized the changing conditions in state electricity markets by establishing the National Action Plan for Energy Efficiency. In 2005, the U.S. Environmental Protection Agency and the U.S. Department of Energy launched the Plan to revitalize state energy efficiency programs in the utility sector. BGE and Pepco have both joined the Plan's leadership committee. The Plan has developed extensive resources for states and utilities to use in advancing efficiency initiatives. A regional implementation workshop was held in Philadelphia in April, with representatives ranging from New York to Virginia. These resources can help guide Maryland's future energy efficiency initiatives.

Energy efficiency components of climate policy. In 2003, nine northeastern governors formed the Regional Greenhouse Gas Initiative. In 2005, seven governors signed a Memorandum of Understanding to move forward with a Model Rule, which was completed in the summer of 2006. The Model Rule requires that at least 25% of carbon allowances be auctioned, with the proceeds to be used for energy efficiency and other strategic carbon reduction approaches. Maryland joined RGGI in 2007, based on the provisions of the Healthy Air Act in 2006. The Department of the Environment, in consultation with other agencies, is beginning the regulation development process for RGGI, in anticipation of the beginning of the first compliance period in 2009.[4]

Developments in distributed resource planning. In 2004, Maryland's utility commission joined five other states in the informal Middle Atlantic Distributed Resource Initiative (MADRI). Recommendations in varying degrees of detail have been produced by working groups in seven areas: interconnection, advanced metering, environmental impacts, demand response, business models, regulatory issues, and consumer awareness. MADRI's numerous analysis and policy development documents can serve as resources for Maryland's future electricity policies.[5]

Key Issues for Maryland's Future Electricity and Energy Efficiency Policy

***Re-regulation*.** Senate Bill 400 will likely cause a significant debate on whether to re-regulate some or all aspects of Maryland's electricity markets. Virginia's 2007 legislation had this effect, and it helped spur the introduction of SB 400. The SB 400 process may result in increased responsibilities for electricity distribution companies, including some or all of the functions they served prior to restructuring.

A primary consideration will be whether to bring existing or new power generation facilities into the regulated ratebase. Frustration was expressed in the 2006 SOS bidding process, when bids from the unregulated owners of powerplants that had once been covered by regulated rates came in substantially higher than their historical operating costs would have indicated. It has proven difficult to get SOS bids in the PJM market that come close to prices that would be established under traditional cost-of-service ratemaking practices. This creates an impetus to bring existing or new powerplants under state commission control to reduce future rates.

Resource planning. A central question in emerging electricity policy debates is whether and how utility commissions can re-create a long-term planning process that considers supply and demand resources in a unified framework. One key issue in such a debate would be whether a "loading order' is established in which efficiency must be acquired before new supply resources are approved for construction or purchase.

Efficiency resource potential. ACEEE, as well as national laboratories and state agencies, has conducted numerous assessments of energy efficiency resource potential. ACEEE's meta-review (Nadel, Shipley et al. 2004) of 11 potential studies, covering several states and regions around the U.S., shows a median achievable potential of 24% of electricity sales. On an annual basis, this 24% potential translates into about 1.2% of electricity sales. Efficiency resources take time to fully realize in the marketplace, because building and equipment stock turns over in cycles

[4] http://www.rggi.org
[5] http://www.energetics.com/madri/

measured in decades as well as years. Therefore, the annual achievable potential is as important as the total potential estimate.

To fully realize efficiency potential in electricity markets, it is vital that efficiency programs stay active in the market for an extended period. It can take 20 years or more to fully realize the 24% potential in the ACEEE review. One of the difficulties of past electric utility efficiency programs is that they have had a short-term, "start-stop" focus, which makes them less effective than is needed to realize efficiency's full potential. More recently, longer-term "market transformation" program approaches have been developed to address this issue.

As an example of the effects that energy efficiency can have on meeting a state's future electricity needs, Figure 1 summarizes an analysis ACEEE performed for Environmental Defense in Texas in February 2007 (Elliott, Eldridge et al. 2007). It shows that most of the forecast load growth in the state can be met cost-effectively through energy efficiency, combined heat and power, and renewable energy.

Figure 1. Meeting Texas' Future Electricity Consumption Needs

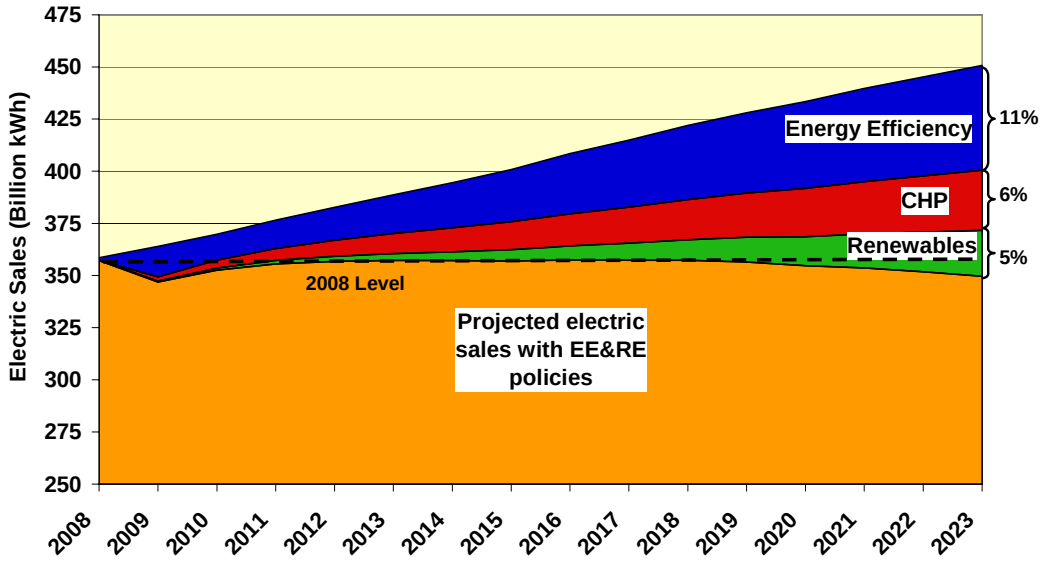
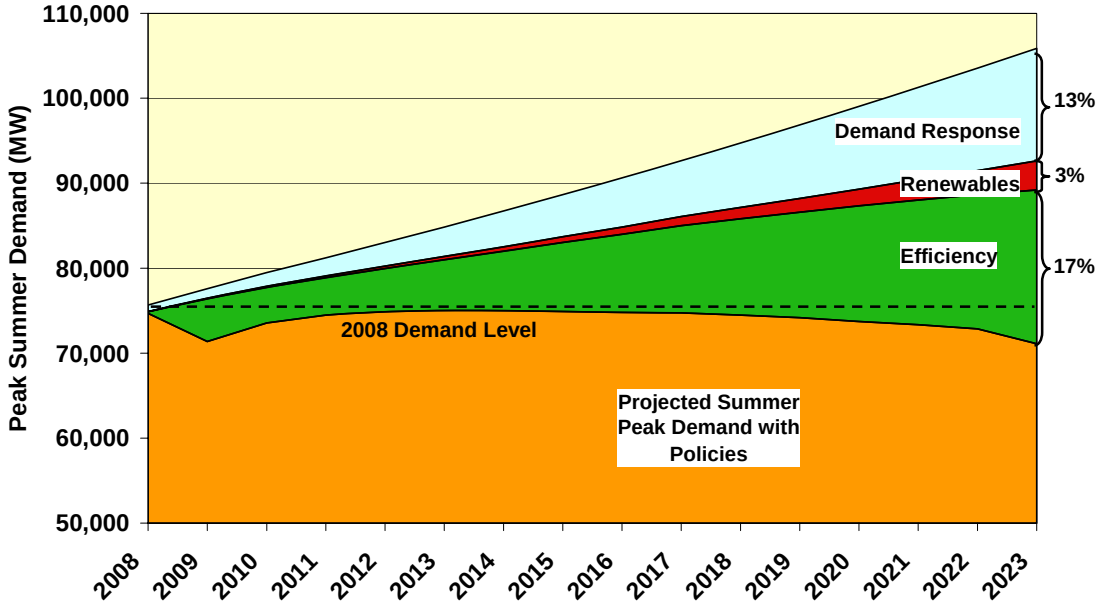


Figure 1 illustrates the effect of efficiency on energy consumption. Efficiency and demand response can also meet the majority of generation capacity needs, as shown in Figure 2.

Figure 2. Meeting Texas' Future Electricity Capacity Needs



Efficiency resource target. As described above, some 18 states have Energy Efficiency Resource Standards in place or under development, and SB 462/HB631 in the 2007 General Assembly would have set an EERS target for Maryland. Governor O'Malley's announcement of a goal to reduce per-capita electricity use 15% by 2015 is an important step toward setting an EERS-type goal. Therefore, a key issue for future policy discussions is whether and at what level Maryland sets quantitative, top-down energy savings targets for utility-sector programs. This issue raises questions on how fast efficiency commitments in Maryland should ramp up, depending on the levels of cost-effective efficiency identified in potential studies, near-term rate impacts, and deliverability limitations, including staff capabilities at the PSC, utilities, and delivery companies.

Public Benefit Fund. Some 20 states operate PBFs; Maryland should decide whether and at what level to create a new state fund that would support energy efficiency programs. The revenue for a Public Benefit Fund could be obtained through universal small charges on utility customer bills, through RGGI allowance auction proceeds, or both.

All current PBF states use universal system benefit charges on bills. The RGGI model rule requires the state to auction at least 25% of all allowances; however, several of the RGGI states intend to auction 100% of the allowances.

Standard offer service. Unless the General Assembly and the PSC decide to re-regulate power generation service, the state's distribution utilities will continue to bear the responsibility for providing SOS electricity to customers who do not or cannot find competitive power suppliers. There remain large questions about how procurement will work in any revised policy framework; the core question for energy efficiency is whether and in what form energy

efficiency is included in SOS procurement processes. The PSC's current case 9063 may address this issue to some degree, although it is not clear whether this case will proceed or be supplanted by other events. It is likely that if efficiency is linked to the standard offer procurement process, the costs of efficiency programs delivered this way would be rolled in SOS rates.

Utility cost recovery and incentive mechanisms. If utilities are asked to achieve significant levels of energy savings, they can experience significant revenue erosion unless mechanisms are created to permit program cost recovery, revenue stability, and shareholder return on investment in efficiency programs. PHI has filed for a revenue decoupling mechanism in a recent filing, which is one way to provide revenue stability. The Public Service Commission will need to consider this set of issues in the context of new utility efficiency program proposals.

Cost-effectiveness methods. In the IRP/DSM era, the PSC used a standard set of cost-effectiveness tests for efficiency programs, based on well-defined costs for electricity generation, transmission, and distribution resources. The California PUC's Standard Practice Manual, used by most states for these purposes, provided clear and consistent methods for several cost-effectiveness tests. When all supply-side resources were regulated, the Commission had access to reliable data, and had an integrated planning framework in which to compare demand-side to supply-side costs. Since restructuring, the PSC no longer regulated generation, and thus does not have access to the same kind of data it formerly used to establish avoided costs.

In a post-restructuring policy environment, the PSC will need to develop a new framework for cost-effectiveness analysis. If the PSC does not develop a framework that takes into account the full set of benefits for efficiency, including avoided generation, transmission, and distribution costs, and does not develop a reasonable set of terms for cost-effectiveness tests, Maryland may not receive the full value of efficiency resources for its electricity future. The cost-effective tests still apply; the challenge is to define a new basis for key terms such as avoided generation costs. Cost-effectiveness assessments could be used to determine overall efficiency potential, and also to screen and prioritize specific programs.

One way to do this is to simply use SOS prices as a proxy for avoided generation costs. BGE used this approach in its recent assessments of residential efficiency programs. This is a simple approach, and the data is readily available. Its limitation is that the data is historical rather than prospective, and may not be particularly accurate beyond the terms of current SOS contracts.

Statewide rulemaking with individual company implementation vs. individual company PSC action on efficiency initiatives. In the past, the PSC would typically treat individual utility programs entirely separately, with separate dockets and orders for each company's filings. A core issue going forward is whether to develop and administer some or all efficiency programs on a statewide basis (possibly developing not only standard practices but also standard programs), using a single proceeding, and apply other consistent practices for cost recovery, monitoring and verification, etc., or to take the historical approach of handling individual company filings as distinct, without general rules or statewide consistency for programs.

Role of non-utility parties in efficiency programs. Over the past decade, states have tried various approaches to efficiency program administration: traditional utility administration, state

agency administration, and third-party administration. ACEEE research indicates that all three approaches can work if considered carefully and supported with adequate funding and institutional commitment. In Maryland, some parties advocate getting utilities out of program administration completely; at present, some utilities appear to want to administer programs directly; a hybrid approach is also possible, in which the PSC sets overall direction and policies, and non-utility parties deliver some part of the program portfolio. For example, in Connecticut, utilities administer public benefits programs, and they also must meet energy savings targets under the expanded RPS law. Third parties are lining up to arrange efficiency projects for delivery into an efficiency credit market as savings targets exceed the impacts from public benefits programs. In California, about 20% of public benefits funds are administered through third parties.

Relation of utility efficiency programs to RGGI. As described above, the RGGI program will likely create a sizeable fund that can be used for energy efficiency investment; it remains to be seen whether utilities, a state entity, or other parties administer the bulk of these funds. Analysis done for the regional RGGI Working Group, as well as the study performed by the University of Maryland team under the terms of the Healthy Air Act, shows that increased energy efficiency investment lowers the cost of RGGI compliance (Prindle, Shipley et al. 2006). Regional analysis also shows that efficiency reduces emissions leakage, both by reducing energy use in the state, which reduces power imports, and by reducing marginal electricity prices, which also reduces imports. It is therefore important that RGGI be accompanied by aggressive and effective efficiency programs, and the use of RGGI allowance proceeds should thus be administered so as to produce maximum benefits.

Relationship between efficiency and renewables in future policies. There is growing recognition of the synergies that can be achieved by pursuing energy efficiency and renewable energy in a coordinated fashion ((Prindle, Eldridge et al. 2007). This can occur at the micro level: for example, by combining aggressive efficiency with solar PV in a zero-energy home design. It can also occur at a high policy level: several states have efficiency (EERS) requirements built into their RPS laws, and others set efficiency targets in parallel to renewables targets with no direct connection. In Pennsylvania, for example, Tier I of its AEPS consists of "pure" renewables; efficiency is an eligible resource in Tier II. Maryland's current RPS could be amended to create an additional tier of resources for efficiency.

Future building energy codes. Advanced building codes can be used to help limit future demand growth. In California, codes are now based on time-dependent valuation of energy savings, where peak-demand impacts get substantial additional credit in a performance-based system. Maryland could adapt future building codes to maximize electricity savings as well as overall energy use, and could also give added emphasis to peak demand reduction.

Regional consideration of efficiency in the RTO framework. The PJM Regional Transmission Organization is an important part of the state's electricity system. It operates the transmission system as well as wholesale power markets, and is responsible for maintaining system reliability. PJM has also been under growing pressure from the Federal Energy Regulatory Commission and states in the region to become more active in developing distributed energy resources. The MADRI initiative has actively engaged PJM staff in these issues, and several promising efforts

have begun to emerge from those discussions. A core question is whether and how energy efficiency can be considered along with (and provide workable alternatives to) generation or transmission projects.

This issue could include defining the role of Maryland efficiency resources in PJM forward capacity markets and transmission planning processes. The New England transmission system operator recently launched a forward capacity market, in which energy efficiency and other demand-side resources have been enabled to bid. PJM could follow this model, and this should be part of Maryland's electricity policy.

Defining the balance between energy efficiency and demand response. In recent years, there has been growing interest in demand response, or real-time shifts or reductions in peak loads, as well as energy efficiency, which tends to a more general effect of reducing energy use across the annual load curve. Even though potential studies show that many efficiency programs can have significant peak load impacts, and some demand response programs have shown modest efficiency effects, there are few robust and systematic effects to define an optimum balance of utility investment in demand response and energy efficiency in an integrated framework. Because utility system economics tend to favor demand response, there is often a bias toward investing more in this type of program; such assessments should encompass a balanced comparison of efficiency and demand response options, to provide the maximum net benefits to all parties.

Defining the roles of government entities. Since the restructuring legislation cut back the roles of the executive branch in regulating electricity markets, a fundamental issue for the future of energy efficiency in Maryland is the roles of the Governor, the PSC, and/or MEA in charting future policies and programs. The initial scope of the DSM working group, as established by Commission Order, includes only advanced metering and demand response. Future efforts should include efficiency, and the roles of public agencies should be more broadly defined. This report suggests options for various agencies to become engaged in these issues.

The Key Choices for Energy Efficiency in Maryland's Electricity Future

This section focuses on the few key choices Maryland policymakers must resolve that will determine what role energy efficiency plays in the state's electricity sector. Derived from the key issues outlined in the previous section, this "short list" of key decisions reflects the advisory group's consensus.

One of the major decisions on Maryland's electricity future will be the state's policy on electric utility regulation, which SB 400 calls on state leaders to reassess. Some states, including Virginia, Montana, and California, have elected to re-regulate some aspects of retail electricity markets. While this fundamental decision would strongly affect many aspects of electricity service in Maryland, including energy efficiency, this report does not address it specifically. The Advisory Committee's consensus is that this issue reaches so far beyond energy efficiency that it would not be meaningful to attempt to determine the specific effects of such a sweeping decision on energy efficiency program regulation, design, and administration.

Issue #1: Setting efficiency resource targets. Experience in other states suggests that setting an ambitious, long-term energy savings target for electricity markets is a critical first step that drives many other decisions on program design, implementation, and a host of regulatory and administrative issues. In this context, an "ambitious" target seeks to acquire most of the achievable, cost-effective efficiency potential in the state's retail electricity markets.

Governor O'Malley recently announced a goal to reduce per-capital energy use in Maryland 15% by 2015. Assuming that population will continue to grow, this per-capital goal is estimated to reduce total electricity usage by about 10% in 2015, compared to a business-as-usual forecast. Governor O'Malley's goal is comparable to goals set by other governors and legislatures, such as:

- **Virginia.** The re-regulation bill, as amended by Governor Kaine, sets a target to reduce electricity usage 10% by 2022.
- **Delaware.** The Sustainable Energy Utility legislation sets a goal that would effectively reduce energy usage by about 10% in 2015, compared to current forecasts.
- **New Jersey.** The governor's energy plan, and the 2007 Global Warming Response Act, enables an Energy Efficiency Resource Standard that would reduce electricity usage 20% below current forecasts by 2020.
- **New York.** The governor's May 2007 announcement calls for a 15% reduction in electricity usage in 2015. The Public Service Commission has begun a docket to implement this goal in regulations.

The Governor's goal appears to be very close to the Delaware goal, more stringent than the Virginia goal, and less stringent than the New York and New Jersey goals.

In the General Assembly, HB 631 passed in 2007 with a 2016 energy savings target of 12% of 2006 electricity sales for residential customers. The state climate commission may also be setting goals in this regard. Environment Maryland's *Blueprint for Action: Policy Options for Reducing Maryland's Contribution to Global Warming* (Environment Maryland 2007) called for statewide utility sector savings of 6.5% in 2020 compared to reference forecasts; for comparative clarity, this target would save more total energy than the residential-only 12% target in HB 631.

The level and timeframe for efficiency savings targets determine many aspects of state policy for efficiency, including the types of programs and procurement mechanisms used to acquire the resource, the roles of various parties in program development and administration, and the way costs and other aspects of programs are treated from a regulatory point of view.

Generally speaking, the more aggressive the efficiency goal, the more entities will need to be involved, as conventional approaches prove inadequate to meet the higher targets. Also, the greater the impact on utility revenues, the greater the need to revise utility regulatory policy to ensure that utilities are kept financially whole.

Issue #2: Selecting funding mechanisms. The means of paying for public investment in energy efficiency has proven to be a key decision. The principal options in use today are:

1. *Utility funding*. This is the traditional "DSM" approach, in which investor-owned utilities provide up-front funding for efficiency programs, and then recover costs in a regulated mechanism. This approach implies that utilities are the primary if not sole funders and administrators for efficiency programs.
2. *Public benefit funding*. A Public Benefit Fund, while it is typically collected through utility bills through small, universal charges, is a state-owned fund that can be administered through various parties, from utilities to state agencies and third-party administrators.
3. *General fund appropriations*. This would involve funds appropriated through the state budgeting process, and would most likely involve state agency administration of programs.
4. *Tax incentives*. From 2000 to 2005, the Maryland Clean Energy Incentives Act exempted a number of energy efficiency and other clean energy technologies from state sales tax, as well as creating other incentives. A green building tax incentive was also created to encourage high-performance commercial building design. Such incentives could be used to provide financial incentives for a range of efficiency technologies.
5. *Emission allowance auction revenues*. Maryland, as a member of the Regional Greenhouse Gas initiative, is obligated to auction at least 25% of carbon dioxide emission allowances, and use the funds for purposes than can include energy efficiency programs.

These mechanisms are not mutually exclusive. Some states (like California) combine utility funding and public benefit funding, and also provide funding for programs run through state energy offices. Connecticut has public benefit funding, and also requires utilities to meet an EERS target, and is planning to auction 100% of RGGI allowances and use most of the proceeds for energy efficiency.

Based on the June 2006 utility legislation, the Commission is directed to "require or allow" utilities to procure energy efficiency along with Standard Offer Service. This could become another way that efficiency resources are acquired and funded. Presumably, if efficiency is procured in the SOS context, costs would be recovered through SOS rates, though how this relates to traditional utility efficiency program funding remains undecided.

As with issue #1, it is generally true that the larger the savings goal, the more likely it is that multiple funding mechanisms may be needed to tap the best mix of market opportunities and program approaches.

Issue #3: Defining administrative roles. Several state agencies and other organizations could have a justifiable role in the regulatory review, design, implementation, and evaluation of efficiency programs in Maryland. Key entities include:

- *The Public Service Commission.* The PSC has historically regulated, reviewed, and approved cost recovery and other aspects of utility efficiency programs.
- *The Energy Administration.* MEA has played an active role in several efficiency programs over the years.

- *The Department of the Environment*. As the lead RGGI agency, MDE will be involved in the allowance auction process, and the disposition of allowance proceeds, that could become a source of efficiency funding.
- *The Department of Natural Resources*. DNR has roles in powerplant and other energy facility siting, and a variety of resource assessment and resource conservation roles.
- *Investor-owned utilities (IOUs*). The utilities have historically funded and administered most of Maryland's electricity efficiency programs. Cooperatives and municipal utilities have also played roles in efficiency programs, but are not under state jurisdiction for this issue.
- *Energy service companies*. These include companies that entrepreneurially develop energy efficiency projects at customer facilities, arranging all aspects of project development so that customers need not invest any upfront capital, and companies that provide fee-based services for administering utility-funded or publicly funded efficiency programs.

The possible combinations of roles among these parties are numerous. If regulated utilities are involved in efficiency programs, the PSC will need to be involved. MEA could play a number of leading and supporting roles. MDE will need to be involved in RGGI-related aspects of efficiency programming, notably the use of allowance auction proceeds. DNR can play a number of planning, assessment, and other supporting roles. IOUs were lead administrators for efficiency programs prior to restructuring, and some have filed program proposals for new initiatives. Energy service companies can play supporting roles, as contractors to utilities or other program administrators, or a more direct role if a direct efficiency procurement mechanism is developed.

Issue #4: Use of RGGI allowance auction revenues. There are three key aspects of the RGGI auction issue.

a. *Percentage of allowances to be auctioned.* Under RGGI rules, the state must allocate at least 25% of allowances to public auction, with the proceeds to be used for "consumer benefit or strategic energy purposes." In the RGGI development process, there were convincing economic analysis and modeling showing that giving allowances to unregulated generators for free is not in the public interest. The analysis, by Resources for the Future, showed that in regions such as PJM where carbon allowance prices become embedded in wholesale power prices, generators earn extra revenue regardless of how allowances are allocated. This fact was borne out by reports from the emissions trading markets in the UK and Germany as the RGGI rule was being developed. This combination of analysis and market experience convinced the staff that a substantial fraction of allowances should be auctioned rather than given to generators. At present, New York, Vermont, Connecticut, and Maine have committed to auctioning 100% of their RGGI allowances.

b. *Use of allowance auction funds.* The second question about RGGI allowances is how they will be used. The model rule language is very general, giving RGGI state administrators considerable leeway in how the funds are used. While most RGGI state implementation efforts have indicated a strong commitment to using allowance funds for

energy efficiency, it remains to be seen how much of these funds will actually flow to efficiency programs.

There is a good analytical case for using the bulk of auction proceeds for efficiency programs. Staff analysis during the RGGI rule development process showed that average electric bills would be 3–12 times lower, depending on the year and the customer type, than simply rebating auction proceeds through electric bill credits. Certain parties, including large industrial energy users, have tended to oppose use of auction proceeds for efficiency, and support direct rebates. Others point to the analytic findings that show customers overall are better off when funds are used for broad-based efficiency.

c. *Carbon prices.* The third question about RGGI funds is the carbon prices that will actually be experienced. Some analysis indicates that initial prices could be quite low, in the $1–3 per ton range. If that is the case, allowance proceeds are unlikely to provide enough funds to meet the needs of programs aimed at reaching ambitious savings targets.

This information would suggest that Maryland consider exceeding the minimum allowance auction threshold, and dedicating the majority of the funds to energy efficiency. Further University of Maryland analysis should be available soon to assess the relative impacts of auctioning different fractions of the total carbon allowances.

Maryland is expected to receive some 38 million emission allowances under the RGGI program. Assuming a range of carbon prices from $3–7 per ton, that could produce revenues of $117–266 million per auction. This creates a potentially large source of funding for efficiency. As a point of reference, the peak year for efficiency spending in Maryland in the 1990s totaled about $120 million in cost recovery.

RECOMMENDATIONS

This section of the report recommends key principles and policies for the advancement of energy efficiency for Maryland's electricity future, using the four key issues framed in the previous section.

Issue #1: Setting efficiency resource targets. We recommend that:

- Maryland's leadership should build on the Governor's announced goal of a 15% reduction in per capita energy use by 2015.
- The administration should study this important issue further, with the intent of extending this goal to achieve larger energy savings past 2015, if economic and environmental analysis justifies doing so. Toward this end, it would be helpful to conduct an in-depth demand-side resource analysis to better quantify the potential to use energy efficiency, demand response, and distributed generation to meet a substantial portion of Maryland's future electricity needs.
- Maryland, like many other states have done, should set its energy savings target in a range designed to acquire the maximum achievable efficiency resource. This also implies that the target be long term, setting goals extending 15 years or longer.

- Decision-makers should consider setting targets for electricity capacity as well as energy savings. The need for electric generation and transmission facilities is driven more by peak demand than by energy usage, so it can be important to seek to reduce peak demand as well as total energy use.

Beyond setting an overall savings target, it is important that Maryland's future energy efficiency programs draw on the recent experience of other states to design and deliver programs that will be both effective and cost-effective. Fortunately, other states' experience offers a wealth of examples Maryland can use toward this end.

Other states' experience indicates that effective program portfolios should be designed to capture "lost opportunities." Lost opportunities are key points in market cycles where long-lasting decisions are made on energy efficiency; if efficiency programs don't reach these market "gateways" effectively, they will lose the largest and most cost-effective efficiency opportunities.

The first lost-opportunity market that must be addressed is new construction, because not only are new buildings the largest source of demand growth on the grid, building design decisions offer efficiency opportunities that may never be feasible or cost-effective later. The building's geometry and orientation, thermal performance of the building envelope, and the sizing of HVAC systems are key decisions made in the design phase that cannot be easily "undone" later. Yet whole-building design solutions have been able to produce new buildings with drastically reduced energy loads, to the point that HVAC systems are downsized and the net capital cost of the building is reduced.

Equipment and appliance replacement markets are the other major lost-opportunity market. Once buildings are built, their HVAC equipment and appliances are periodically replaced. These replacement cycles are lost opportunities, as it is not often cost-effective to replace large pieces of equipment in mid-life-cycle.

Retrofit measures are the other major focus for efficiency programs. Lighting, air leakage, duct sealing, insulation, and controls are often very cost-effective to install, regardless of the life cycle of the existing equipment or components.

The most common types of efficiency programs include:

- **New construction programs for homes and commercial buildings**, providing design assistance, capital incentives and commissioning; working through builders, developers, architects, engineers, and contractors
- **Commercial lighting programs**, typically seeking to replace existing lighting with high-efficiency lamps, fixtures, and controls
- **Commercial cooling programs**, focused on replacement markets for cooling equipment, systems, and controls, working through design professionals and contractors
- **Residential heating and cooling programs,** typically aimed at replacement markets for air conditioners, heat pumps, furnaces and boilers, working through heating and cooling contractors

- **Residential appliance and lighting programs,** which tend to work with major retailers, often building incentives into product pricing and using point of sale promotion and education
- **Insulation, window replacement, and "home sealing"** to weatherize existing homes, working through contractors and energy specialists
- **Low-income programs**, aimed at upgrading low- and moderate-income housing stock and helping families manage energy bills

Keys to success in these programs include: targeting the right points in the market, where customers or trade allies are making key decisions; keeping the program simple from the customer's viewpoint, so it is easy to participate; offering incentives where needed and effective in getting customers to choose efficient options; and working effectively with trade allies, the business participants in target markets whose cooperation can make or break the success of the program.

As an illustration of current utility offerings, BGE has begun its "fast-track" programs, aimed at residential lighting, appliances, and room air conditioners. These programs can be launched quickly and can achieve relatively high participation in a short time. A more complete portfolio would ultimately include all the kinds of programs listed above

Issue #2: Defining funding mechanisms. We recommend that:

- Decision-makers should use a hybrid of existing utility program funding mechanisms and a public-benefit funding approach as the two principal avenues most likely to be effective for channeling significant resources toward utility-sector efficiency programs.
- The state should increase general fund support for state agencies to enable them to play the necessary planning, coordination, and administration roles.
- Maryland should use federal and state tax incentives for targeted investment assistance to supplement core funding.

Since utilities have already begun programs in the traditional utility funding context, it is unlikely that these efforts will be abruptly discontinued. However, these programs are unlikely to meet the Governor's more ambitious savings goal. It thus remains to be decided what funding sources should to be used for meeting these larger efficiency targets. Also, if RGGI allowance auction proceeds are to be used for energy efficiency, it must be decided how those funds will be handled. We recommend a Public Benefit Fund as a proven way to channel such funds.

Issue #3. Defining administrative roles. We recommend that:

- A hybrid administration approach should be used, including traditional utility administration, state agency administration, and third-party administration. For example:
    - A state agency, logically the Maryland Energy Administration, should take a lead role in long-term planning and coordination of energy efficiency programs, to make sure that savings targets are met over time and that programs are coordinated effectively. An interagency agreement involving MEA, the PSC,

DNR, and MDE should be drafted to detail the roles and responsibilities in this process.
    - Utilities should proceed with currently filed programs and be encouraged to propose additional initiatives aimed at helping to meet savings targets. The Public Service Commission should continue to review, approve, and evaluate utility programs and longer-term resource plans.
    - Third parties, such as energy service companies, should be encouraged to participate as contract administrators for utility and state-administered programs and/or as bidders in resource acquisition processes. The state should consider resource bidding processes to tap private market capabilities to acquire the larger amounts of energy savings that will be needed to meet a robust savings target.
- The state should not automatically commingle RGGI allowance funds with traditional utility funding processes. A Public Benefit Fund approach would be preferable to administer RGGI funds. Non-utilities, including state agencies and third parties, should be considered for administration of RGGI-funded efficiency programs.

Experience in other states has shown that it is important to establish ongoing, high-level resource planning and coordination of energy efficiency programs statewide, regardless of who administers specific programs. Some entity at the state level needs to take long-term "ownership" of the various efforts needed to meet the state's long-term goals for efficiency. One valid criticism of past utility efficiency programs is that they varied by geography, calendar, and specifics. This led to considerable confusion among customers and trade allies, and limited the effectiveness of programs. Maryland need not recreate such problems.

In terms of timing, we suggest that decision-makers consider using the current focus on "fast-track" programs to get some programs started, while sorting out the details of setting a strong, long-term savings target, funding mechanisms, and administrative roles. Pressing capacity issues, high electricity prices, and global warming concerns add urgency to the need to get programs going soon.

Funding mechanisms and administrative roles are somewhat intertwined, and so until the funding issues are clarified, there is a limit to the detail one can assign to the roles various entities will play in implementing programs. We observe, however, that the more ambitious the overall savings goal, the more entities may need to become involved in order to use all effective channels. If the state were not to go beyond the current "fast-track" level of effort, utility administration may be sufficient. But to reach the Governor's goal of 15% reduction in per capital energy use by 2015 may require a more diverse and coordinated effort.

In the last decade, effective approaches have been developed for statewide and regional coordination of programs. California has developed the statewide "Flex Your Power" program, with an active Web site and other channels, to keep the state's many programs in a single context so customers and trade allies can easily understand them. New Jersey's Clean Energy Program coordinates program delivery and communications statewide under the direction of the Board of Public Utilities, and the Delaware Sustainable Energy Utility is expected to coordinate all efforts in the state, working with the state energy office.

To help in comparing the various approaches, we offer the following "pros and cons" for the three main administrative channels—traditional utility programs, state agencies, and third-party administration.

Program Administration Model	Pros	Cons
Traditional Utility DSM	• Best-known approach • Utilities have established admin systems • Funding cannot be "raided"	• Regulatory processes can be lengthy and cumbersome. • Utility financial interests may not be aligned with major efficiency investments. • Reduces flexibility to use other channels for resource acquisition.
State Agency Administration	• Agencies' goals can be more easily aligned with public interest • Agencies can take longer-term focus • Lack of profit basis can reduce program costs	• Agency funds can be raided in tough fiscal times. • Public procurement and other admin. rules can be cumbersome. • Not all agencies are well qualified for large scale program delivery.
Third Party Administration	• Delivery agents' interests can be controlled contractually to align with policy goals • Harder to raid funds under third-party control • Growing capabilities of larger companies in this field indicate competence for sustained program delivery	• Need to build delivery capability—can add time and cost for startup. • Program success highly dependent on competence of contractors. • Third-party delivery less well proven for large-scale resource acquisition.

Issue #4: Use of RGGI allowance auction revenues. We recommend that:

- The state should go beyond the minimum 25% auction of carbon emission allowances, and should consider a 100% auction policy if economic analysis justifies it. Other RGGI states have decided to auction 100% of allowances, because in today's power markets, allowance prices would be reflected in rates regardless of the allocation fraction. RGGI staff analysis also shows that the more allowances that are auctioned and whose proceeds are spent on energy efficiency, the lower that energy prices, average bills, and carbon prices become.
- RGGI stakeholders are considering setting a reserve price for allowance auctions, and requiring retirement of allowances not purchased at that price. We suggest Maryland consider this approach, to ensure that the state receive a reliable funding level from the process.
- The majority of funds resulting from RGGI allowance auctions should be used for energy efficiency. Analysis performed during the RGGI development process showed that investing allowance proceeds in efficiency produced much larger energy bill reductions than would, for example, simply rebating auction revenues back to customers through rate credits.

- Decision-makers, while they should include the potential for RGGI-based funding in planning efficiency programs in Maryland, should not "put all their eggs in the RGGI basket." It may appear convenient to say that funding will come from anticipated RGGI allowance funds, but those funds are very uncertain, both in the absolute amounts and the uses to which the funds are assigned. RGGI funds thus should be viewed as supplemental rather than foundational.

The University of Maryland study team is expected to produce additional analysis that will examine the impacts of different levels of RGGI allowance allocation, including 100%. We suggest that once that analysis is available, decision-makers consider it as another source of guidance for setting RGGI allocation policy. If this analysis shows that customer electric bills would be lowest under a 100% allocation policy, we suggest the state should pursue such a policy.

We also point out that the RGGI program has a nine-year compliance calendar, from 2009 to 2018. This provides substantial temporal flexibility, which can allow the state to use RGGI funds in the early years to address key transitional issues, and then allocate funds to other purposes in later years. By the same token, however, RGGI funds will not begin to flow until 2009, and their total amounts will not be known until the auctions occur.

Next steps. We recommend that decision-makers consider the following next steps:

- Conduct an in-depth efficiency potential study for Maryland, and use the results to set energy and capacity targets for electricity savings over a 15-year period, building on the Governor's 15% per capita target for 2015, with the aim of capturing all cost-effective energy efficiency.
- Design and then implement funding mechanisms for energy efficiency, sufficient to support programs over a 15-year period that will reach the savings targets set for the state.
- Consult with key agencies, utilities, and other parties to define administrative roles for efficiency programs, in coordination with designing funding mechanisms, and with the intent of meeting a 15-year set of targets.
- Develop the state's RGGI allowance auction effort in coordination with efficiency policy and program development, and apply available RGGI allowance funds as a supplemental source within the efficiency program structure.

These steps need not be sequential, but should rather proceed in parallel. While some decisions will be contingent on others during this process, it is important to get the overall process going quickly.

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