Interim Report of the Maryland Public Service Commission

PART I. Options for Reregulation

December 4, 2007

Interim Reports of the PSC

PART I. - **Options for Reregulation**

To be issued before end of January 2008:

PART II. - Analysis of Stranded Cost Settlements

PART III. - Wholesale Markets

PART IV. - SOS Procurement

PART V. - Constellation/BGE

Senate Bill 400

- The Public Service Commission shall, among other tasks:
  - ***conduct hearings*** and utilize any necessary ***outside experts***, to study and evaluate the status of electric restructuring in the State
  - consider changes that provide residential and small businesses a ***reliable electric system*** at the ***best possible price***, including options for reregulation
  - also consider the availability of ***adequate transmission and generation facilities*** to serve the electrical load demands of all customers in the State
  - consider the implications of requiring or allowing ***IOUs to construct, acquire, or lease generating plants*** and associated transmission lines;

Senate Bill 400 (cont'd)

- Due to scope of work to be conducted, the PSC was directed to file an **interim report** by December 1, 2007, that would, at a minimum, identify the issues relating to:

  - options for reregulation**,** and
  - discuss the costs and benefits to residential and small commercial customers of returning to a regulated electric supply market

Summary of PSC Actions: 2007 Interim

- Conducted 13 days of contested case proceedings
- Conducted 3 days of quasi-legislative proceedings
- Received testimony and comments from 59 witnesses and experts
- Received and reviewed more than 1,200 pages of written testimony and reports
- Retained the legal and economic consulting services of Kaye Scholer LLP ("Kaye Scholer") and Levitan Associates, Inc. ("Levitan") to prepare analyses of reregulation options, generation and transmission options, stranded costs and related issues.

Two Goals of Reregulation

- Maintain the **reliability** of the electric grid:
- Obtain the **best possible prices** for Maryland Ratepayers
- Threshold question: Will the “market” address the needs of Maryland’s ratepayers?

Caveats in Considering Reregulation

- Wholesale electricity markets are very complex. **Circumstances have changed even since 2006** when the General Assembly first requested these studies.

- Decisions regarding transmission siting and new generation have ripple effects in the economics of the system which may impact ratepayers in multiple ways – both good and bad.

- The market participants are sophisticated and data driven – investments in infrastructure can cost hundreds of millions and even billions of dollars.

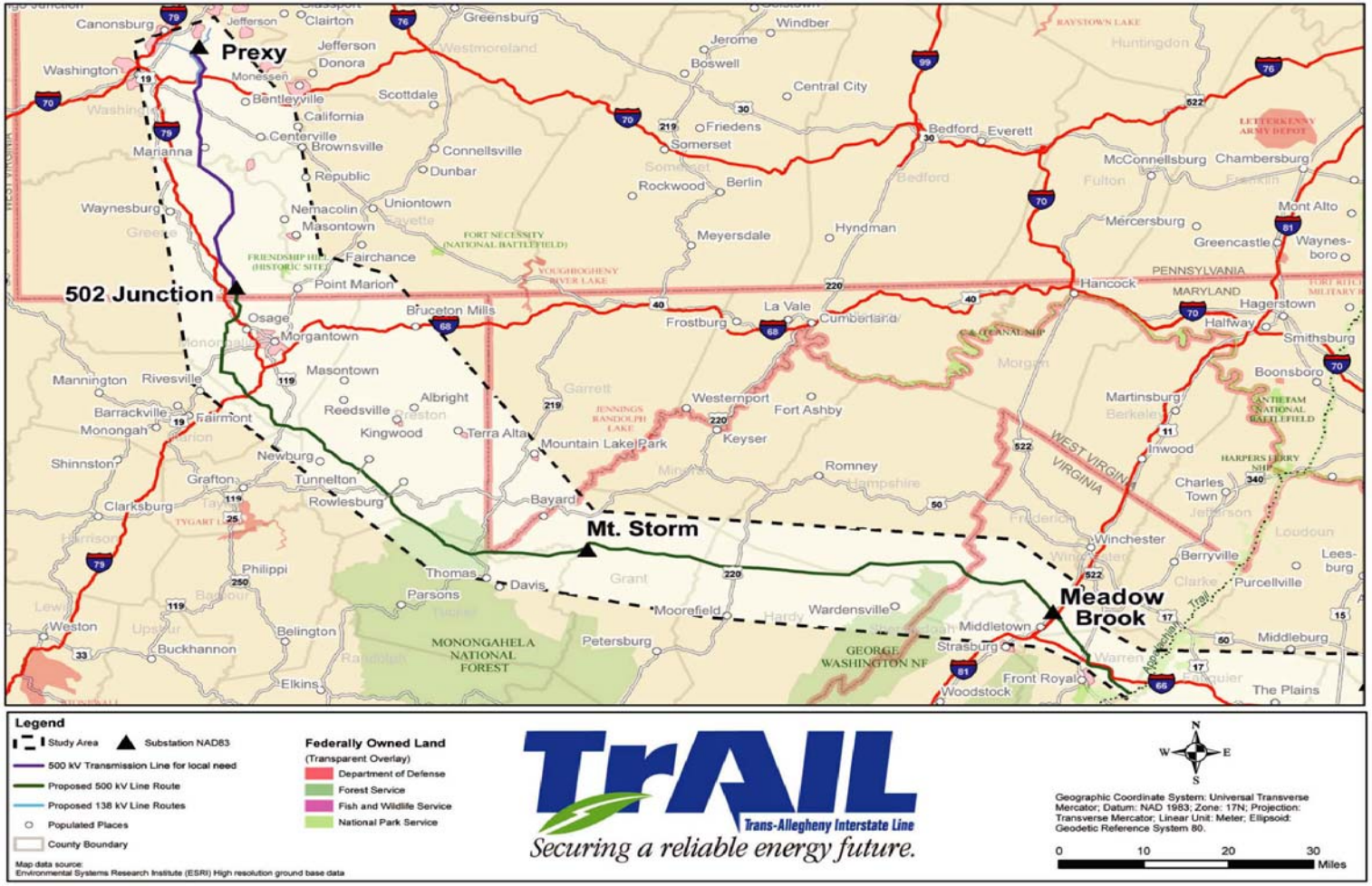
Are the Markets Working in Maryland? - Reliability

- Reliability:
  - As we discuss in these slides, Maryland faces a **serious reliability concern** in the 2011-2012 timeframe.
  - The lack of new generation in the state, coupled with inadequate transmission capability and growing demand means Maryland faces the prospect of brown-outs or even rolling black-outs on hot summer days in 2011-2012.

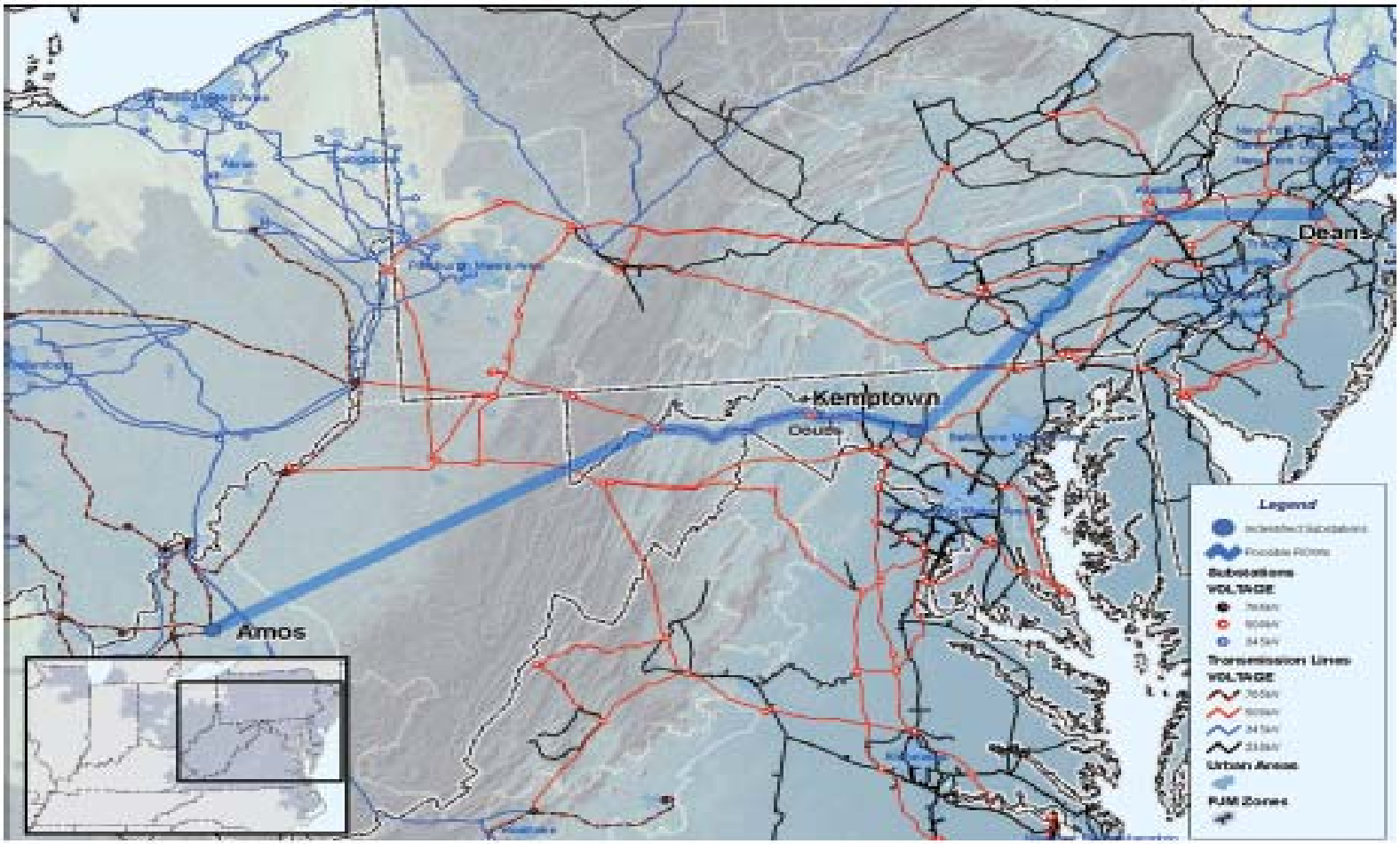
Are the Markets Working in Maryland? – Reliability (cont'd)

- **Two major transmission lines** have been approved by PJM to address Maryland's and the region's reliability shortfall.
- **The first line,** the Trans-Allegheny Interstate Line **("TrAIL")** is a 500-kV line through VA, WVA, and PA.
- **The 2nd line,** the **PATH** line, runs 300 miles from West Virginia through Washington and Frederick Counties to Kemptown Md. Substation.
- CPCN proceedings for the TrAIL line are pending before the utility commissions for each of these states.
- As expected, there is organized opposition to the lines.

Trans-Allegheny Interstate Line (TRAIL)



Potomac Appalachian Transmission Highline (PATH)



Maryland's Transmission Shortfall

- According to PJM if the TrAIL line is not service by 2012, the region's electricity load could exceed the transfer capability of the existing transmission system **by 2000 MW.**
- If the PATH line is not in service by 2012, the net load would exceed the import capability by 3,000 MW.
- **And if neither line is in place on time, the regional shortfall could be as much as 6500 MW**.
- Maryland's allocation of this shortfall is approximately 1500MW -equivalent to more than two 600MW power plants.

Maryland's Transmission Shortfall (cont'd)

- PJM has characterized the Mid -Atlantic shortfall as **"critical"** in testimony before the PSC.

- PEPCO & Delmarva Power and Light testified that the completion of both the TrAIL and PATH lines is:

  - "…**critical to maintaining the long term reliability and reducing persistent congestion in the Mid-Atlantic Region"**

- According to PJM, the "load shedding" i.e. voltage reductions and brown-outs that would result from this transmission shortfall would occur on "**any hot day**" in the area – not just 1 or 2 days a year.

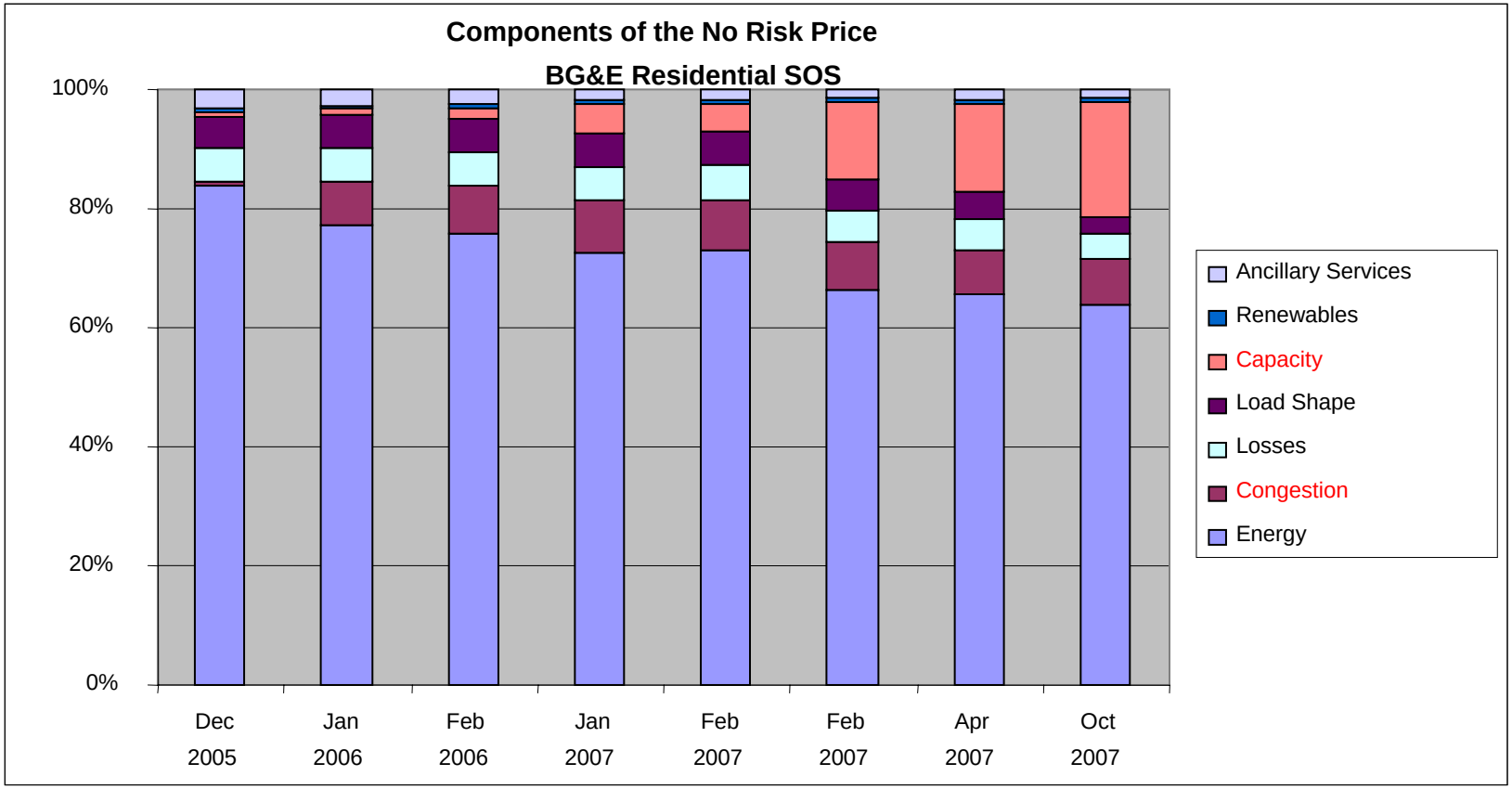
Maryland's Transmission Shortfall (cont'd)

- PSC staff: "…the **probability** that either or both of the TrAIL or PATH lines will be completed on schedule **is low**"
- It has been over a decade since a project of the size of these lines has been attempted – the last major line took over 15 years to complete.
- Maryland is part of the recently designated federal National Interest Electric Transmission Corridor, meaning the federal government could act to site and approve the lines in the absence of state action.
- However, states affected by the NIETC designation have expressed opposition to this designation.

Are the Markets Working in Maryland? - Price

- Market conditions have caused high prices in Maryland:
  - As we discuss in the following slides, being a net importer of energy, coupled with inadequate transmission, means Maryland pays high electricity prices.
  - Wholesale market rules adopted by FERC and PJM exacerbate Maryland's high prices.
  - On 2 key components of wholesale prices, capacity and locational marginal prices, BGE and PEPCO have the highest costs of any zone in PJM

Cost Components of Residential SOS Service



NOTE: Dates are SOS supply auction dates; Price allocations are based on auction results on the dates indicated for the future delivery of SOS supply. Ex: October 2007 auctions were for summer 2008 delivery.

Wholesale Markets = SOS Prices

- Two Components of Wholesale Market particularly influence SOS Prices:
  - Congestion
  - Capacity
- Re-Regulation efforts should focus on addressing these components

The First Cost-Driver: Congestion

- **Simply put,** congestion is the inability to import lower cost electricity because transmission lines are at their limit.
- **The longer explanation**: PJM, as the grid operator dispatches electricity in "merit – order" that is, from lowest cost generation to higher cost generation, to meet demand.
- When lines are "congested" or "constrained," they cannot carry enough low cost electricity to meet demand, and PJM must dispatch higher cost, local generation located in the constrained zone.
- In Maryland's case, that means there is a limit to how much lower cost electricity existing transmission lines can bring in from west to east.
- Higher cost generation is "dispatched" locally to meet demand.

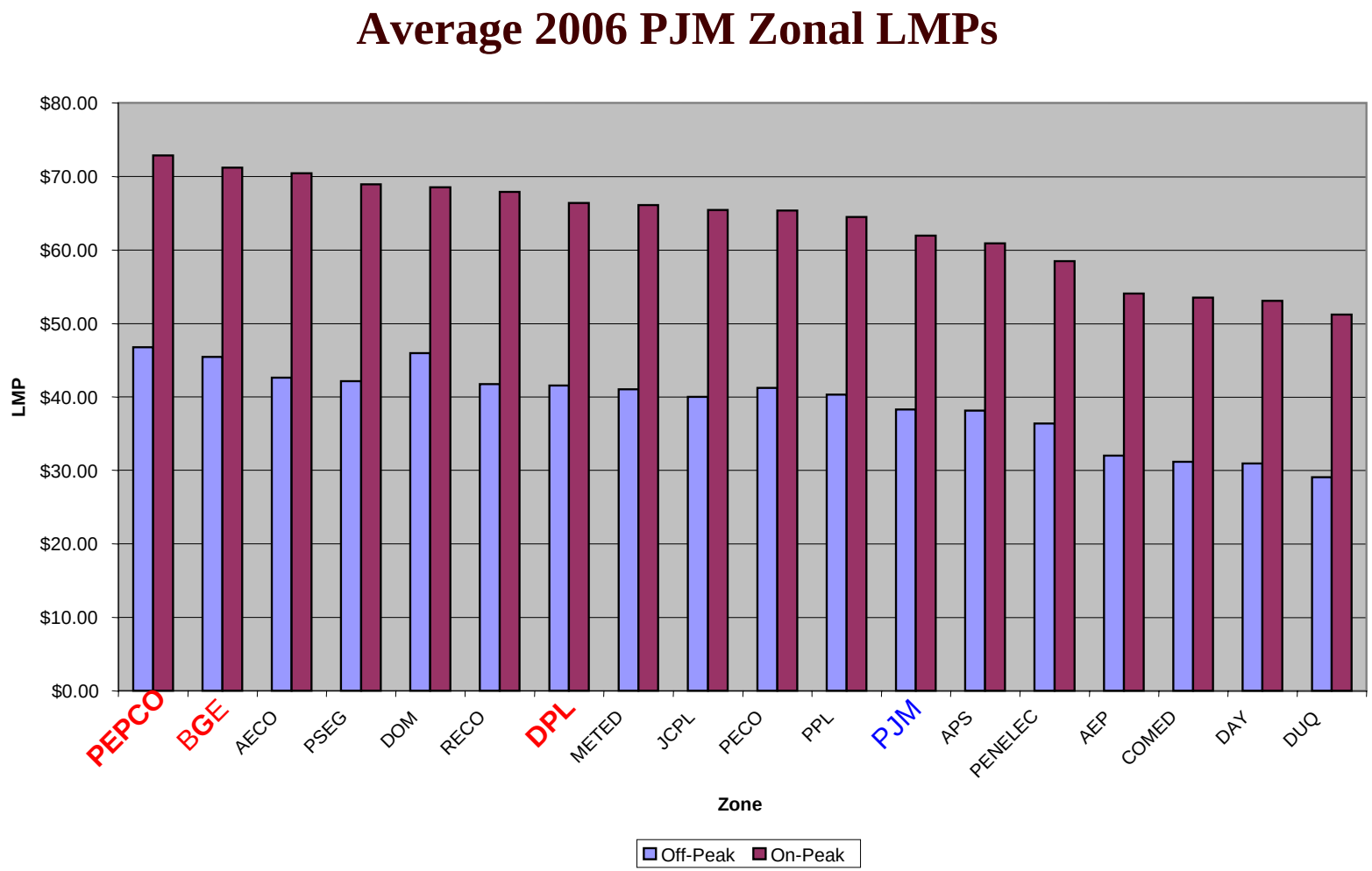
What is Congestion?

- Under PJM and FERC market rules, when these local, "marginal" generating units are dispatched, they set the price **for all units** operating in the zone, even lower cost units.

- A direct consequence is that when higher cost generation must be dispatched in a zone (i.e. BGE or PEPCO service areas) to meet the demand for electricity, overall electricity prices will be higher in that zone.

- Lack of adequate transmission, or local lower cost generation, creates high **"locational marginal prices" or LMPs.**

Impact of Congestion on Maryland Prices – by Utility



Transmission Congestion and Locational Marginal Pricing (cont'd)

- One PSC consultant estimates that for 2008, congestion will add over **$160M** in costs to residential SOS rates.

- The PJM market monitor estimates that gross congestion costs for all of Maryland (not netted with any offsets) in 2006 were **$1.2 Billion**. Actual costs could be as much as **$500M**

- The PSC is continuing to examine the costs with the assistance of Levitan and Associates

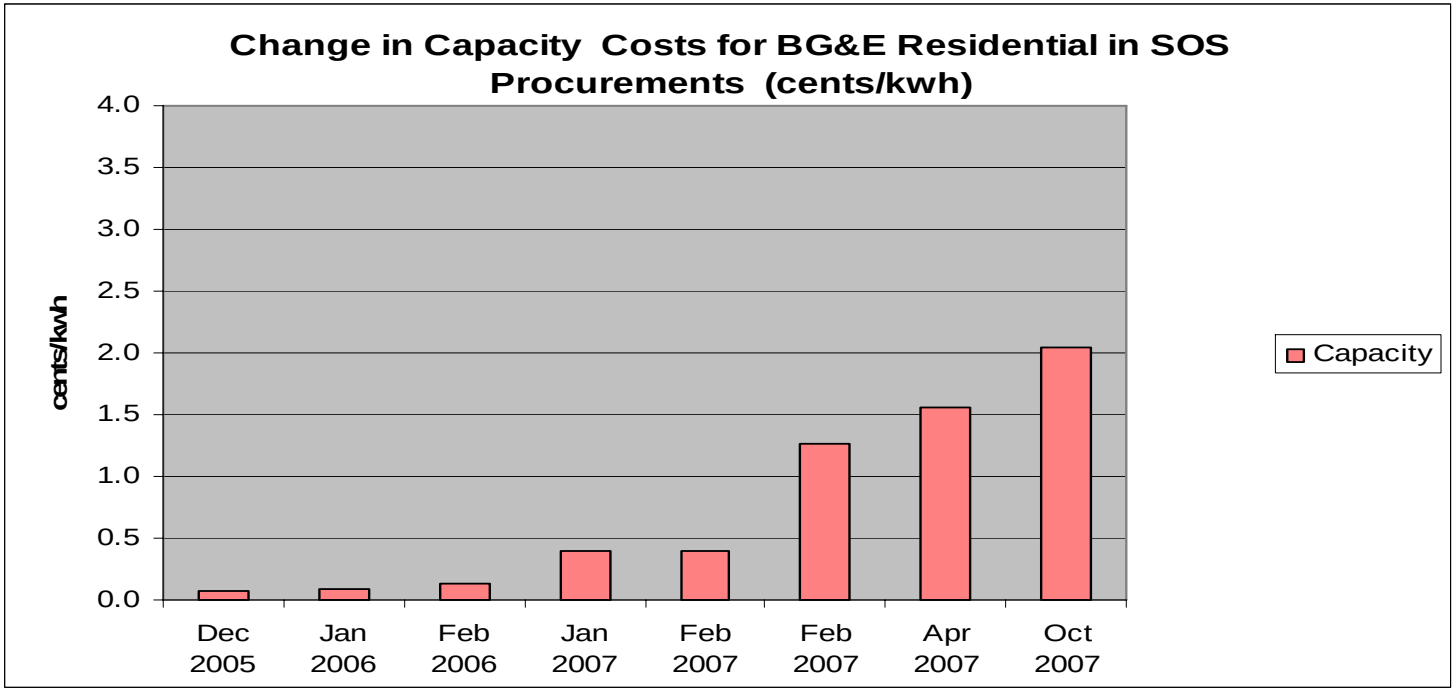
The Second Cost-Driver : Capacity (a/k/a Reliability Pricing Model-RPM)

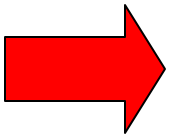
- The Reliability Pricing Model is an additional cost in wholesale rates intended to address PJM's concerns that insufficient generation (i.e. capacity) was being built in some areas.
- By creating additional payments to generators, RPM is supposed to create a financial incentive for the development of new generation.
- RPM is administered through "auctions" for regions within PJM.
- When capacity is in short supply in a particular region, this results in higher clearing prices in the auctions – basic supply and demand.
- Auctions to establish future prices of capacity through 2008-2009 have been held.

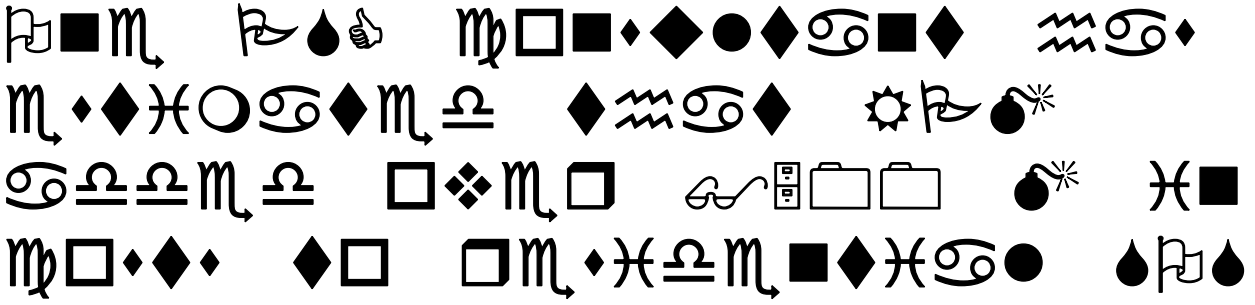
Capacity Prices In Maryland are the Highest in PJM

YEAR	PJM REGION	CAPACITY PRICE
2006 (No RPM)	PJM	$5.73 per MW-Day
2007/2008 (RPM)	PJM SWMAAC (BGE & PEPCO) EMAAC (Delmarva)	$40.80 per MW-Day $188.54 per MW-Day $197.67 per MW-Day
2008/2009 (RPM)	PJM SWMAAC (BGE & PEPCO) EMAAC (Delmarva)	$111.92 per MW-Day $210.11 per MW-Day $148.80 per MW-Day
2009/2010 (RPM)	PJM SWMAAC (BGE & PEPCO) EMAAC (Delmarva)	$102.04 per MW-Day $237.33 per MW Day $191.32 per MW-Day

Impact of RPM on SOS rates







Is RPM solving Maryland's Price and Reliability Problems?

- According to PSC staff, so far the RPM auctions are not adequately addressing Maryland's shortfall -
  - The net change for SWMAAC (PEPCO & BGE) capacity for the three years was an increase of less than 1%.

- According to People's Counsel Expert Jonathan Wallach:
  - "…in all three RPM auctions, the amount of capacity procured for the SWMAAC region has fallen short of the minimum reliability requirements for the region. **Moreover, that shortfall has grown with each successive auction"**

Expert conclusions on RPM's impact on Maryland:

- Kaye Scholer:
  - "Rather than the declining capacity prices that had been predicted and that had been experienced in other part of PJM, **Maryland's capacity prices have increased with no assurances that those prices will do anything to stimulate new generation or demand response"**
- Levitan:
  - " The result of these RPM auctions indicate that the **customers in Maryland will be paying higher capacity costs until** (i) at least **one major transmission line** is completed (ii) **significant in-state generation** capacity is constructed or (iii) **enough demand response** is developed to reduce demand significantly"

Conclusion: To date, the market has not served Maryland's needs

- After 7 years of de-regulation, Maryland faces a capacity shortfall of 1500 MW, and the region is short 6500 MW….

- After 7 years of de-regulation, parts of Maryland have the highest capacity prices and LMPs of the PJM region, increasing SOS rates

Options for Reregulation – Kaye Scholer Report

- The Kaye Scholer Report surveyed the circumstances of other comparable states as they considered and acted on reregulation options.
- The Kaye Scholer analysis illustrates the compelling similarity between Maryland's current situation and those states that undertook various re-regulation actions.
- Key States Examined – Connecticut, Delaware, New Jersey, Illinois

Options for Reregulation – Kaye Scholer Report

- Reregulation: Tradeoffs Among Direct Costs, Risks, and Benefits
  - Investment Risk
  - Market Risk
  - Regulatory Risk
- Current Framework
  - Status quo means continued high RPM and LMPs
  - Status quo favors current generators
  - Investment uncertainty due to T-lines
  - Wholesale market has flaws and inefficiencies

Options for Reregulation – Kaye Scholer Report

- Connecticut Overview after Re-Structuring:
  - Inadequate in-state generation after de-regulation
  - Reliance on older, inefficient generation
  - High congestion costs due to constraints in transmission
  - Growing demand

- Connecticut Reponses:
  - Based on needs assessment, PSC required utilities to issue RFPs for new, long term electricity supply.
  - Projects selected will add 700+ MW new capacity and are projected to lower prices.
  - The state initiated active interventions in wholesale market proceedings at FERC

Options for Reregulation – Kaye Scholer Report

- Delaware Overview after Restructuring
  - Deregulation did not produce lower rates
  - Very little new generation added
  - Substantial transmission congestion
  - Little retail choice
- Delaware Responses:
  - Integrated Resource Planning
  - RFP for long term contracts
  - Demand Side Management

Options for Reregulation – Kaye Scholer Report

- Other states Examined:
  - Illinois
  - New Jersey
  - Michigan
  - New Hampshire

Options for Reregulation – Kaye Scholer Report

- **Option 1: Re-capture previously regulated generation fleet by requiring Utilities to re-purchase Maryland generating fleet, or through condemnation power and fair value payment**
  - Costs: $18-24 Billion
  - Benefits: Return to rate-regulated regime, mitigates some wholesale market costs
  - PSC Recommendation: No

Options for Reregulation – Kaye Scholer Report

- **Option 2: Direct Utilities to enter into Long-Term Contracts (new generation)**
  - Costs: Ratepayers share in O&M costs for generation; contract would most likely include energy price adjuster/inflator, or else high risk premium to supplier; contract may be out-of-the money if energy prices fall; could discourage new merchant generation
  - Benefits: Encourages/establishes new domestic generation in constrained areas of state, lowering RPM & LMPs; helps address reliability concerns; full risks of construction and operations not borne by ratepayers
  - PSC Recommendation: Yes

Options for Reregulation – Kaye Scholer Report

- **Option 3. State Power Authority**
  - Costs: If Power Authority initiates power projects, risks rest with all ratepayers or even taxpayers; may be less efficient than for-profit merchant developer
  - Benefits: Costs can be allocated across all utilities; requires smaller ROR; enhances state control over new generation
  - PSC Recommendation: pending
- **Option 4 . Integrated Resource Planning**
  - Costs: Additional PSC staff plus outside consulting fees
  - Benefits: Coordinated planning of generation, transmission and demand response ensures cost-effective energy resource allocations
  - PSC recommendation : Yes

Options for Reregulation – Kaye Scholer Report

- **Option 5. Aggressive Efforts to shape PJM Wholesale Markets**
  - Costs: Largely outside legal fees + PSC staff dedicated to this function
  - Benefits: Shape PJM and FERC policies on wholesale pricing through interventions in FERC proceedings, litigation, etc. (i.e. RPM, offer capping rules, etc.)
  - PSC Recommendation: Yes (underway)

Levitan Analysis

- Uses an integrated suite of economic, mathematical, and production simulation models.
- Tests the impact of postulated technology, policy, and regulatory initiatives designed to ensure that electricity demand and supply in Maryland remain approximately in equilibrium over the 20-year study period.
- This approach simulates wholesale energy markets in PJM over the long term when different resources are added by technology type in Maryland.
- Consistent with current market rules in PJM, we have differentiated energy and capacity prices by location over the study horizon.
- Develops an EVA, or present value calculation of the Economic Value Added of the various options
- Estimated the long-term retail rate impact by class of service for each of the technology options examined in this study.

Levitan Report – Reference Case

- Represents Maryland's existing generation resource mix, transmission infrastructure, and a limited level of demand side management ("DSM")
- Incorporated about one-fourth of the objective associated with Governor O'Malley's "15 by 15" Initiative – a 15% reduction in per capita energy demand by 2015. (Using "low-case" targets as per PSC)
- Reference Case limits resource additions to peaking plants through 2027 – no new other resources.
- Assumes that each Maryland utility will continue to comply with Maryland's renewable portfolio standard ("RPS"), but will meet only the mandatory solar component through photovoltaic additions within Maryland.

Levitan Report – Supply Alternatives

- **Optimum Mix** – Substitutes more efficient but more costly combined cycle generation plants for peaking plant additions if market conditions warrant. Assumes a long-term contract with Maryland's utilities.

- **Coal –** Adds a 648 MW supercritical pulverized coal plant with state-of-the-art pollution controls in lieu of an equivalent amount of peaking plants. Assumes the new coal plant would achieve commercial operation in 2015 under long-term utility agreements authorized by the PSC.

- **Nuclear –** Adds a new 1,600 MW reactor unit at the Calvert Cliffs facility. Assumes the new plant would be on-line in 2017 under long-term agreements with Maryland's utilities.

Levitan Report – Supply Alternatives

- **15 x 15 DSM** – Adds ambitious conservation and load management initiatives with full achievement of the "15 by 15" Initiative.(Using "low case" targets). This reduces Maryland's dependence on peaking plants to ensure adequate supply, but primarily achieves more efficient use of energy around-the-clock.

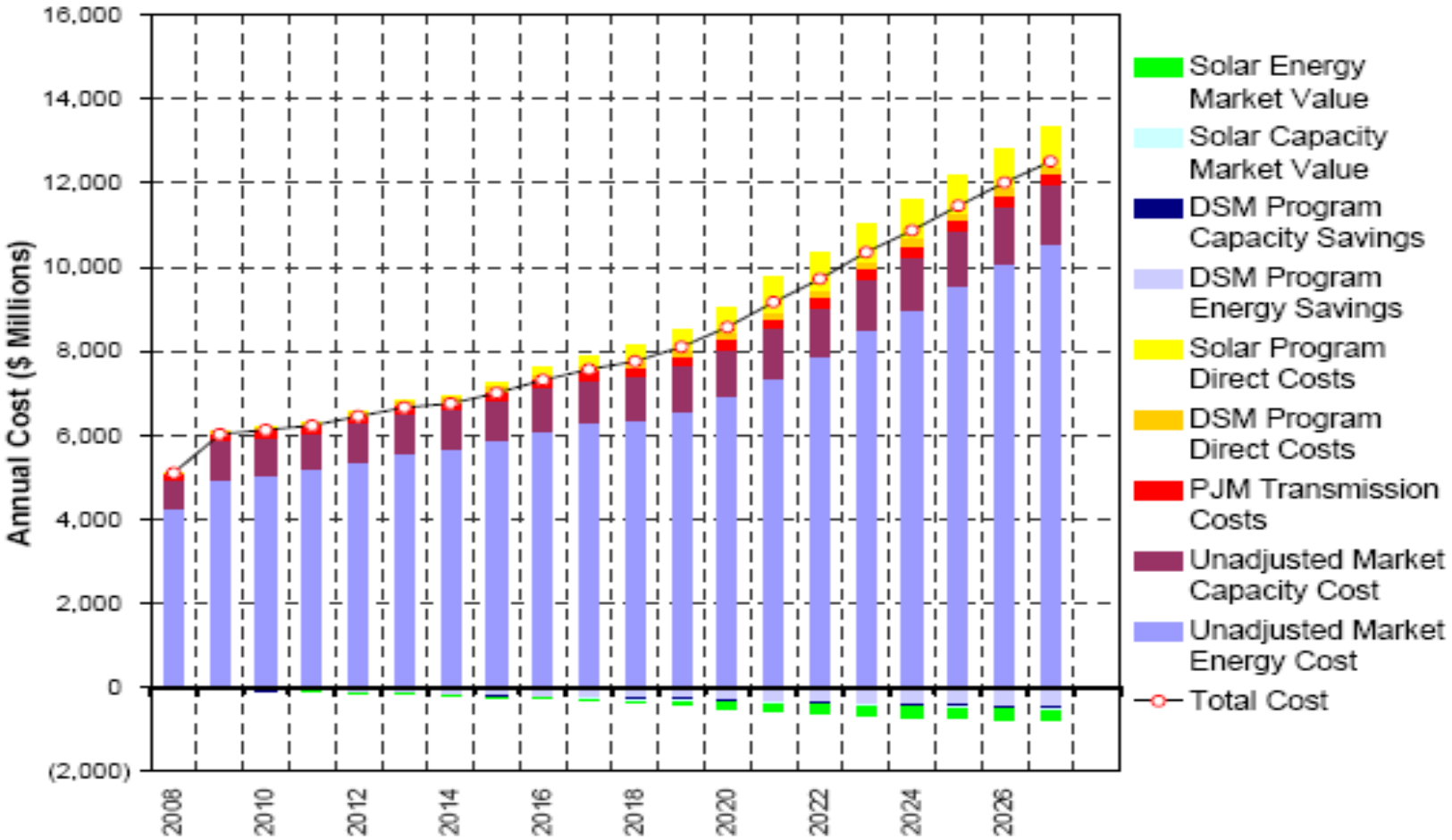
- **Transmission** – Models one new backbone transmission project that will begin serving Maryland in 2015. This addition would lessen Maryland's dependence on new peakers from 2015 throughout the remainder of the study horizon. Under transmission ratemaking principles approved by the FERC the cost of new transmission would be apportioned among ratepayers in Maryland and ratepayers elsewhere in PJM.

Levitan Report – Supply Alternatives

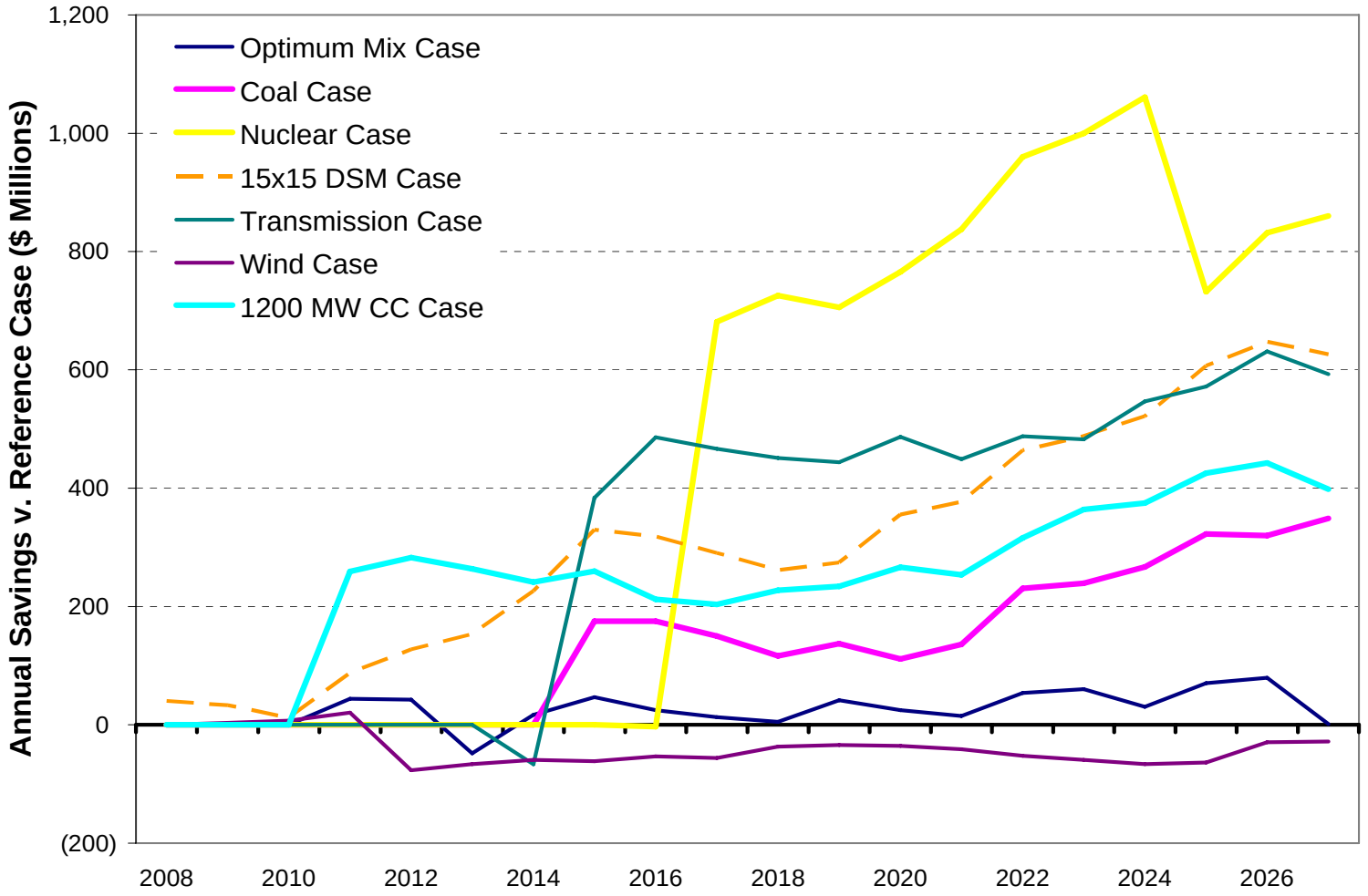
- **Wind –** Adds 500 MW of new wind turbines, both onshore and offshore by 2012. Because wind is intermittent, only about one-fifth of the total nominal installed capacity can be treated as dependable capacity. Therefore, wind only slightly reduce the need for peakers to maintain reliability. We assume that the addition of new wind generation would require long-term agreements authorized by the PSC between wind developers and Maryland's utilities

- **Overbuild –** Adds a generation reserve surplus of 1,200 MW beginning in 2011. Assumes that the reserve surplus will consist of new combined cycle plants in Maryland and will be sustained through the study horizon. Both the 1,200 MW of combined cycle plants as well as gas turbine peaking plants added later to the resource mix would require long-term contracts with the utilities

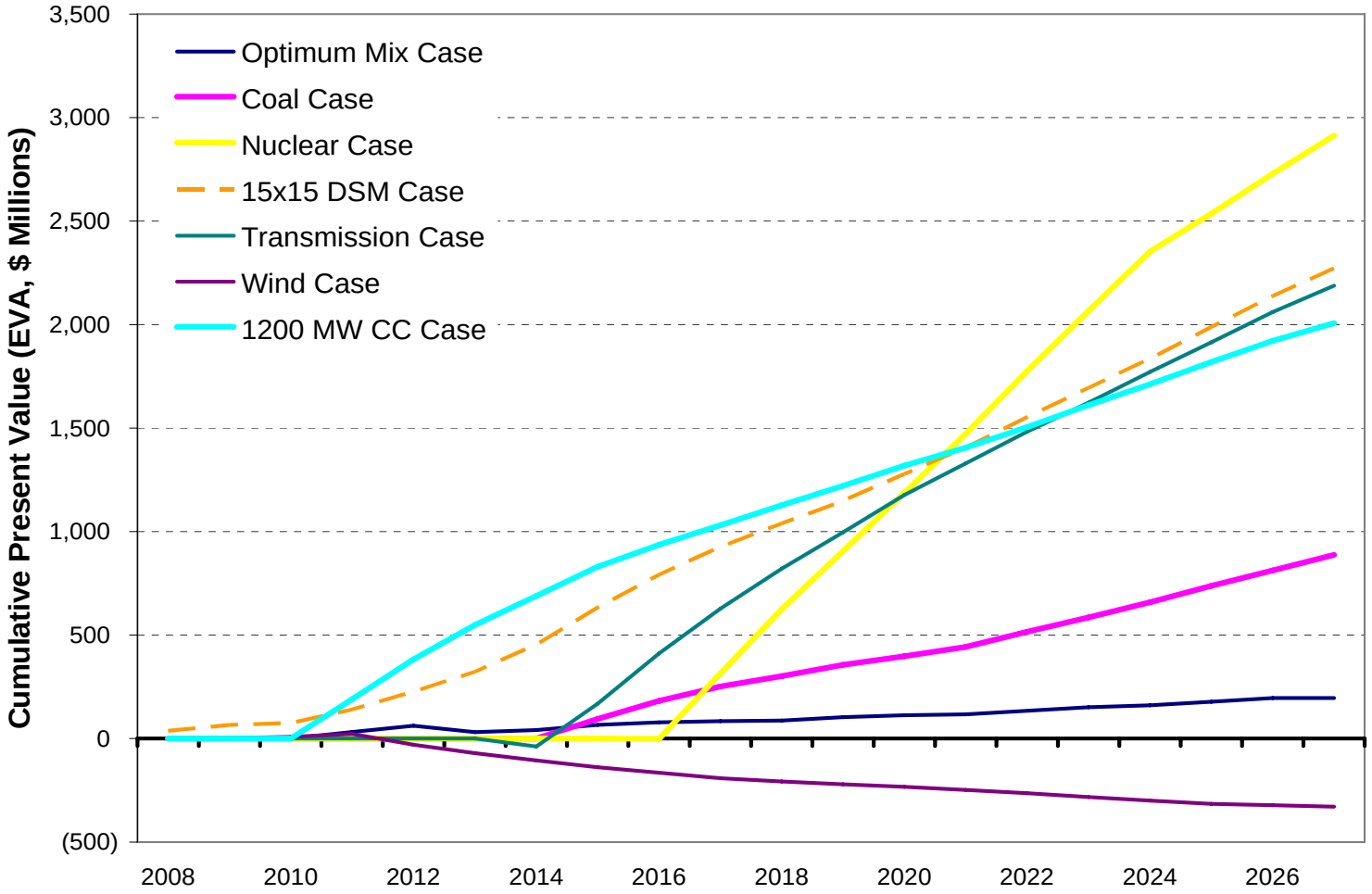
Reference Case Annual Costs



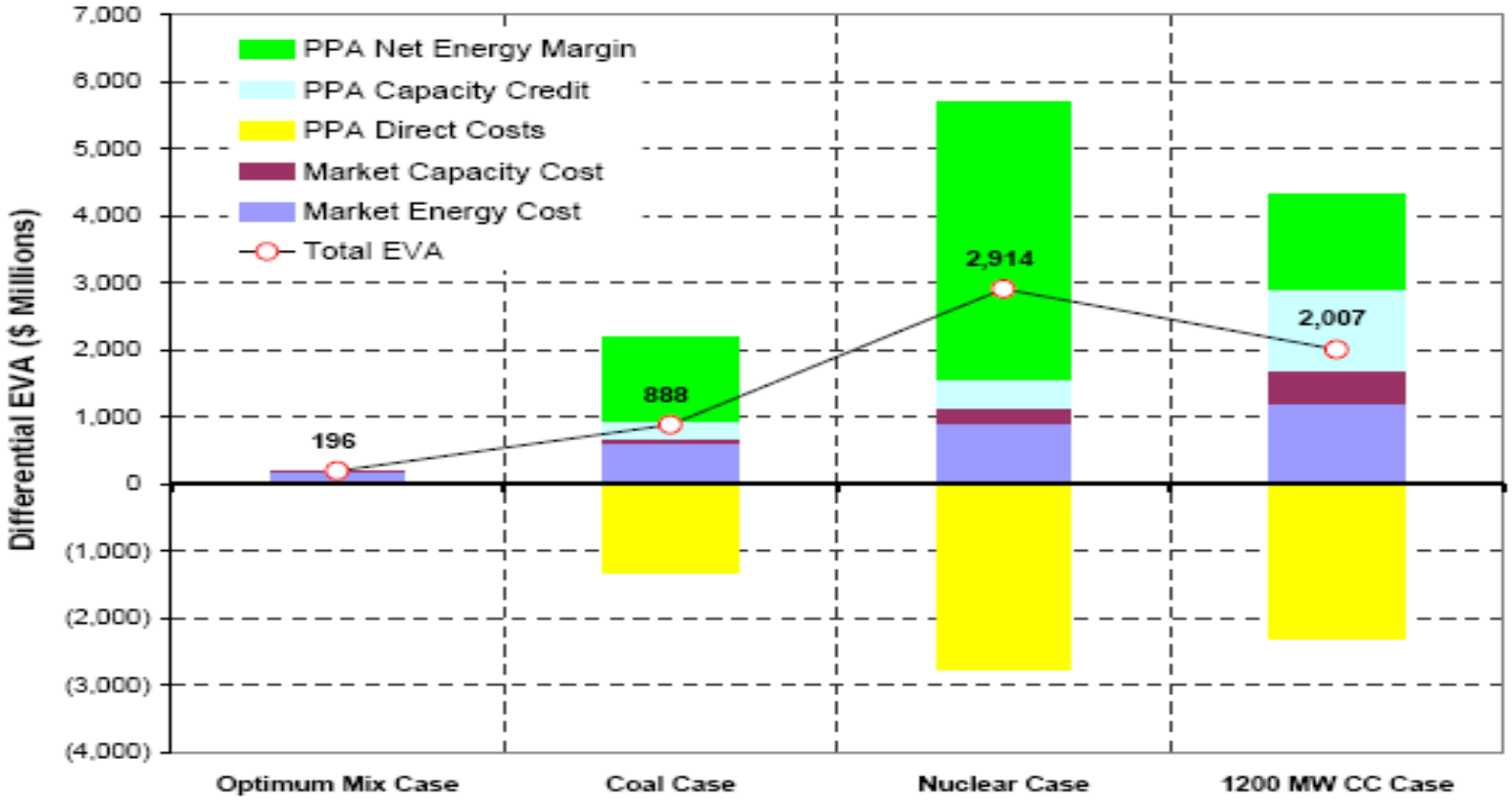
Annual Savings for Alternative Cases



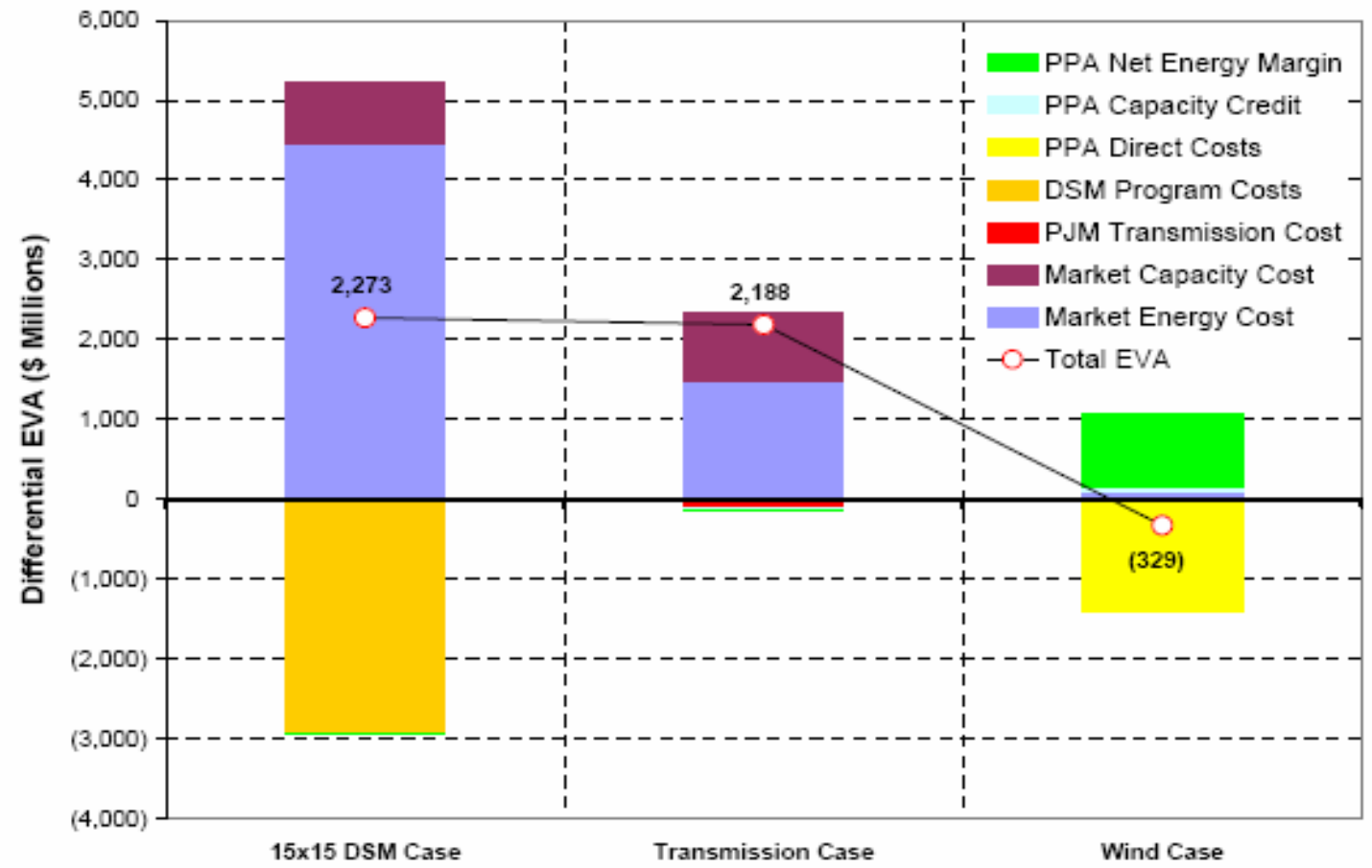
Cumulative EVA



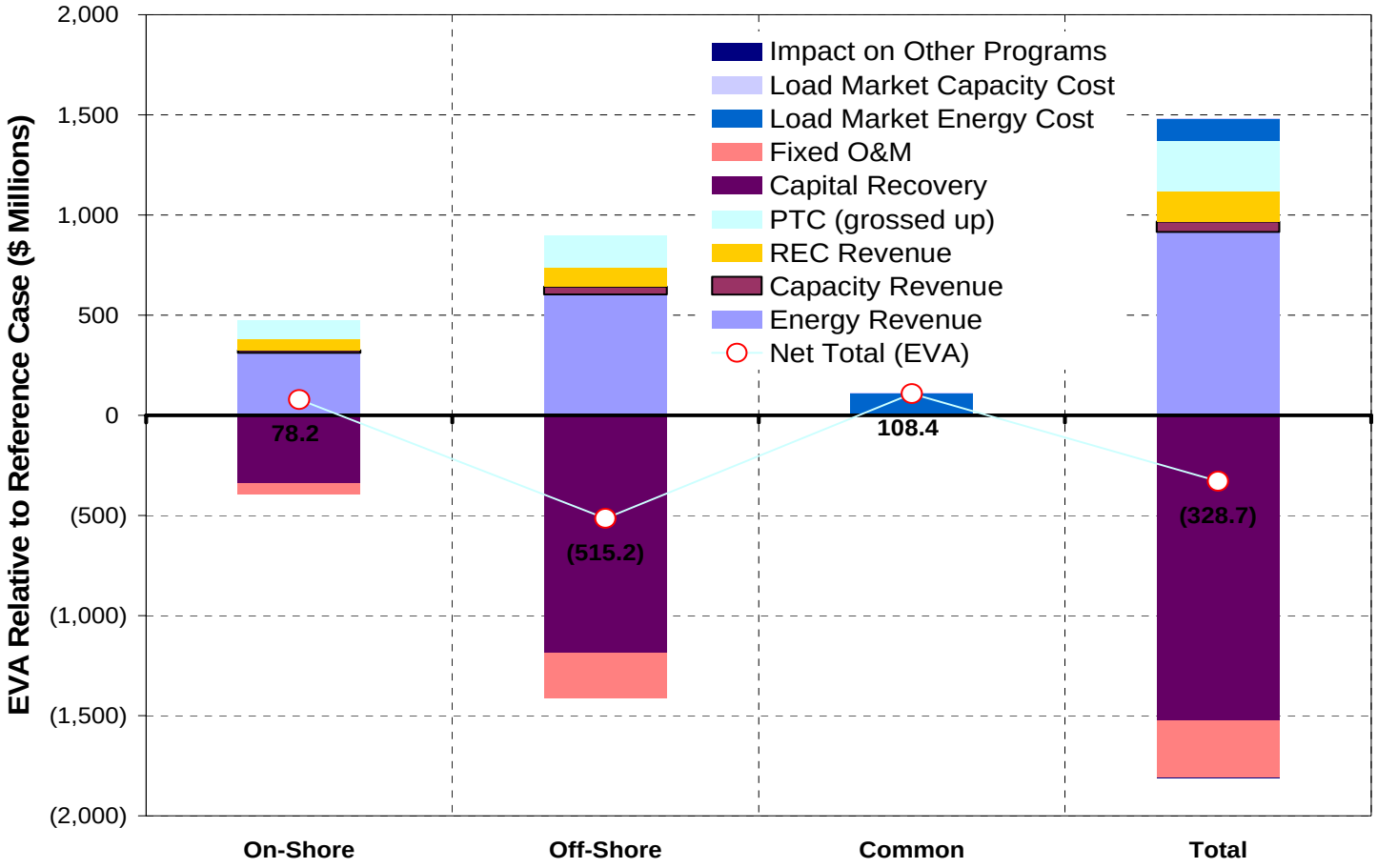
EVA by Component – Generation Case



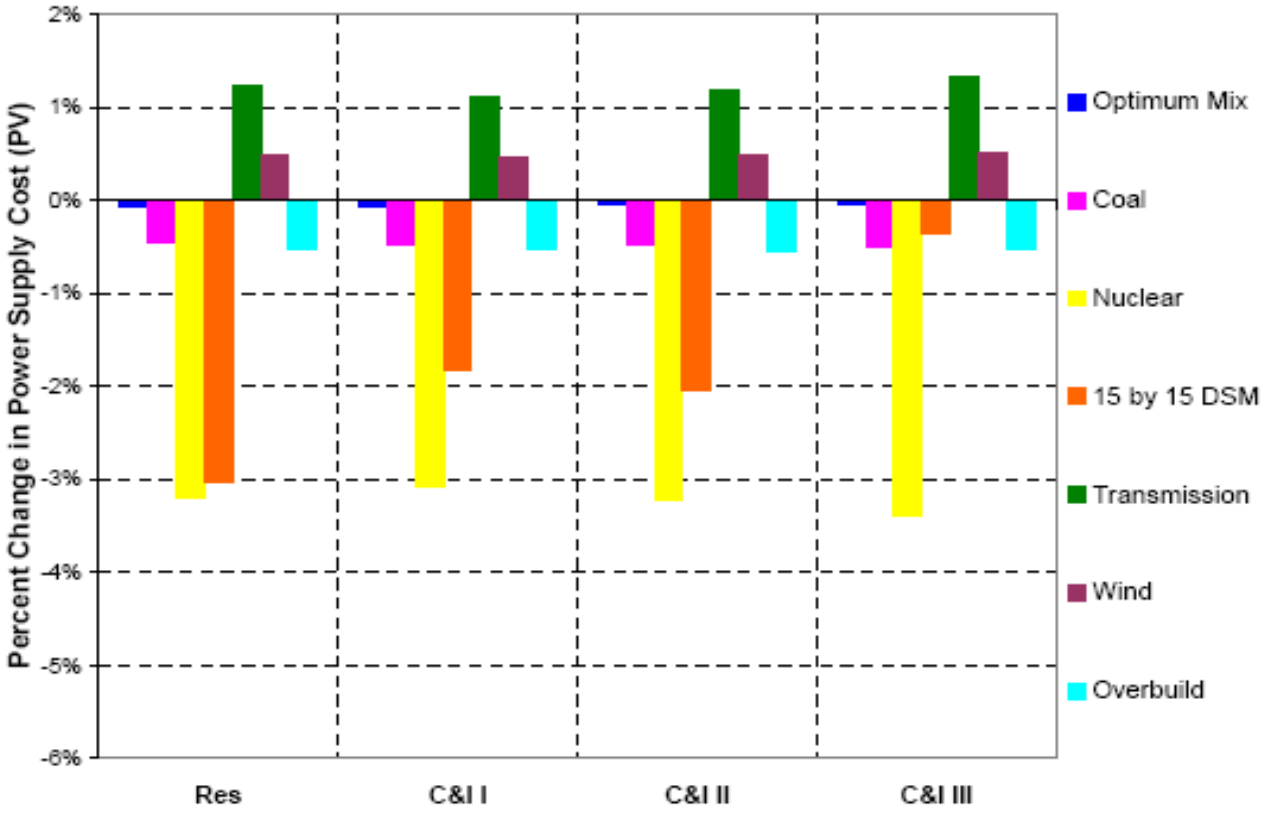
EVA by Component – Non-Traditional Cases



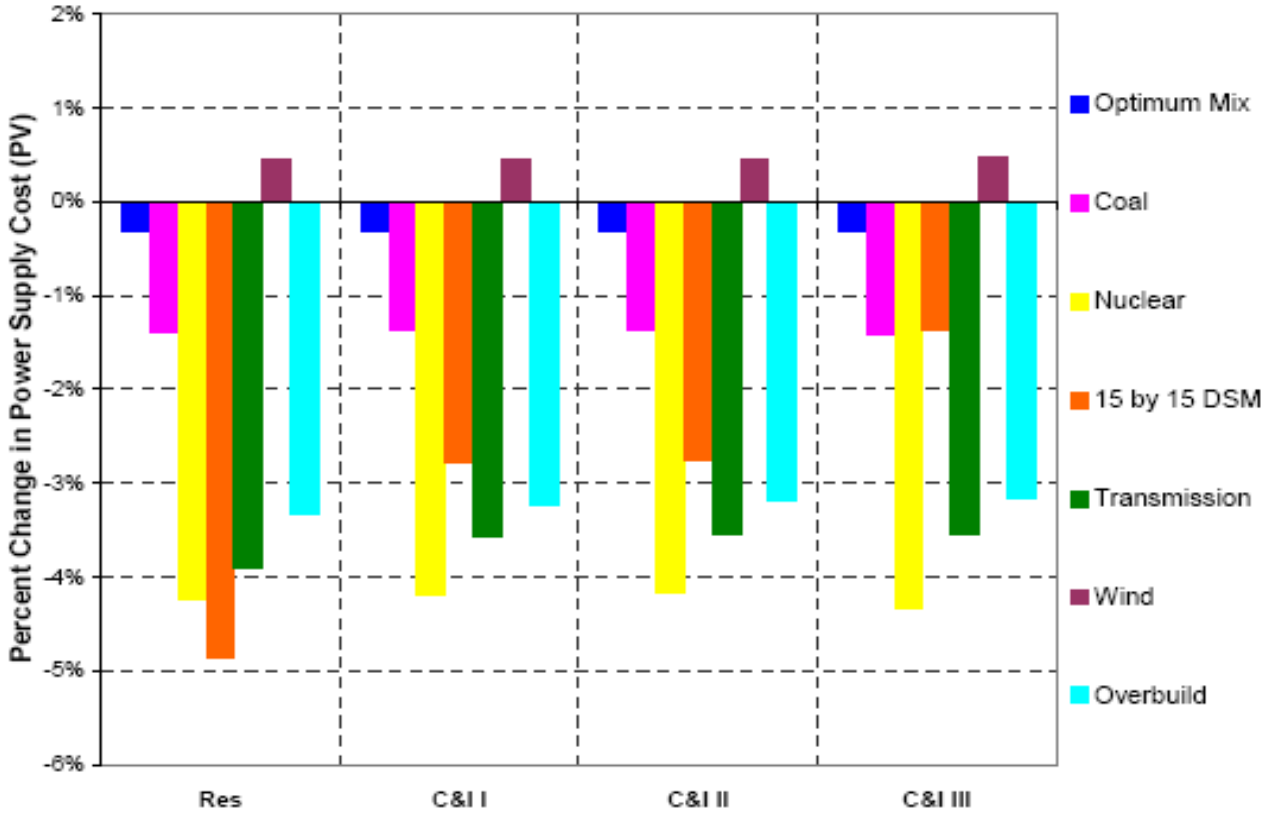
Breakout of Off-Shore vs. On-Shore Wind



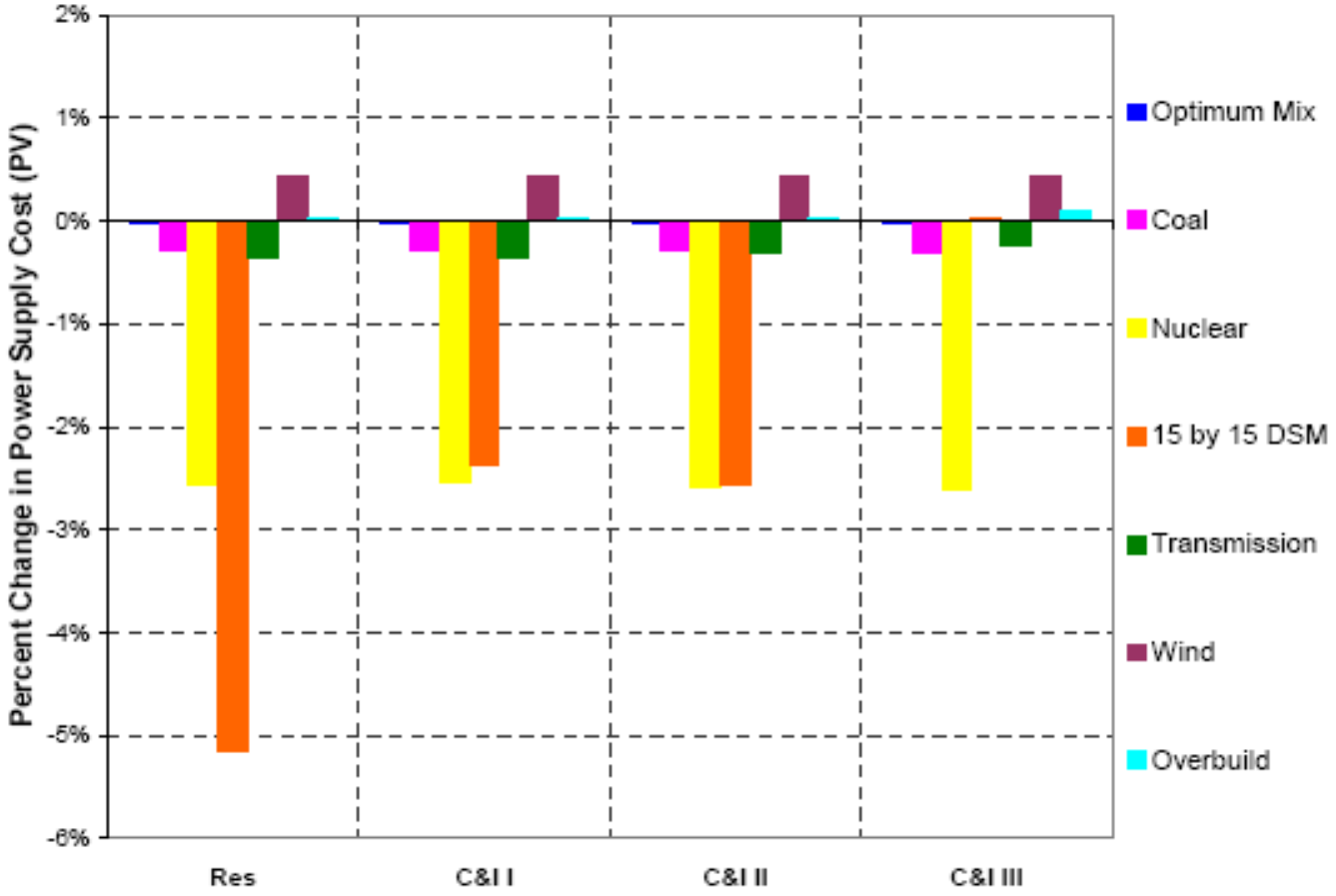
Change in Allocated Power Supply Cost - Allegheny



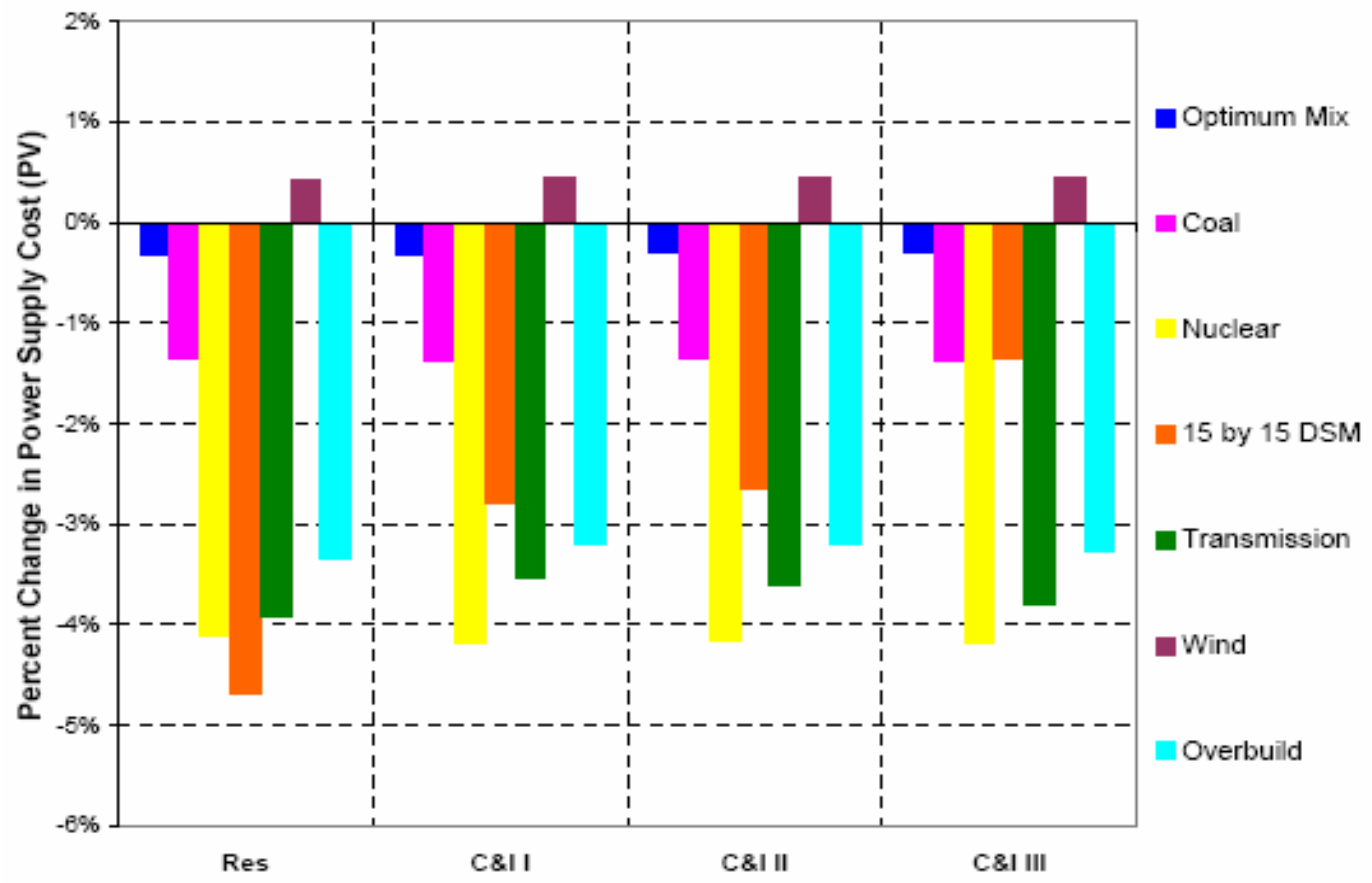
Change in Allocated Power Supply Cost - BGE



Change in Allocated Power Supply Cost - Delmarva



Change in Allocated Power Supply Cost - PEPCO



Conclusion and Next Steps - Reregulation

- The prospect for new, material transmission expansion such as the TrAIL or PATH lines is uncertain.
- Maryland must take action on its own to address the reliability issues we face and secure the lowest possible rates for ratepayers.
- In Case No. 9117, several parties – including the Maryland Energy Administration, the Office of the People's Counsel, and Staff for the PSC – agreed that the State must prepare for the potential shortfall in capacity for the 2011-2012 timeframe **by directing the utilities to develop RFPs for new generation that could be issued by the summer of 2008**.
- As other state PSCs have done, we plan to move forward with this option, as permitted under current law, to address capacity shortfalls and price concerns.

Conclusion and Next Steps – Reregulation (cont'd)

- We plan to implement the long-term contracting strategy over the next 6-9 months.
- Before directing the utilities to issue RFPs for longer term contracts for generation, the PSC will monitor and evaluate the next two RPM auctions for the planning years 2010-2011 and 2011-2012 to determine the shortfall, and model the impacts of additional capacity beyond the minimum required for reliability purposes.
- The RPM auctions take place in January 2008 and May 2008.
- We will devote the intervening time to a more in-depth study of the specific components and contents of the RFP so that we could direct the utilities to issue Requests for Proposals after the May 2008 auction.
- We will seek the input of stakeholders and affected parties.

The Role of Conservation and Demand Management

- The PSC directed the investor owned utilities ("IOUs") in Case No. 9111 to file conservation, energy efficiency and peak demand reduction plans to address the Governor's EmPower Maryland Goal of a 15% per capita reduction in usage by 2015 ("15 by 15")

- The PSC provided a range of energy savings targets: a "low case" of electric usage reduction targets for 2015 of 8,625 GWh (billion watt-hours) using the PPRP's load forecast (about 0.6% annual rate of growth in consumption) and a "high case" goal of 17,936 GWh using historic growth rates (about 1.9% annual rate of growth)

The Role of Conservation and Demand Management

- Utility plans achieved 40% of PPRP forecast based EmPower Maryland goal and 19% of high forecast case goal.
- Savings totals are estimates based on different assumptions and approaches made by each utility
- Plans assume larger commercial and industrial customers achieve usage reductions through energy service providers, their own energy management actions and investments or other non-utility based means
- Plans did not address other non-utility actions such as appliance standards, building codes or programs that might be implemented by state or local government

The Role of Conservation and Demand Management

- Total cost through 2015 for four utility plans were approximately $760 million.
- Cost is only for conservation and energy efficiency programs, does not include advanced metering costs.
- Costs based on differing approaches and assumptions made by each utility.
- Cost effectiveness still under review by PSC

The Role of Conservation and Demand Management

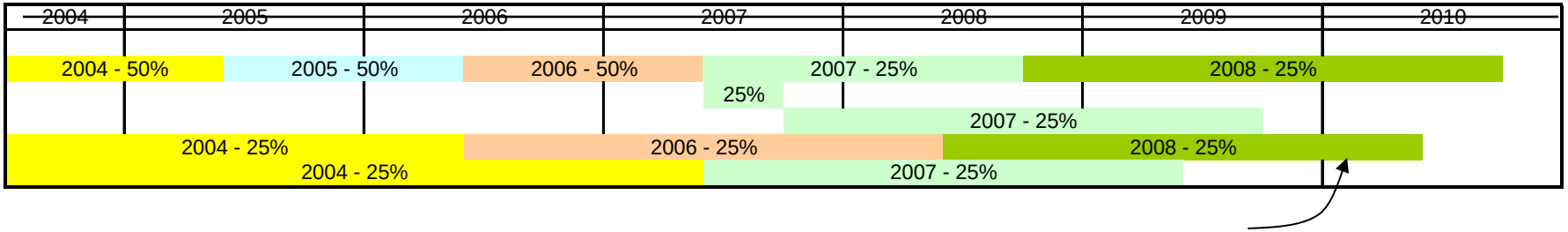
- Proposed programs generally updated versions of those offered by utilities in the 1990's
- Significant emphasis on compact florescent bulbs
- New and replacement appliance, window AC and central AC/heat programs
- New home and building construction programs
- Existing home and building efficiency improvement programs (for example windows and insulation)
- Programs generally based on customer rebates and incentives combined with training/conservation message

Update on Possible Changes to SOS Procurement Process

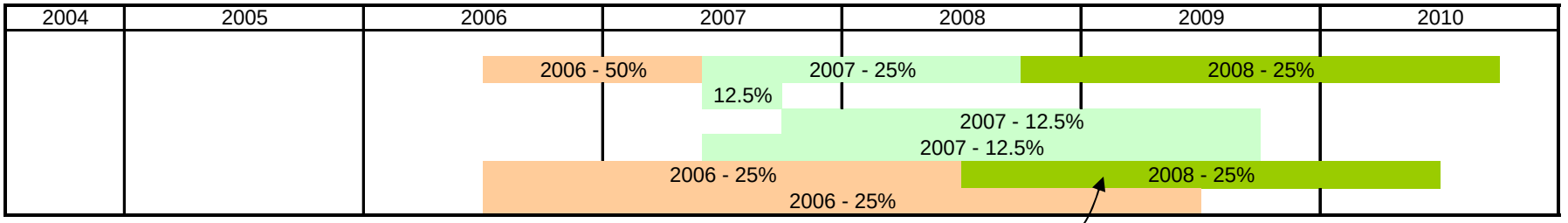
- The PSC opened proceedings to examine the current SOS procurement process

- Current Process:
  - Auction 2x per year for 25% of load
  - PSC oversees utility auctions
  - Bidders offer **full requirements** contracts
  - Sample Bidders: Hess, FPL, Con Ed, Constellation

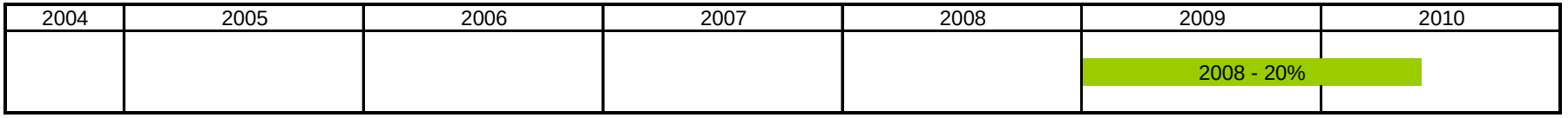
Profile of Current Utility Procurement Plans



- PEPCO and DPL recently purchased 12.5% of their June 2008 requirement



- BGE recently purchased 12.5% of their June 2008 requirement



- AP is initiating SOS in January 2009 and is buying 20% of that requirement

Update on SOS Procurement (cont'd)

- The PSC has received extensive testimony regarding the costs and benefits of the current wholesale auction process.
- Full requirements bids include risk premiums for suppliers that can exceed 10%, but are usually less.
- These risk premiums or margins add to the cost of SOS service, but create more price certainty. This is the basic trade-off.

Update on SOS Procurement (cont'd)

- The current auction process does not allow utilities to take advantage of advantageous market conditions – such as when spot prices are lower than future prices.
- Some testimony received by the PSC suggests that some reliance on the spot market could lower SOS rates – if done prudently.
- SMECO utilizes a managed portfolio approach; the PSC received testimony suggesting that approach could save on SOS rates.
- Pennsylvania recently approved such an approach for a small utility.
- The regulatory goal is to optimize the trade-off between stability and low prices… a managed portfolio process may do that.