Constellation Energy

ENVIRONMENTAL

UPDATE

October 29, 2008

John Quinn

Director - Environmental Issues

Maryland Issues

- 2008 Maryland General Assembly
- Climate Outlook
  - Climate Commission
  - RGGI
  - Future
- Regulations
  - Clean Air Interstate Rule
  - Distributed Generation
  - Stormwater Management
  - Coal Combustion By-Products

2008 Maryland Legislation

- HB 1056 (by Delegate George, et al)

  Environment - Water Management Administration - Wetlands and Waterways Program Fees
- HB 1253 (by The Speaker (By Request - Administration))

  Chesapeake and Atlantic Coastal Bays Critical Area Protection Program - Administrative and Enforcement Provisions
- SB 431 (by Senator Pinsky, et al)

  Natural Resources - Forest Conservation Act - No Net Loss of Forest
- HB 1193 (by Delegates McIntosh and Hucker)

  Environment - Statute of Limitations
- SB 442 (by Senators Frosh, Conway, and Pinsky)

  Environment - Clean Air Permit Fees
- *HB 0369 (by The Speaker (By Request - Administration))*

  Chesapeake Bay 2010 Trust Fund and Nonpoint Source Fund

2008 Maryland Legislation - Continued

- *HB 0977 (by Chair, Environment Matters Committee (MDE))*

  Controlled Hazardous Substances - Discharge or Release – Reporting Requirements
- HB 0374 (by The Speaker (By Request - Administration))

  EmPOWER Maryland Energy Efficiency Act of 2008
- HB 0375 (by The Speaker (By Request - Administration))

  Renewable Portfolio Standard Percentage Requirements – Acceleration
- HB 368 (by The Speaker (By Request - Administration))

  Regional Greenhouse Gas Initiative - Maryland Strategic Energy Investment
- HB 712 (by Delegates Barve, et al.)

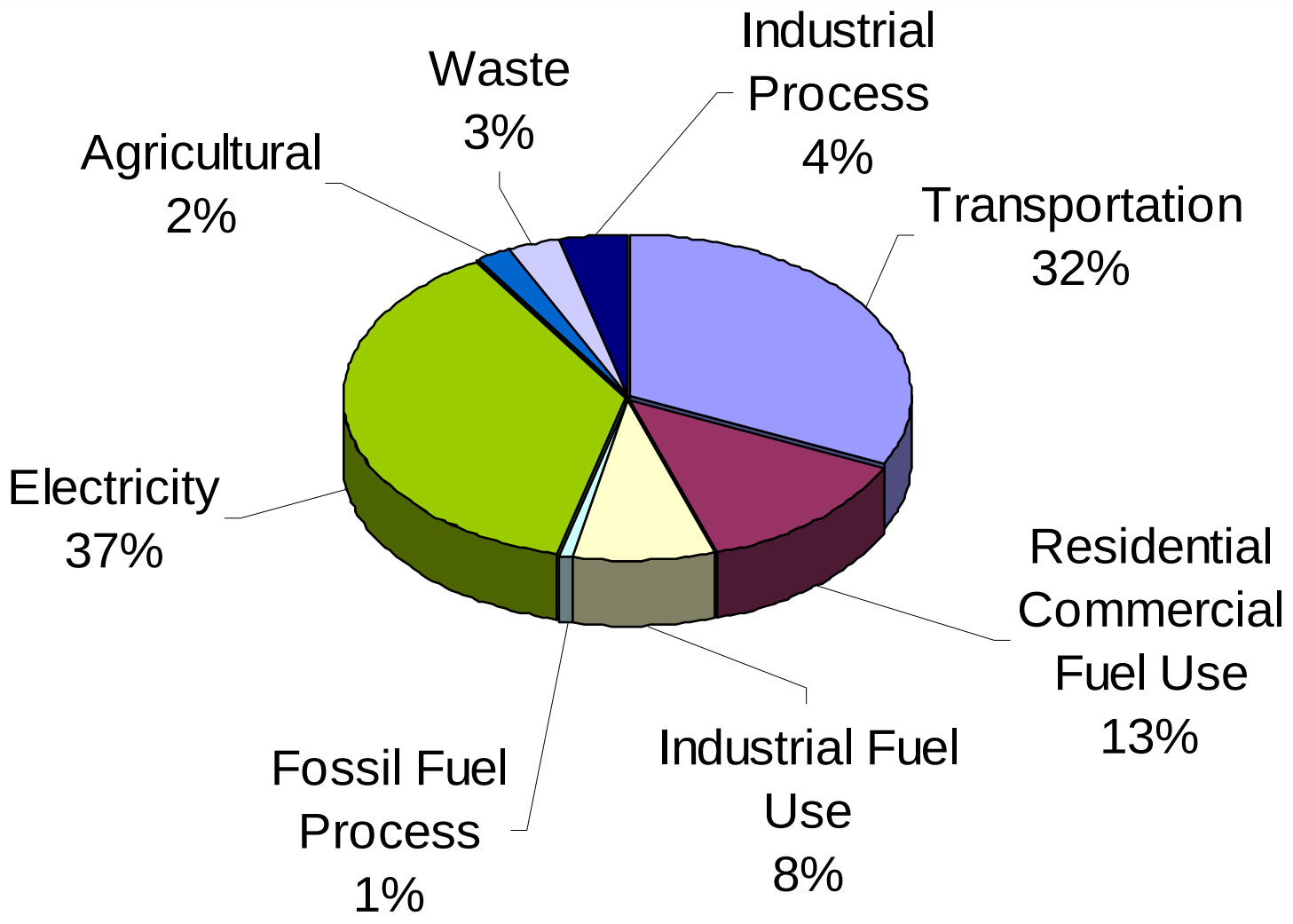
  Global Warming Solutions - Reductions in Greenhouse Gases

2009 Legislation

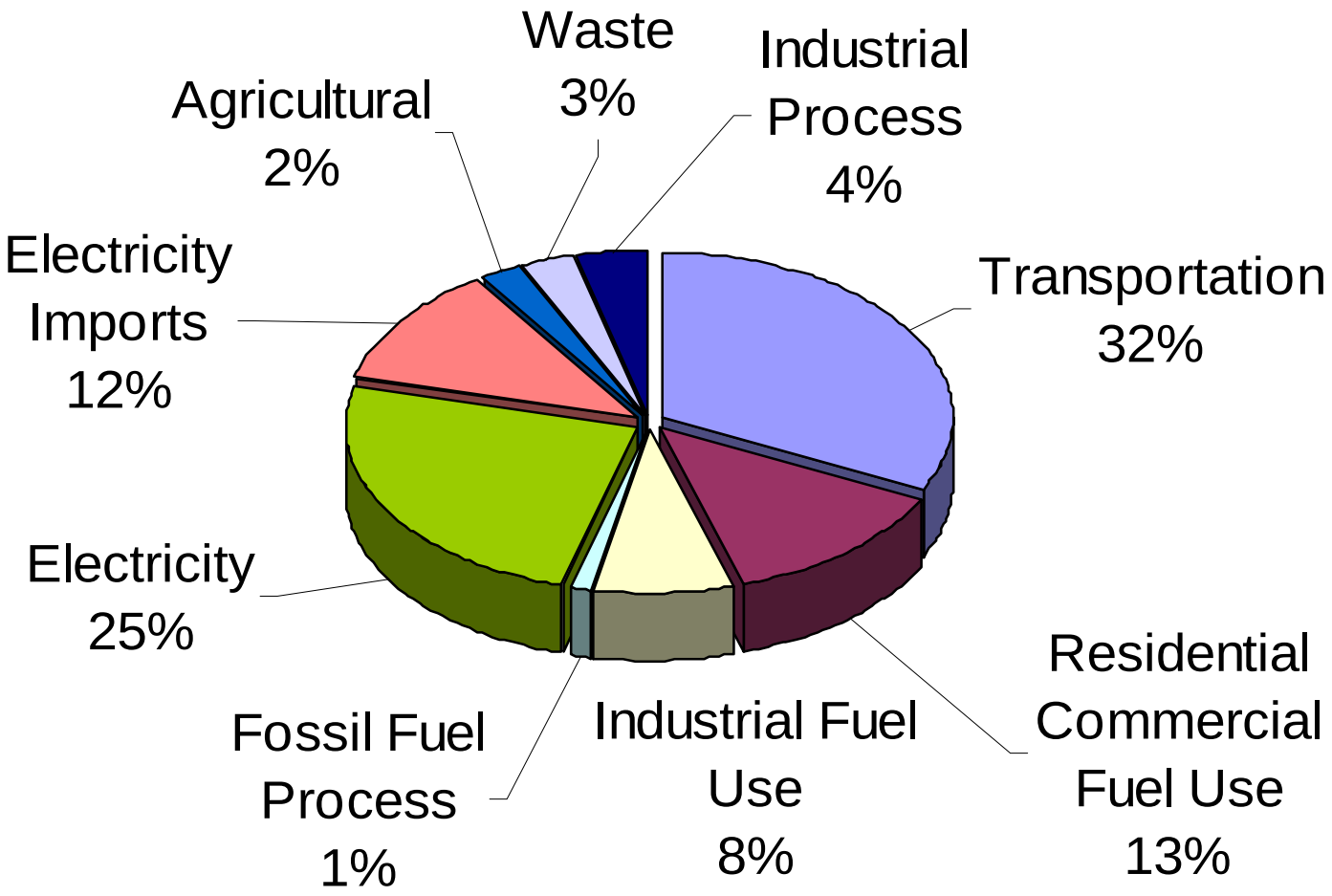
Maryland Climate Commission – August 2008

- Goals
  - 10 per cent reduction by 2012
  - 15 per cent reduction by 2015
  - 25 per cent to 50 per cent reduction by 2020
  - 90 per cent reduction by 2050

Maryland Emission Sources as Defined by MDE



Maryland Emission Sources - Electricity Imports Delineated



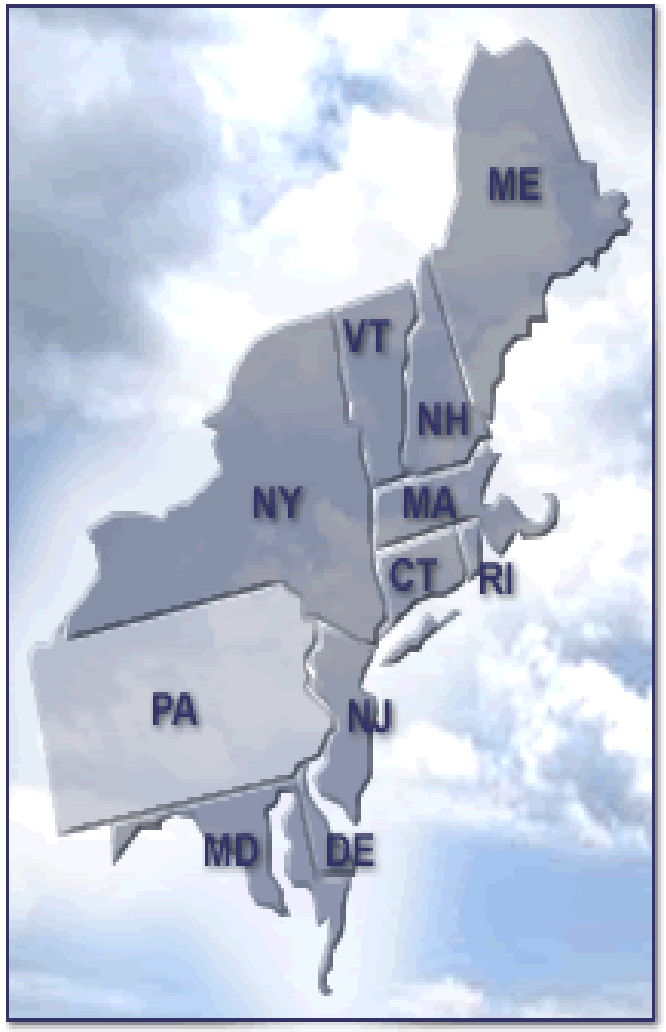
High Impact and Easy to Implement

- GHG Cap-and-Trade MDE
- Transportation Technologies MDOT (MDE)
- Energy Efficiency Resource Standard MEA
- State & Local Government Lead by Example MDE (MEA, MDOT)
- Improved Design, Construction, Appliances & Lighting in Government MDE (MEA, MDOT)
- Waste Management / Advanced Recycling MDE
- Renewable Portfolio Standard PSC (MEA)
- Demand Side Management & Energy Efficiency MEA (PSC)
- Improved Building & Trade Codes DHCD (MEA)

Next Steps – Maryland Climate Commission

- **Annual update** toward goals every November
- Create an **Office of Climate Change** within the Governor's office
- **Registry** Development
- Develop **incentives for early actions**
- Prepare and update a statewide **GHG inventory and forecast**
- Establish **government lead-by-example** policies and procedures to:
  - (1) demonstrate and implement best GHG reduction practices through the allocation of State fiscal resources and in operations, procurement, programs, high performance buildings, and management of state lands;
  - (2) implement sound sea level rise adaptation and response measures on State lands and through the allocation of State fiscal resources.
- Require State agencies to perform a **Climate Impact Assessment** prior to undertaking **new capital projects**.
- Track Maryland's performance measures reducing its vulnerability to climate change and sea level rise (**Adaptation-Stat**).
- Create a statewide **Education/Outreach** program.

Regional Greenhouse Gas Initiative (RGGI)



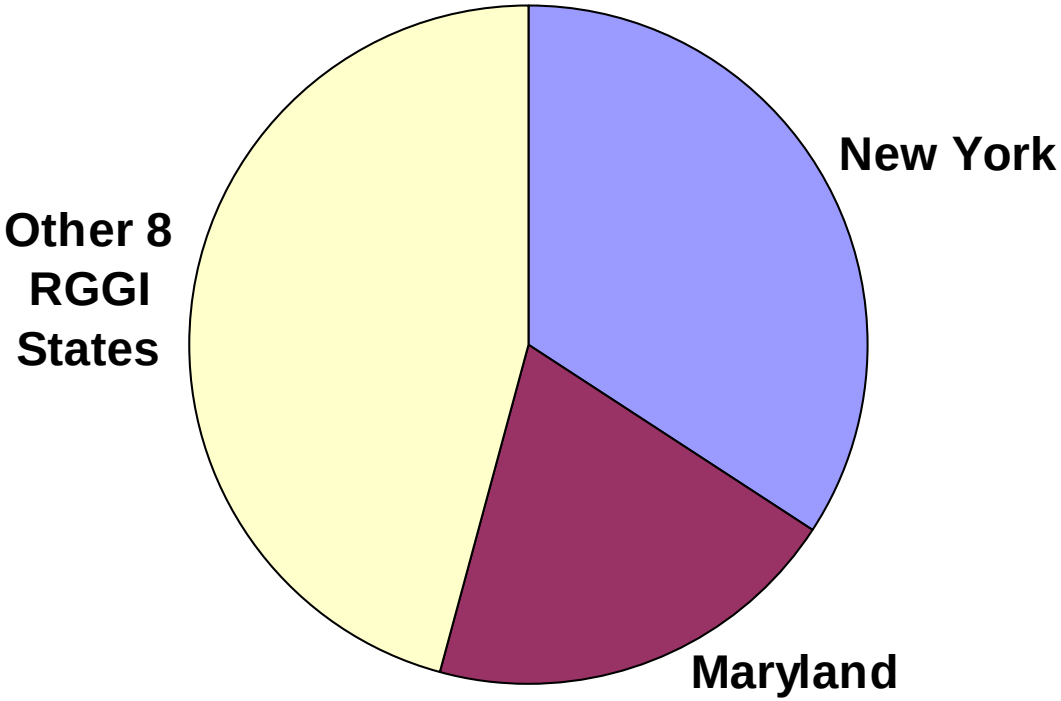
- Cap and Trade for Power Plants > 25 MW
- 2009-2014 Stabilize emissions
- 2015-2018 Phase-in 10% reduction
- Offsets (e.g. tree plantings) can be used for up to 3% of obligation
- Many or all 10 states moving to auction 100% to produce “consumer benefit – energy efficiency funding”

September 25, 2008

Auction Proceeds	%	Allocated to
$2,782,656.50	17	Department of Human Resources to be used for the Electric Universal Service Program and other electricity assistance programs in the Department of Human Resources
$3,764,770.56	23	Provide rate relief by offsetting electricity rates of residential customers
$7,529,541.13	46	Energy efficiency and conservation programs, projects, or activities and demand response programs
$1,718,699.61	10.5	Renewable and clean energy programs and initiatives; energy related public education and outreach; and climate change programs
$572,899.87	3.5	Costs related to the administration of the Fund (but limited to not more than $4,000,000)
$16,368,567.67	100.0	**Maryland Total**
$38,575,738.09	Total in Auction 1 All 6 States	12,565,387 CO2 Allowances

RGGI Auction of 32 million allowances 12-11-08

….and calendar quarterly thereafter



188,000,000 tons

Proposals for Use of RGGI Auction Proceeds

Residential Energy Efficiency Programs

- Home Performance with Energy Star
- Rebate for Home Insulation

Low and Moderate Energy Efficiency Programs

- Assisted Home Performance with Energy Star
- Refrigerator, Freezer, Room Air Conditioner Recycling Program
- Energy Efficiency for Multifamily Buildings

Commercial and Industrial Programs

- Specialized Industrial Energy Assessments
- Green Collar Workforce Training

Proposals for Use of Auction Proceeds

Community Programs

- State Agency Loan Program
- Community Energy Efficiency and Renewable Energy Grants
- School Grants for Energy Efficiency and Conservation

Renewable Energy Programs

- Solar, Geothermal and Wind Grants
- Renewable Energy Credit Aggregation
- Renewable Energy Loans and Leases
- Alternative Fuel and Efficient Vehicle Infrastructure

Public Outreach Campaign

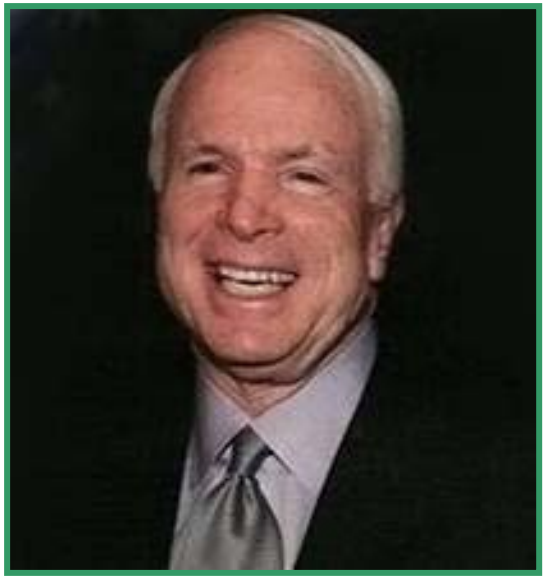
- Statewide Media Campaign
- EmPOWER Consumers

Regional Climate Initiatives

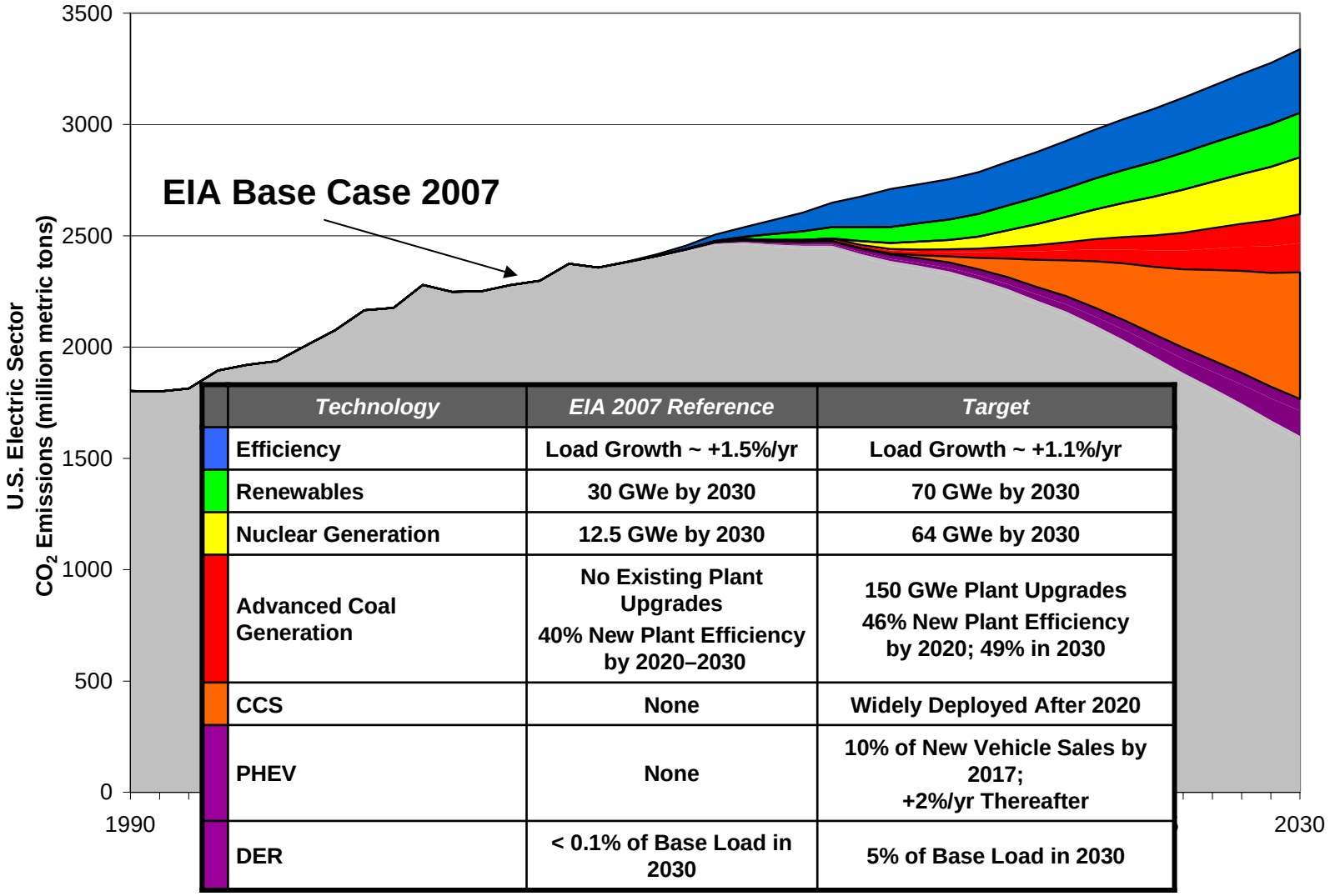
- ***Western Climate Initiative (WCI) - began in April 2007*:**
  - This initiative sets a regional goal of reducing emissions of the six major greenhouse gases (GHG) 15% below 2005 levels by 2020.
  - Partners are AZ, CA, MT, NM, OR, UT, and WA and the Canadian provinces of British Columbia, Manitoba, Ontario, and Quebec. Several others are observers.
  - Goal is to create a multi-sector cap and trade system to reduce GHGs in the region. No mandatory requirements yet, but in progress.
- ***Midwestern Regional Greenhouse Gas Reduction Accord*** *(11-15-07)*:
  - Under the Accord, members agree to establish regional greenhouse gas reduction targets, including a long-term target of 60 to 80 percent below current emissions levels, and develop a multi-sector cap-and-trade system to help meet the targets.
  - Signatories are MN, WI, IL, IA, MI, KS, and the Canadian Province of Manitoba. Several others are observers.
  - Goal is to establish regional greenhouse gas reduction targets and develop a multisector cap-and-trade system to help meet the targets. No mandatory requirements yet, but in progress.

Presidential Candidates Environmental Views

- A National Program is on the Way



CO_2 Reductions … Technical Potential

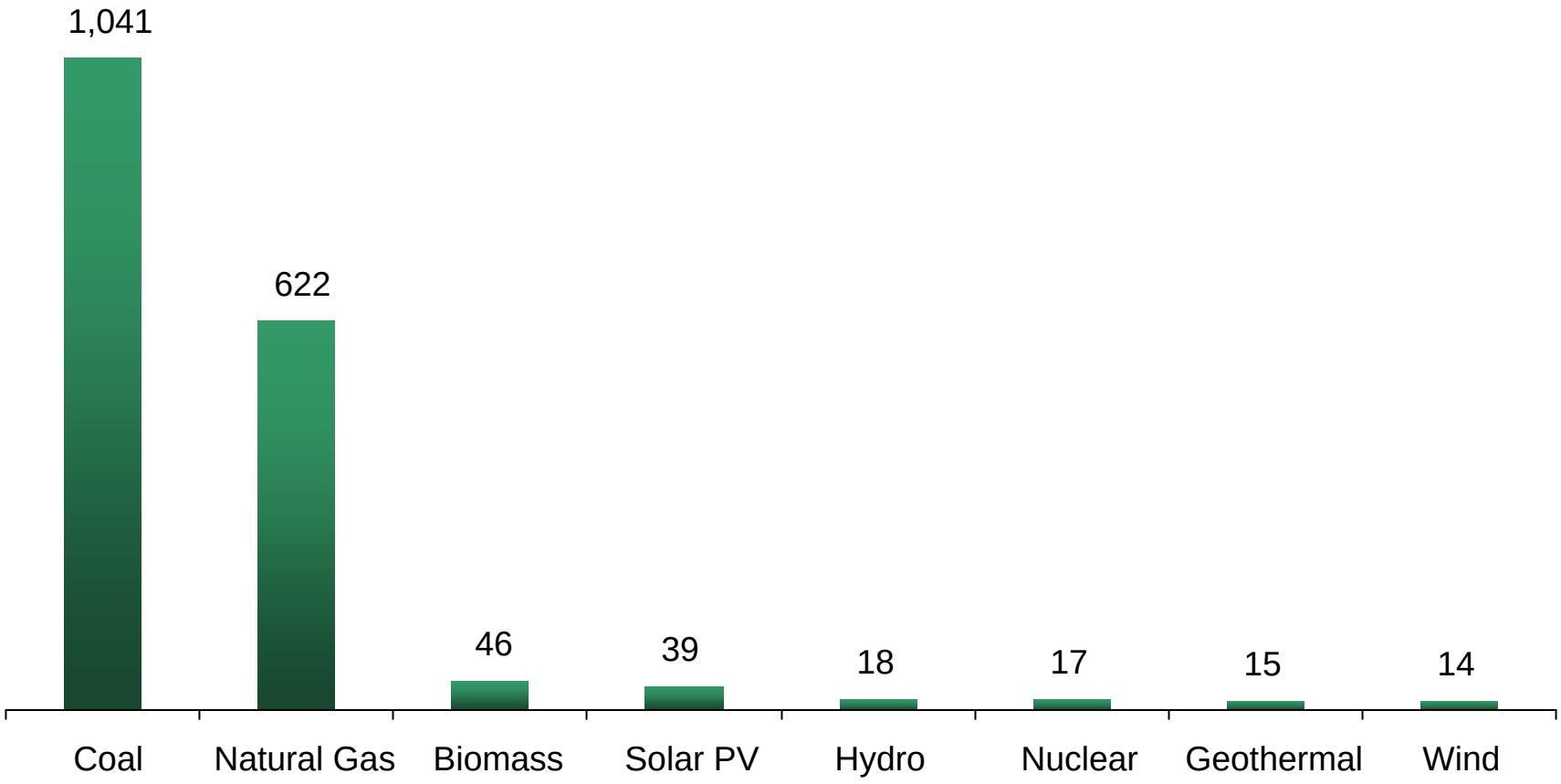


Technology	EIA 2007 Reference	Target
Efficiency	Load Growth ~ +1.5%/yr	Load Growth ~ +1.1%/yr
Renewables	30 GWe by 2030	70 GWe by 2030
Nuclear Generation	12.5 GWe by 2030	64 GWe by 2030
Advanced Coal Generation	No Existing Plant Upgrades 40% New Plant Efficiency by 2020–2030	150 GWe Plant Upgrades 46% New Plant Efficiency by 2020; 49% in 2030
CCS	None	Widely Deployed After 2020
PHEV	None	10% of New Vehicle Sales by 2017; +2%/yr Thereafter
DER	< 0.1% of Base Load in 2030	5% of Base Load in 2030

Source: EPRI

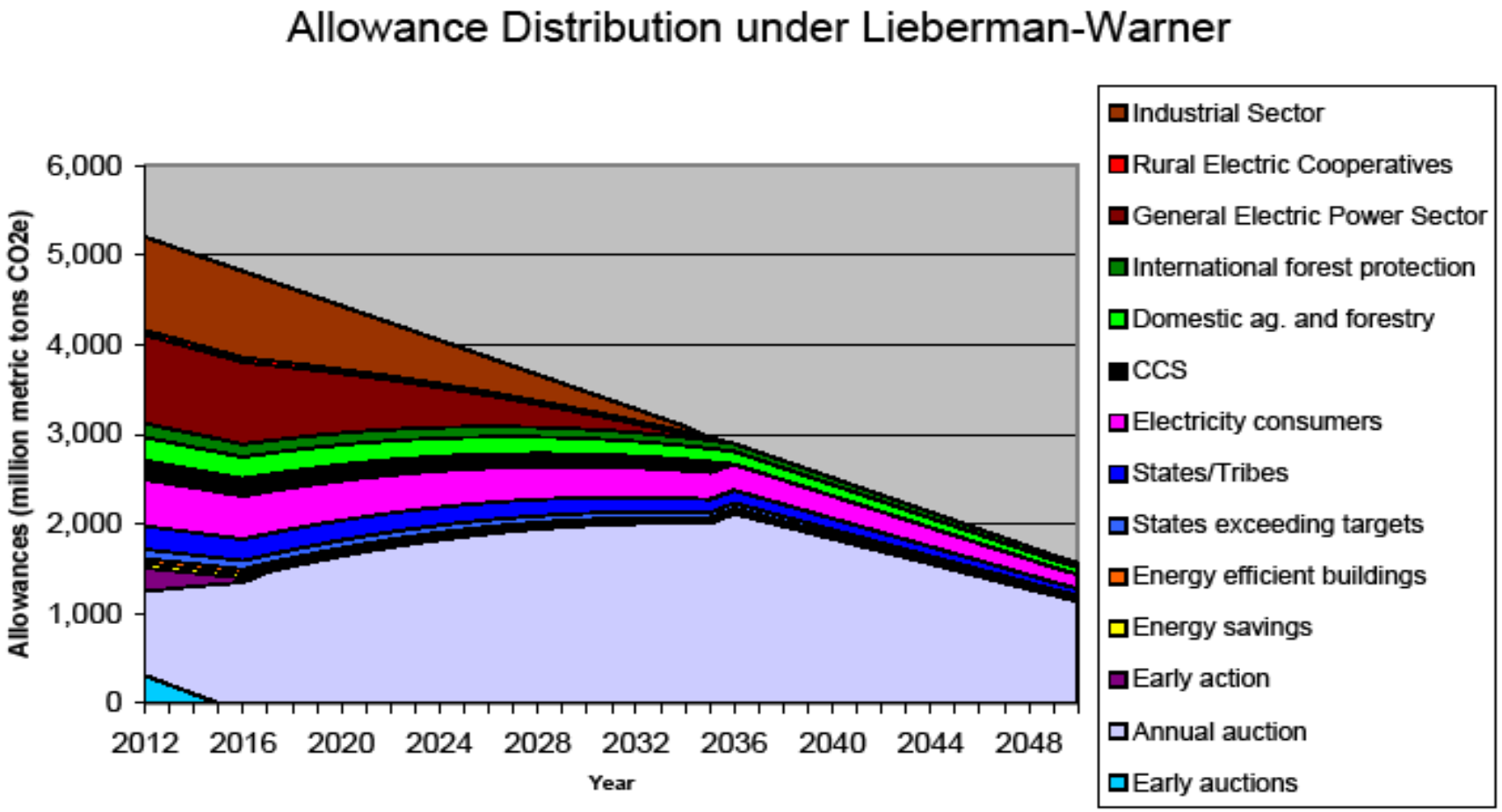
Comparison of Life-Cycle Emissions

Tons of Carbon Dioxide Equivalent per Gigawatt-Hour



Source: "Life-Cycle Assessment of Electricity Generation Systems and Applications for Climate Change Policy Analysis," Paul J. Meier, University of Wisconsin-Madison, August 2002.

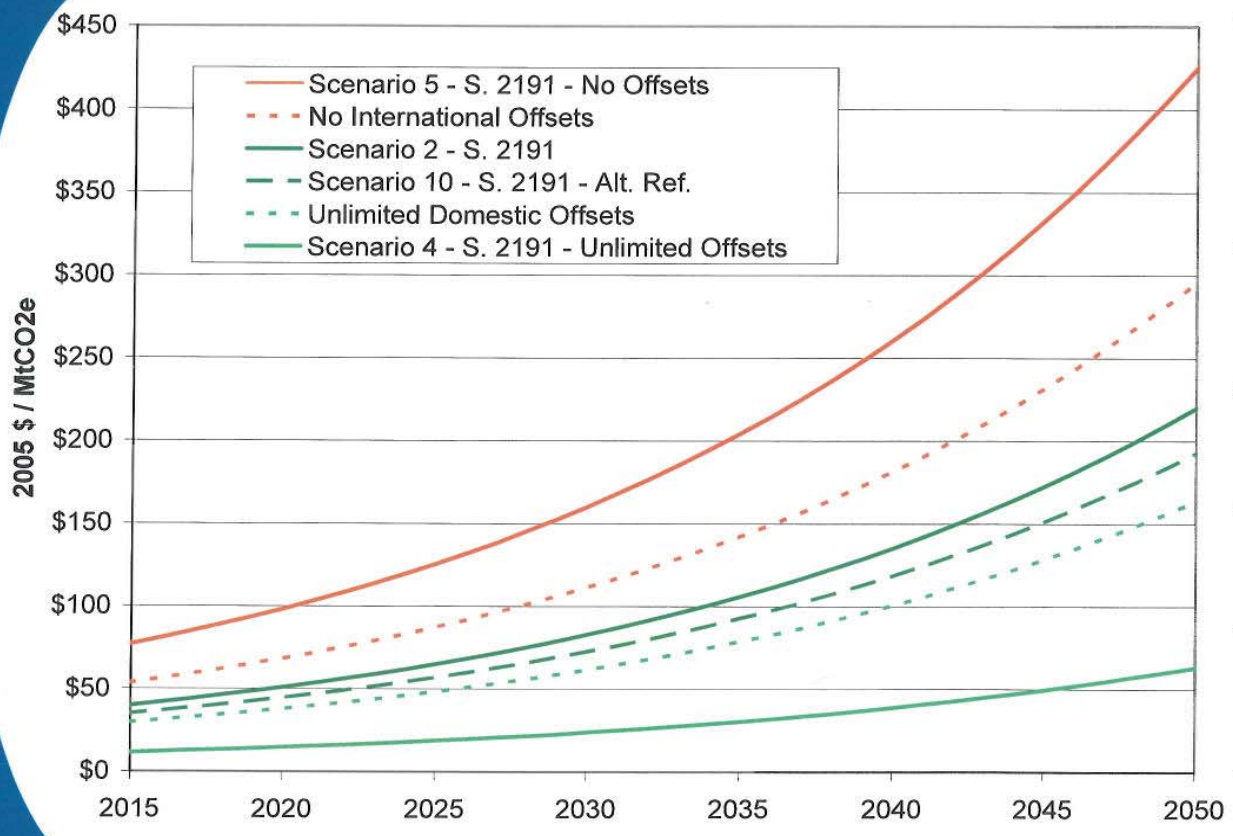
Lieberman-Warner allowance distribution changes over time



Source:WRI

Scenario Comparison

GHG Allowance Prices (IGEM)



- Compared to the variation in allowance prices between the various alternative technology scenarios, there is a greater variation in allowance prices amongst the alternative offset and international credit scenarios.
- Allowing the unlimited use of domestic offsets and international credits can reduce allowance prices by 71% compared to scenario 2.
- Allowing the unlimited use of just domestic offsets can reduce allowance prices by 26% compared to scenario 2.
- If international credits are not allowed, allowance prices increase by 34% compared to scenario 2.
- If both international credits and domestic offsets are not allowed, allowance prices increase by 93% compared to scenario 2.
- Allowance prices are 12% lower under the alternative reference case compared to scenario 2.

BGE's *Smart Energy Savers Program* SM

BGE Demand Response Infrastructure (DRI)

BGE offers participating customers their choice of either a free programmable thermostat or an air conditioner load control switch that will help reduce energy consumption and costs. These technologies allow BGE to cycle air conditioning/heat pump use during periods of very high electricity demand.

BGE Energy Efficiency Initiatives

BGE will provide incentives and rebates to customers who install Energy Star® high efficiency equipment and appliances such as heating and cooling systems, refrigerators and dishwashers. Also, BGE will facilitate home energy audits to identify savings opportunities.

Advanced Metering Infrastructure (AMI)

BGE will supply and install free of charge, new smart meters that provide automated and remote meter readings for all customers. As we deploy the infrastructure over time, the number of customer benefits will expand

Demand Response Overview

- Positioned to be the most aggressive residential program in the country – targeting 50% customer enrollment
  - Builds on BGE's successful DR programs today, with enhanced technology and benefits
  - Customers can choose to sign up for either a smart thermostat or A/C load control switch
  - Annual bill credits range from $50 to $100
- Targeting about 600 MW by 2011-12, triple the current level of DR capacity

- Demand response is the most cost-effective component of ensuring reliability over the next several years
  - Capital costs 3-4 times cheaper than new peaking generation
- BGE now bids demand response into the PJM capacity auctions (RPM)
  - PJM confirms that BGE has offered the largest single planned Demand Response project into an RPM auction to date

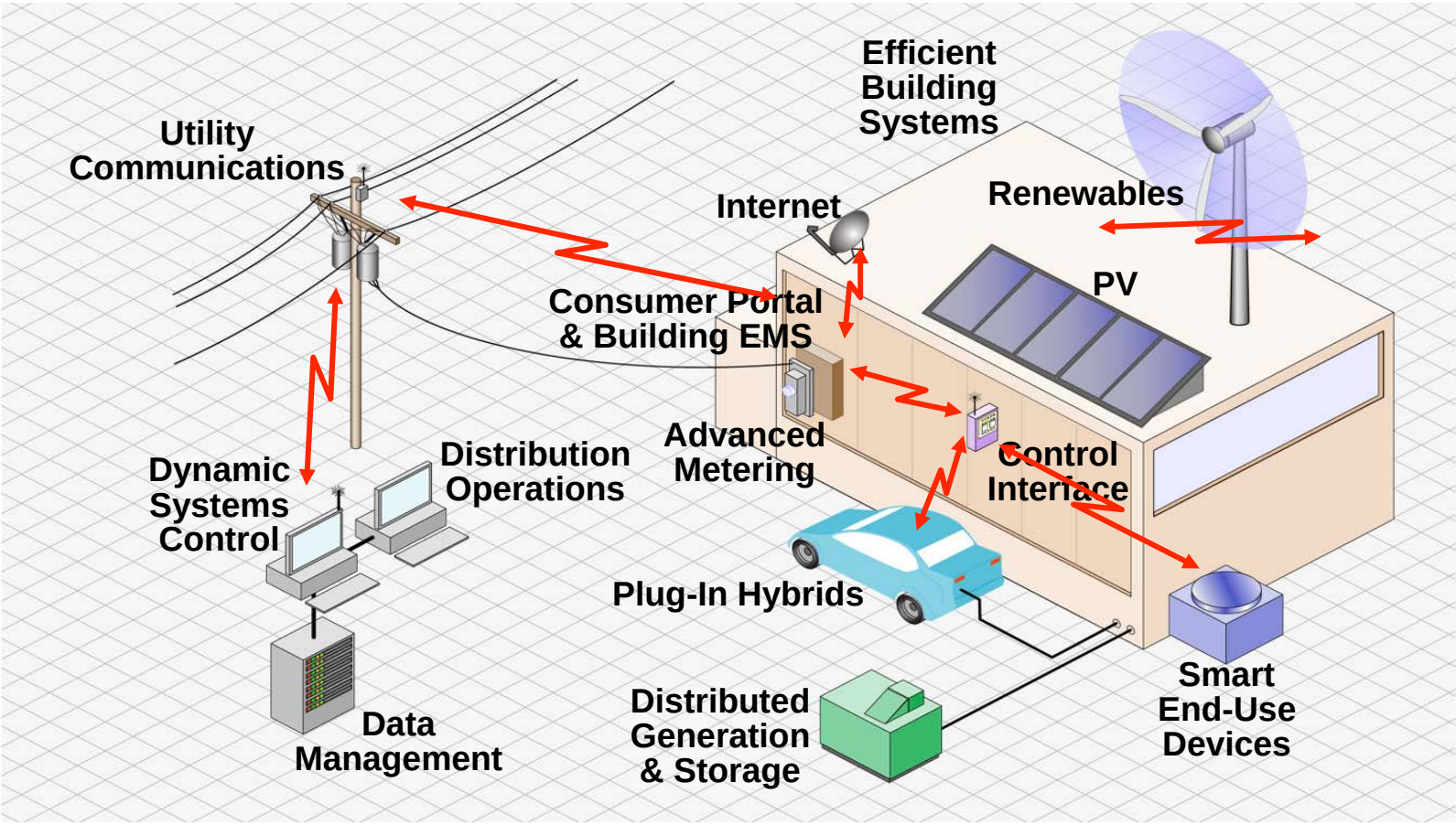
Advanced Metering (AMI) and Dynamic Pricing

- Benefits of Advanced Metering
  - Automatic and remote meter reads, no longer necessary to enter a customer's home
  - Eliminates estimated bills
  - Improved outage detection and response
  - Enhanced consumption information available to customers
  - Enables dynamic pricing and peak demand reductions
  - Lowers customer energy bills

Energy Efficiency & Conservation Programs

- Designed from current best practices of other states and previous Maryland experience, and collaborative input from other utilities and stakeholders
- Targeted to residential and small commercial customers
  - ENERGY STAR® rated lighting and appliances, heating and cooling, home retrofits, residential new construction, and limited income customers
  - Vendors to be selected from competitive RFP process
- Projected annual energy savings of 5% - 6% by 2015, and about 160MW of peak demand reduction
- Cost per avoided kwh is about 2–3 cents/kwh, vs supply cost of 11-12 cents/kwh
- Every dollar of investment projected to return about $2.00 to $2.50 in energy savings, plus environmental benefits
- Equivalent to removing 150,000 cars from Maryland roads

Smart Energy Efficiency Infrastructure



Distributed Generation

http://www.dsd.state.md.us/mdregister/3522/main_register.htm

- First ten hours of operation are exempt in new requirements
- Operational testing prohibited between 12:00 pm and 2:00 p.m. on high ozone days;
- Requires existing load shaving units to:
  - control NOx emissions,
  - install new engines that meet federal New Source Performance Standards, or
  - limit operation to a total of ten hours during any ozone season;
- Require new load shaving units to: meet New Source Performance Standards;
- Allow groups of small generators, such as poultry farms, to request alternative compliance methods; and
- Provide an alternative compliance option for load shaving units that involves the purchase of NOx allowances to be retired.

Stormwater Management

www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/swm2007.asp

- Measure the amount of impervious cover created by the development.
- Determine if the proposed land use or activity at the site is designated as a “stormwater hotspot.”
- Determine the Use Designation of the receiving water and the condition of the watershed.
- Provide a volume that mimics the natural rate of groundwater recharge using structural and/or nonstructural Best Management Practice (BMPs).
- Implement Environmental Site Design (ESD) to the Maximum extent practicable (MEP) to mimic predevelopment conditions.
- Follow a specific design process to implement a comprehensive site development plan.
- Provide water quality and recharge volume storage using approved Environmental Site Design (ESD) practices.

Stormwater Management

- Environmental Site Design (ESD)/Low Impact Development practices must be used wherever possible on new development sites.
- ESD design practices will be added to Maryland's Stormwater Design Manual.
- Local governments must adopt appropriate ordinances to ensure the new policies and practices in the Maryland Stormwater Design manual are implemented and enforced.
- A comprehensive stormwater management plan review and approval process must consider all aspects of project planning, design, and construction from initial conception through final approval.
- New standards for sites under redevelopment include reducing existing impervious area by at least 50 percent, implementing ESD to provide water quality treatment for at least 50 percent of the existing impervious area, or using a combination of both options to address at least 50 percent of the existing site's impervious area.

MDE's Proposed General Stormwater Permit

- The general permit covers construction activities that disturb one acre or more. Several key changes of note are:
- A 30-45 day waiting period following submission of the Notice of Intent (NOI) before permit coverage is approved to provide more opportunity for public participation;
- A requirement to monitor the construction site for a number of specific sediment discharge problems that, if observed, trigger review of site conditions on a first occasion and then review of plans to see if additional controls are needed if there is a second occasion;
- A requirement that plans submitted under the permit address eight critical points of interest related to site design and erosion and sediment controls; and
- Requirements regarding applicable Total Maximum Daily Loads and Water Quality Standards.

Maryland's Proposed Coal Combustion Byproduct (CCB) Regulations

- Disposal
  - Disposal facilities must meet the same standards required for industrial solid waste landfills, e.g. leachate collection, groundwater monitoring, the use of liners, deed amendments, and routine analysis of CCBs.
  - CCB disposal facilities must conform to local zoning and land-use requirements, and the County's 10 year solid waste management plan.
- Mine Reclamation Sites
  - For use of CCBs in noncoal mines, CCB sites must meet standards similar to those required for industrial solid waste landfills – liners, leachate collection, etc.
  - Standards for coal mine reclamation will ensure that only alkaline CCBs are used.
  - For both disposal and mine reclamation sites, dust control measures, post closure monitoring and maintenance, etc. must be performed.

- Generator Requirements
  - The proposed regulations also impose new reporting requirements on generators of CCBs.
  - This includes an annual report that covers how the material was recently used or disposed as well as plans for disposal or use for the next 5 years.
- Effects on Existing Sites
  - Existing CCB facilities that MDE has authorized prior to April 1, 2008 would be allowed to continue to operate under the current approval.
  - MDE may modify an existing authorization to require additional controls to protect public health or to prevent nuisances.
  - Any existing CCB facility that proposes to expand beyond its current authorization or operations would be required to notify MDE in writing.

Questions?