

**PLAN TO REDUCE PER CAPITA ELECTRICITY  
CONSUMPTION IN MARYLAND BY 15% BY 2015**

**Lead Agency: Maryland Energy Administration**

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## **PLAN TO REDUCE PER CAPITA ELECTRICITY CONSUMPTION IN MARYLAND BY 15% BY 2015**

In July, 2007, Governor O'Malley launched the EmPOWER Maryland program to address the urgent need to ensure adequate electricity supply and reduce household bills. The primary objective of EmPOWER Maryland is to provide affordable, reliable, and clean energy for consumers in Maryland. The first goal of the program is a 15% reduction in projected peak demand by 2015; the second goal is a 15% reduction in per capita electricity consumption by 2015. This ambitious target doesn't just reduce the growth in electricity use; it actually sets a target to cut the overall consumption of electricity in the face of expected population growth and economic expansion.

The implementation of the EmPOWER Maryland electricity reductions goals moves Maryland from the bottom in energy efficiency efforts at the end of 2006 to one of the top 15 states in the country today. As energy savings accumulate through the EmPOWER Maryland program there will be a reduced need for construction of power plants in the region which will have a direct and positive impact on preventing additional pollution in the Chesapeake Bay. Thousands of new green jobs will result from the many energy-related programs implemented by utilities and state agencies.

The EmPOWER Maryland initiative relies on both the electric utilities and state programs. First, the utilities are implementing a series of programs for residential, commercial, governmental, and industrial sectors to employ energy efficiency and peak demand reduction strategies to reduce the overall consumption of electricity in Maryland. These programs are supported by State programs that are designed to lead by example: by significantly expanding the use of energy performance contracts to make state buildings more efficient, expanding energy loan programs, improving state building operations, installing solar arrays, and purchasing energy efficient products. MEA is also implementing a series of residential energy efficiency programs aimed at improving the efficiency of existing homes as well as working with the affordable housing community to renovate homes to higher level of efficiency.

These commitments are based on the recognition that energy efficiency is a resource that can reduce energy bills and wholesale prices, defer costly power plant investments and cut carbon dioxide emissions.

It should be noted that the breadth and depth of programs and incentives MEA uses to support EmPOWER Maryland has recently expanded significantly due to federal funding through the American Recovery and Reinvestment Act (ARRA), coupled with funding from the Strategic Energy Investment Fund (SEIF). Through ARRA, Maryland is receiving over \$104 million for energy programs. The SEIF expands the ARRA funding for energy advancements through quarterly auctions that sell off carbon allowances and deliver funding to the participating States for environmental and energy related programs to benefit the environment and the public. Through the leadership of Governor O'Malley, Maryland is one of ten participating States in these auctions.

### **Sub-Goal 1: Reduce Per Capita Peak Demand 5% by 2011, 10% by 2013 & 15% by 2015**

Legislators required in the EmPOWER Maryland Bill, that the State's electric utility companies implement cost-effective demand response programs. The utilities' programs are required to achieve a reduction of 5% by 2011, 10% by 2013, and 15% by 2015, in per capita peak demand of electricity.

#### **Maryland's Principle Utility Companies:**

**Baltimore Gas and Electric-** provides service to Baltimore and central Maryland

**PEPCO-** provider to customers in Washington, DC, and Montgomery and Prince George's counties

**SMECO-** Provides service to Charles and St. Mary's counties, and portions of Calvert and Prince George's counties

**Alleghany Power-**provides service to Western Maryland

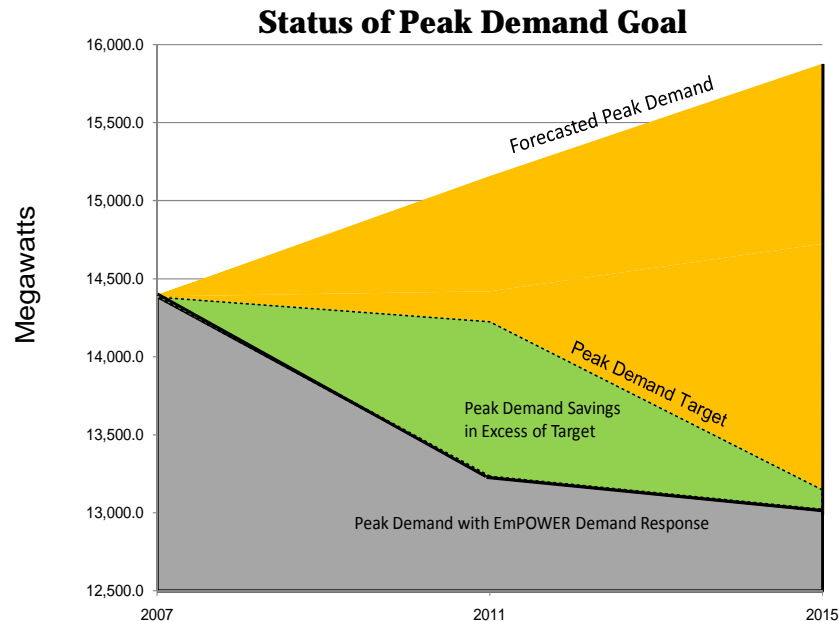
**Delmarva Power and Light** – a subsidiary of PHI (Pepco Holdings), the parent company of Pepco

## Strategy: Utility Peak Demand Initiatives

Through guidance from MEA and regulatory authority by the Public Service Commission (PSC), Maryland's utility companies are offering peak rewards programs for residential, commercial, governmental and industrial sectors to reduce Maryland's electricity demands during peak time periods. The programs reduce electricity loads during peak times by either shutting-down or cycling select equipment, thereby lessening the overall demand for electricity. Monthly incentives or payment are provided to the consumer for the installation of interruptible load devices. In residential homes, the interruptible load devices are placed on air conditioners and hot water heaters. For the industrial, commercial and governmental sectors, major electric equipment is cycled or shut-down during peak times. All of the utility demand initiatives for residential, commercial and industrial sectors are the same in that they remove electrical load during peak times.

## Measures: Utility Peak Demand Initiatives

As directed in the EmPOWER Maryland Act of 2008, the Public Service Commission and the Maryland utilities are responsible for achieving all of the peak demand savings in the State. Over the past year, the utilities have developed demand reduction programs that, if fully implemented, will exceed the legislative target set for 2011 by 216 percent. In 2015 the utilities project the peak demand reduction target will be exceeded by 110 percent. The following chart represents the peak demand projections estimated by the Maryland utilities in 2011 and 2015.



2011 Proposed Savings of 1,933 MW; equivalent of 3 new power plants.  
 2015 Proposed Savings of 2,885 MW; equivalent of almost 5 new power plants.

## Sub-Goal 2: Reduce Per Capita Electricity Consumed 5% by 2011 and 15% by 2015

The second goal in the EmPOWER Maryland Bill is a per capita reduction in energy of 5% by 2011 and 15% by 2015. To ensure a stable funding mechanism, Maryland's utilities are required to achieve a minimum of 10% of the goal through cost-effective programs approved by the PSC. MEA's programs are designed to supplement these efforts and to assure that no Marylander is left behind.

## **Background: Market Transformation for Electricity Reduction**

Maryland is embarking on a process to help consumers and businesses understand and adopt energy saving strategies by removing key market barriers. The key market barriers include a lack of low cost and long term financing, a lack of clear information about energy savings for consumers and businesses, and a lack of skilled energy-oriented technicians.

MEA and the Maryland utilities implementing EmPOWER Maryland energy reduction goal addresses these key market barriers through the following actions:

- MEA and Utilities have developed consumer and business information and education programs that will help highlight the clear economic and environmental benefits of saving energy by investing in energy efficiency products and services.
- MEA and the utilities are providing incentive for consumers and business that buy ENERGY STAR or energy efficient appliances, products or heating and cooling equipment
- MEA, other state agencies and the utilities are investing in training a green workforce to be able to install needed energy saving products and equipment in homes and businesses.
- MEA is working on a number of fronts to develop innovative financing options for consumers that allow consumer to pay for energy efficiency investments over a longer period of time (10 plus years)
- MEA is offering businesses low interest loans to speed the inclusion of energy saving devices in high energy use commercial operations

The ultimate objective is to change the behavior of the millions of families and businesses in Maryland so that energy conservation and efficiency is self sustaining. These behavioral changes will in turn create a market transformation that Maryland can continue to support. The market transformation strategy for influencing the State's electric consumption is further broken down into two target consumer markets: **residential** (consisting of both low to moderate income, as well as standard residences) and **industrial/commercial (I/C)** (including government and agricultural facilities).

MEA market transformation strategy for both the residential and the industrial/commercial markets is to; 1) Expand Energy Efficiency, 2) Promote Renewables, 3) Finance Clean Energy Innovations, and 4) Provide Consumer Energy Information. The four are part of a complete market transformation strategy that is applied to all of MEA's programs and initiatives.

The four market transformation strategies complement each other and the specific MEA programs and initiatives. The residential and I/C programs are designed to utilize the strength of the four strategies to ensure the maximum clean energy results which means achieving EmPOWER Maryland.

The challenge is to implement a strategy and plan that will reduce energy consumption and demand for both residential and I/C consumers. The ratio of electric energy consumption between the two market sectors, residential and I/C, is about a 60-40 split. Different approaches and strategies are required in order to reduce electric energy consumption in these two markets.

## **Strategy: Market Transformation for Electricity Reduction**

The EmPOWER Maryland goal to reduce per capita electricity consumption by 15% by 2015 requires Maryland consumers and businesses to change their energy use behavior so less energy is used. A fully transformed energy market is one where all available energy efficiency measures have been adopted by consumers and businesses.

## **1. Residential Consumer Market - Energy Efficiency and Demand Reduction Electricity Programs**

MEA and the utility companies are offering energy efficiency reduction programs for the residential, commercial and industrial market places to help reduce Maryland's electricity consumption while helping families and businesses lower their energy bills.

The challenge is to implement a strategy and plan that will reduce energy consumption and demand for both residential and I/C consumers. Peak demand and consumption for the two market sectors is occurring during the same time period. Different approaches and strategies are required in order to reduce electric energy consumption in these two markets.

The key strategy is to reduce the peak usage and consumption of electricity. If you look at an electric load curve, the peak time for electric energy consumption and demand is Monday through Friday from about 8am to 8pm. During that time period, you have a large percentage of the population in office buildings, schools, facilities, and factories. At the same time, you still have a large percentage of the population still active in the residential homes. Both the buildings and homes use a large amount of electricity to provide heating/ventilation/cooling (HVAC), lighting, and other electrical equipment (computers, printers, microwaves, coffee pots, etc). Residential homes have similar requirements, just usually at a smaller scale.

MEA and the utility companies are offering energy efficiency reduction programs for residential consumer market to reduce Maryland's per capita electricity consumption.

### **EmPOWER Residential Programs**

#### **A. Energy Efficient Appliance Rebates**

MEA plans is working with Maryland's utilities to enhance their existing appliance rebate programs and put more rebates in the hands of Maryland consumers. This program will provide additional rebates for super-efficient clothes washers and refrigerators, adding onto the amount offered as part of the utility programs. It will also add a new product rebate for ENERGY STAR electric heat pump water heaters. Many utilities and retail appliance outlets will offer appliance recycling which will help in the reduction of greenhouse gases.

#### **Beneficiaries**

This program will be available to all Maryland homeowners, including those serviced by small municipal and cooperative utilities. MEA will run a simplified appliance rebate program for these consumers, who currently have no such program available to them. Municipalities and co-ops will assist in marketing and outreach.

#### **B. Single Family Homes Efficiency Improvements**

MEA is collaborating with Maryland's five utilities to establish Home Performance with ENERGY STAR programs. The programs center on the utilities offering coordinated incentives for their customers. The incentives vary by utility, and include subsidized home energy audits and equipment rebates in addition to a greater level of comfort and efficiency in the home. Note that MEA is also working with Maryland's community colleges to establish the infrastructure for this program by creating a comprehensive, "one-stop" contractor training program. Contractor training includes BPI (Building Performance Institute) Building Analyst, BPI Envelope, LEED awareness, and HVAC specialist. Contractors must be appropriately certified in order to participate in utility programs, giving consumers a high level of confidence in the quality of work.

#### **Beneficiaries**

This program is available to Maryland homeowners living in single family homes or townhomes, who are customers of one of the five investor-owned utilities. The contractor training is open to the public.

#### **C. Multi-Family Housing Retrofits for Low and Moderate Income Families**

A significant portion of low and moderate income families are renters, yet apartments and condominiums have not been included in the traditional weatherization programs. In coordination with the Department of Housing and Community Development (DHCD) and housing nonprofit organizations, MEA will conduct energy efficiency retrofits in apartment units to reduce energy bills for low and moderate income families.

#### **Beneficiaries**

Residential customers in multi-family buildings who are responsible for their utility bill, particularly low and moderate income Maryland residents

#### **The Way it Works**

The program focuses primarily on apartment buildings undergoing significant rehabilitation efforts as well as properties needing energy efficiency upgrades. Some new construction projects may also be served. Recruitment of potential buildings will be conducted through DCHD and other existing state and local affordable housing agencies, utilities and building management associations. MEA will leverage funds with DHCD to pay a portion of incremental cost for energy efficiency measures for new or rehabilitated multifamily buildings already undergoing DHCD rehabilitation.

#### **D. EmPOWERing Financing (EF) Initiative**

The EmPOWERing Financing (EF) Initiative will leverage public funds with private capital to offer local governments a voluntary clean energy loan program secured through voluntary property-tax or utility assessments, for their citizens. The first investment of \$425,000 of ARRA funding will capitalize a “Phase I” program in Annapolis for approximately 50 efficiency retrofits during late winter and early spring.

#### **Beneficiaries**

Maryland families and small commercial businesses that invest in energy efficiency and renewable energy systems will have increased access to financing to help overcome high up-front investments in energy efficiency and renewable energy.

#### **The Way It Works**

Based on the Annapolis EZ and the Montgomery County Home Energy Loan Program (HELP), the EF initiative will offer localities a program whereby interested Marylanders could voluntarily obtain a clean energy loan secured through the locality (e.g., collected on water bills, property taxes, etc). MEA is partnering with the Maryland Clean Energy Center to create a “program in a box” that enables municipalities to offer energy efficiency and renewable energy financing quickly and effectively. This “program in a box” will include: model local ordinances, standard contracts, development for software to assist with the application process, and marketing concepts.

#### **E. EmPOWERing Clean Energy Communities**

MEA will work with Maryland counties and municipalities to provide funding for clean energy measures for government owned or operated facilities and non-profits providing assistance to low and moderate income residential customers. Through the Energy Efficiency and Conservation Block Grant program (EECBG), DOE is providing \$9.5 million to MEA to act as the coordination and distribution agent within Maryland for smaller communities that are not receiving direct funding through the U.S. DOE. The EmPOWERing Clean Energy Communities grants will be competitively awarded to energy efficiency projects that generate significant energy savings, with the financial benefits of the energy savings being passed on to Maryland’s low-to-moderate income residents.

#### **Beneficiaries**

The program is designed for Maryland’s counties and municipalities’ governmental facilities and non-profits supporting low and moderate income residential residents.

#### **The Way it Works**

Through the American Recovery and Reinvestment Act (ARRA), the State of Maryland will be receiving approximately \$52 million in funding for the U.S. Department of Energy (DOE) Energy Efficiency and Conservation Block Grant

(EECBG) program. The ten largest Maryland counties and the ten largest Maryland municipalities, based on population, are eligible to receive EECBG grants directly from DOE. MEA has approximately \$9.6 million in EECBG funds for projects to be implemented in the remaining 13 Maryland counties and 147 municipalities not eligible to receive EECBG grants directly from DOE. The MEA EmPOWERing Clean Energy Communities grant program provides competitive funds to non-profit organizations, community groups, and local governments that serve Maryland's low-to-moderate income households.

MEA will be allocating the majority of the EECBG funds in the form of sub-grants, using a population based formula. MEA will also be using a portion of the EECBG funds to provide energy engineering services to help the counties and municipalities receiving grants to identify potential energy efficiency and conservation projects and/or to conduct planning sessions for renewable energy projects. EECBG will provide assistance to help local governments assess their specific energy opportunities, prepare project bid specifications, and estimate project savings. In order to ensure an equitable distribution of the EmPOWER Clean Energy Communities grants statewide, each Maryland county (or county equivalent) has been assigned an allocation of grant funds based on the number of low-to-moderate income households residing in the respective county (or county equivalent).

#### **F. Clean Energy Job Training and Building Code Technical Assistance**

The Maryland Department of Housing and Community Development (DHCD) adopts, on a three-year cycle, the latest iteration of the International Energy Conservation Code (IECC) within 12 months of its promulgation, and local governments must implement and enforce the most current code within six months of adoption by DHCD.<sup>1</sup> The 2009 IECC for both residential and commercial buildings became effective in Maryland on October 1, 2009. The new code is expected to yield additional energy savings of approximately 15% compared to the 2006 IECC.<sup>2</sup>

The ARRA funding provides states with building code technical assistance to assist jurisdictions in becoming 90 percent energy code compliant. In addition, job training dollars are provided for by ARRA. MEA will develop programs to assist with code compliance and will partner with state agencies and academic institutions to provide job training in the clean energy field.

#### **Beneficiaries**

Maryland jurisdictions, businesses and job seekers

#### **The Way It Works**

- **Training:** Funds will be used to provide job training to assist the green businesses that are supporting the energy efficiency and renewable initiatives. MEA will work as appropriate, with DHCD, DLLR, GWIB, community colleges, universities and the Maryland Clean Energy Center to provide technical and business training.
- **Energy Codes:** In coordination with the Building Codes office of the Department of Housing and Community Development, MEA will develop a series of strategies to ensure 90 percent code compliance by county and city planning offices. This will be achieved through mentoring and training, and advanced training and technical assistance.

#### **Industrial/Commercial Market Energy Efficiency and Demand Reduction Programs**

MEA and the utility companies are offering energy efficiency reduction programs for Industrial/ Commercial (I/C) consumer market to reduce Maryland's per capita electricity consumption.

<sup>1</sup> Senate Bill 625 (2009), <http://mlis.state.md.us/2009rs/billfile/SB0625.htm>

<sup>2</sup> Buildings Codes Assistance Project, *Building Codes & Efficiency: Maryland factsheet*, February 2009, [http://bcap-energy.org/files/Maryland\\_Fact\\_Sheet.pdf](http://bcap-energy.org/files/Maryland_Fact_Sheet.pdf)

- **Prescriptive Incentives:** Utility programs provide significant financial incentives for a pre-determined or “prescriptive” list of energy efficiency measures including items such as lighting and lighting controls, motors, HVAC systems, variable frequency drives, commercial refrigeration equipment, and commercial kitchen equipment.
- **Technical Services:** Utility programs provide financial incentives to I/C customers to cover a portion of the cost of engineering services including feasibility studies, design, and commissioning of complex custom equipment installations.
- **Custom Incentives:** MEA and utility complementary programs provide financial incentives, loan opportunities and technical assessment services to I/C customers for custom energy efficiency measures that go beyond the prescriptive incentive offerings including: energy management systems, compressed air systems, process equipment and associated chillers, industrial systems, and whole building systems.

MEA and the utility companies are offering energy efficiency reduction programs for I/C market to reduce Maryland’s per capita electricity consumption.

#### **A. MEA EmPOWER Industrial/Commercial programs**

The industrial/commercial sector represents approximately 40% of electricity consumption in Maryland. MEA will reach out to this market sector by providing financial assistance to help Maryland businesses and institutions implement energy efficiency upgrades.

#### **Beneficiaries**

Large industrial, commercial and institutional consumers that undertake upgrades to improve energy efficiency.

#### **The Way It Works**

- **Loans:** Using the existing Jane Lawton Conservation loan program, MEA will offer a low interest rate revolving loan program to help finance the cost of energy efficiency projects. By operating this program as a revolving loan fund, MEA will ensure that financial assistance is available for industrial, commercial and institutional energy efficiency projects in future years as well.
- **Energy Assessments:** To complement the EmPOWER Maryland programs offered through electric utilities and cooperatives, MEA has designed the Industrial and Commercial Energy Assessment Program to meet the needs of industrial and commercial customers not being served through existing EmPOWER Maryland programs. MEA will partner with the Maryland Technology Extension Service (MTES) to provide energy assessment services to these customers. The energy assessment services will include a site visit by MTES to evaluate energy use at the industrial or commercial facility, identify opportunities for energy efficiency improvements, and report the assessment findings and recommendations.

#### **B. Administer State Agency Loan Program**

SALP is a revolving loan program administered by MEA. To assist the state in leading by example, MEA plans to expand SALP, a program which provides zero interest loans to state agencies for energy efficiency improvements.

#### **Beneficiaries**

State agencies implementing projects to reduce energy consumption

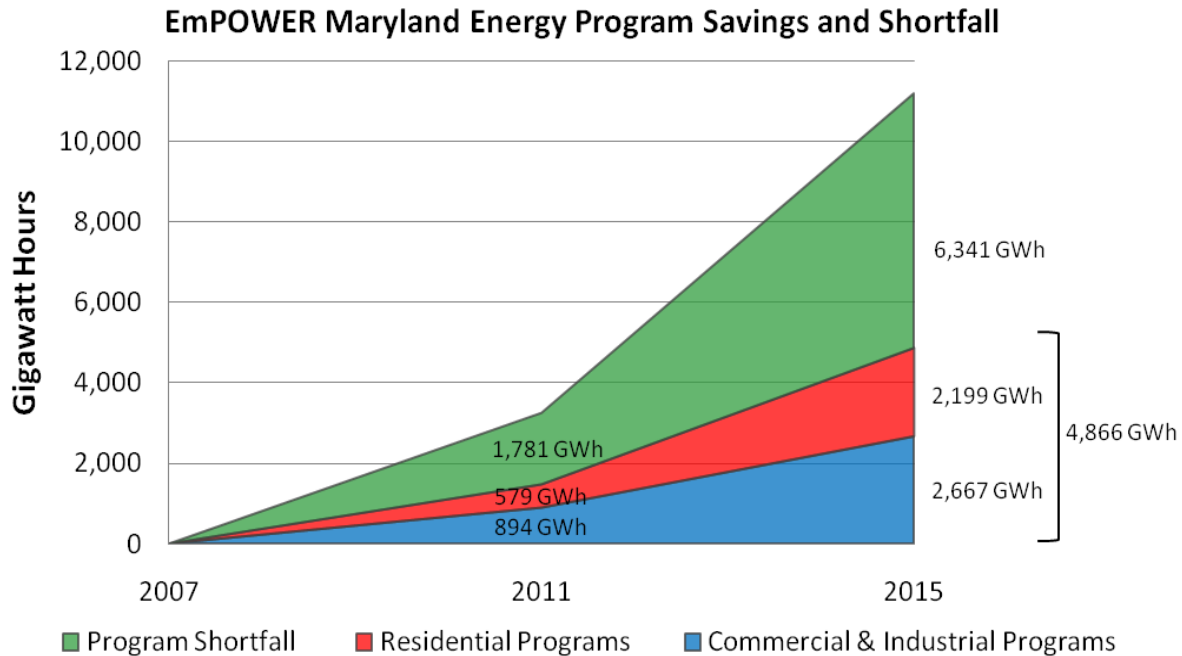
#### **The Way It Works**

MEA will continue to administer an expanded SALP program. The additional funding through ARRA will enable Maryland to initiate additional projects to further reduce state energy consumption during fiscal year 2010. State agencies pay zero percent interest on the loan and a one percent administration fee. The majority of funds will be linked with Energy Performance Contracts (EPCs) developed by state agencies in coordination with the Department of General

Services and MEA. Up to 20% of the funds will be available through a MEA solicitation process for smaller energy projects for which the EPC process is not appropriate.

### Measures: Electricity Consumption Initiatives

The EmPOWER Maryland Act of 2008 went into effect July 2008 and required the MEA, the PSC and utilities to develop an extensive portfolio of cost-effective energy reduction programs. In 2011, the Utilities' and MEA's current energy reduction target (based on the EmPOWER MD Act) will reduce 1,473 kWh and provide \$196 Million savings.



Note: Program savings calculations include combined Utilities and MEA programs

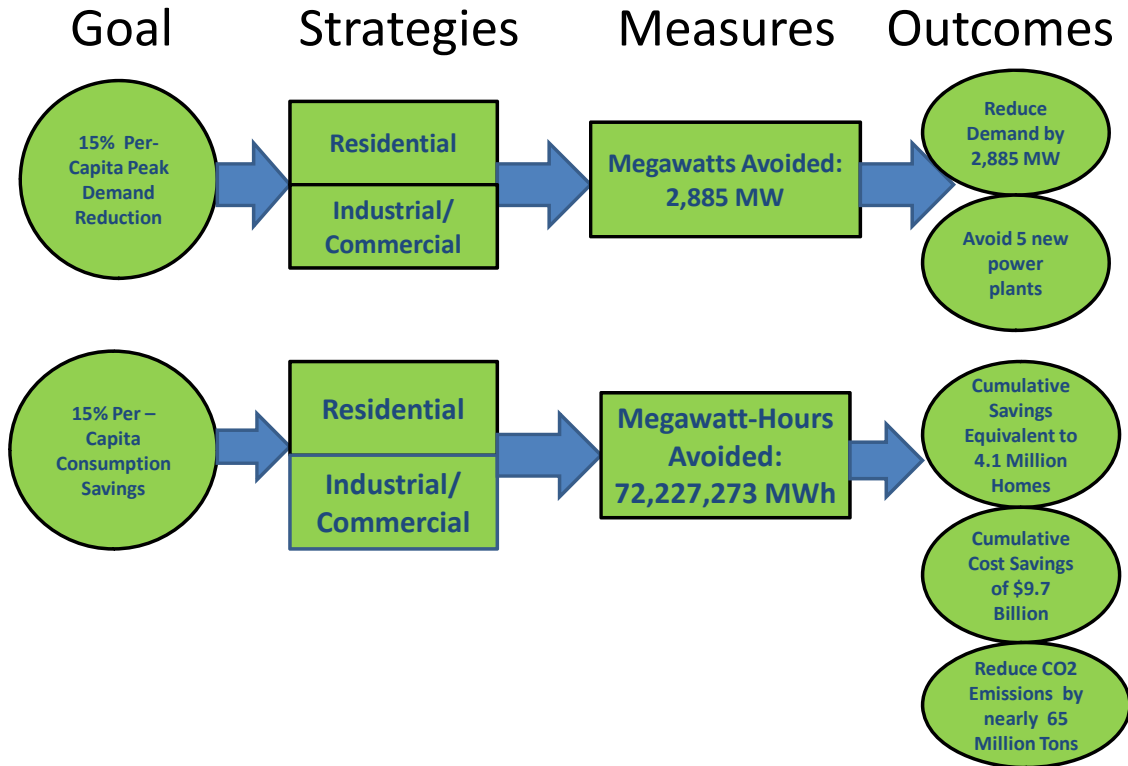
### Outcome: Reduce Per Capita Electricity Demand and Consumption

More is required to achieve the EmPOWER Maryland consumption goal. With the implementation of all existing programs, we estimate is that the State will be short by 10 to 48 percent. Utilities have indicated that as they begin implementation of programs and gain experience with various customer adoption rates, they will be able to develop deeper energy savings. Additional programs will be added over time to reduce a portion of the estimated 6,215 gigawatt hour shortfall. In order to address this possible shortfall, other program strategies include the adoption of new energy codes, federal climate change legislation, and energy programs such as smart grid technology which would assist Maryland in meeting the EmPOWER Maryland 15% goal. A Smart Grid is defined as using digital information and controls technology to improve the reliability, security, and efficiency of the electric grid. A Smart Grid allows deployment and integration of distributed and renewable resources, "smart" consumer devices, automated systems, and electricity storage and peak-shaving technologies.<sup>3</sup>

The diagram below outlines the key ideas surrounding our energy efficiency goals set forth through EmPOWER Maryland by Governor O'Malley.

<sup>3</sup> Source: [Energy Independence and Security Act of 2007 \(EISA 2007\)](#)

# GDU IX – Energy Efficiency



Both of the two components, regarding peak demand reduction and per capita energy consumption savings, necessitate the need for reaching both families and businesses through the above mentioned programs and resources. By working with households and the commercial/industrial sectors, Maryland will be able to avoid 2,885 megawatts of energy consumed through peak demand, while also negating the need for an estimated 72,227,273 mega watt hours through the per capita consumption savings. Ultimately, the combined benefits will alleviate the need for five new power plants, \$9.7 billion of cost savings, and a reduction in CO2 emissions by nearly 65 million tons, among other benefits for our families and workers.