Earth Day
Howard Community College

Doug Nazarian

April 21, 2009

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Supply v. Demand

- Generation – new power plant(s)
- Transmission – increase ability to bring electricity from elsewhere
- Conservation/energy efficiency and demand response – reduced usage = “negawatts”

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Conservation/Energy Efficiency and Demand Response

- Conservation – use less, *i.e.*, turn it off
  - Greater vigilance at home and at work
- Energy efficiency – replace older, less efficient appliances with newer, more efficient ones
  - EmPower Maryland Act programs
- Demand response – get paid to curtail usage during times of peak demand
  - BGE Peak Rewards
  - Commercial/industrial curtailment, distributed generation
- Future: advanced metering/"smart" grid and appliance technology, dynamic pricing

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Biggest energy users

- Heating and cooling
  - Heating fuel? Natural gas v. heating oil v. electric heat pumps
  - Thermostat – electronic/programmable (and someday “smart”)
  - Insulation and windows
  - Replace old/inefficient units with new, efficient ones
- Hot water
  - Low-flow shower heads
  - Thermostat – lower the temperature
  - Insulation
- Consumer electronics
  - More and bigger, especially TVs – LCDs are more efficient
  - If you see a light, it’s drawing power
- Lighting
  - Replace incandescent bulbs with compact fluorescents or LEDs
- Appliances
  - Look for Energy Star logo

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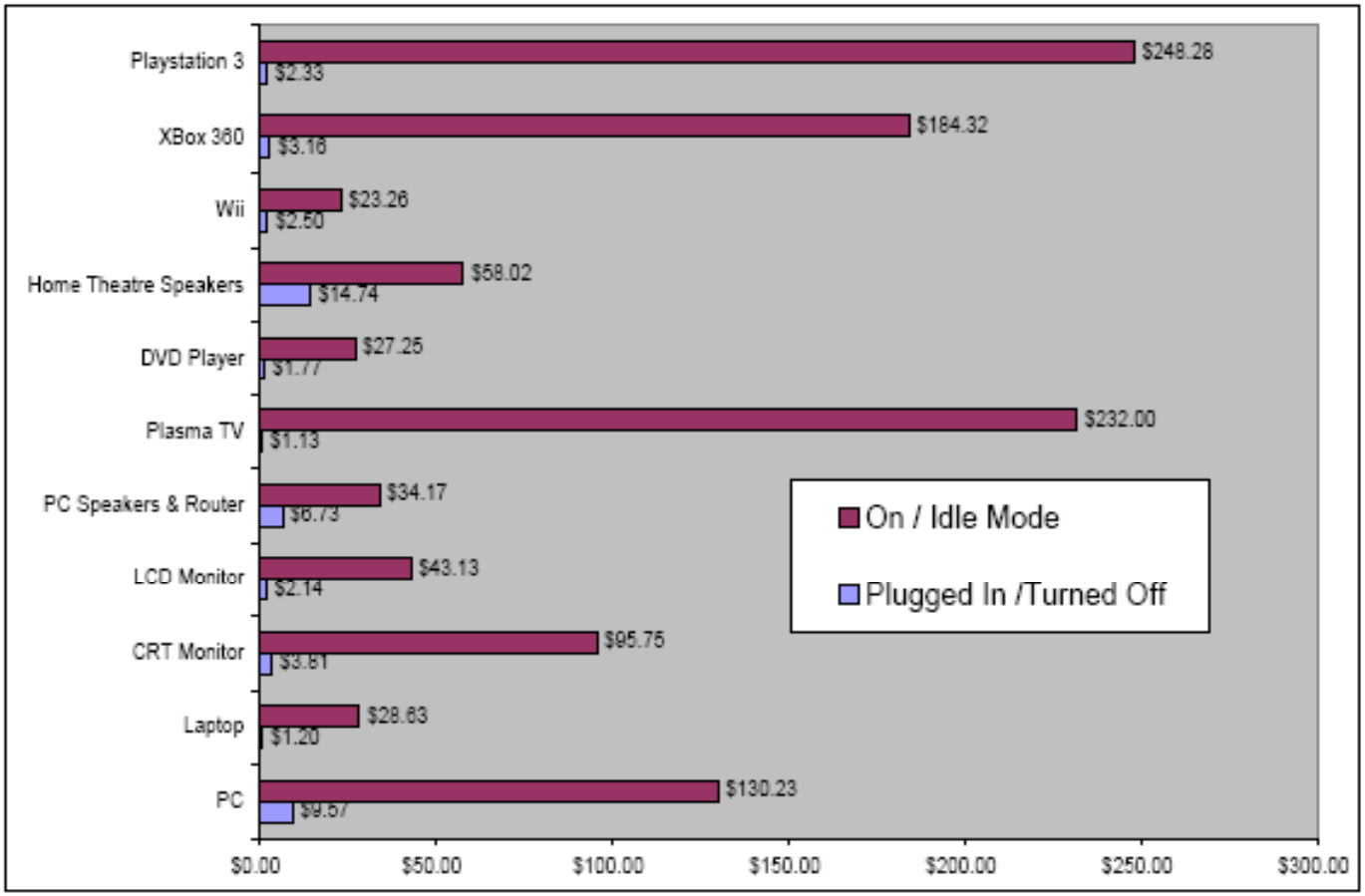
Opportunities to Achieve Reductions Through Consumer Education are Significant

Just One Example… So-Called "Vampire" Electricity Consumption



"Switch It Off"

- Survey by Choice Computer Magazine, May 2008 (based on 15 cents/kwh)
- Placing equipment in standby/off mode can significantly reduce power consumption
- Modern video games can consume as much power as several refrigerators
- "Many electronics manufacturers are not required to reveal energy consumption on energy packaging… so consumers are left in the dark"

EmPOWER Maryland Act of 2008

- The Act directed the Commission to have utilities propose cost-effective energy efficiency programs designed to reach energy reduction targets:
  - 10% reduction in consumption (from 2007 levels) by 2015
  - 15% reduction in peak demand (from 2007 levels) by 2015
- The Commission approved programs on December 31, 2008
  - BGE programs approved for implementation – rollout May 2009
  - Other utilities' programs approved as to design, finances will be finalized this quarter
  - Home energy audits, rebates or buydowns on bulbs and appliances, building retrofits, low-income programs
- Federal tax credits may also be available – see http://www.energystar.gov/index.cfm?c=products.pr_tax_credits

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"Re-regulation"

- Three reasons (not mutually exclusive) to "re-regulate" to some degree
  - Reliability – if markets do not deliver the generation, transmission or demand response Maryland needs to ensure a reliable supply
  - Economics – if markets do not deliver resources that would reduce prices and rates and bring benefits to ratepayers
  - Policy – to incent resources (*e.g.*, new generation or renewables) the markets won't deliver *or* to change policy direction

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Status of "re-regulation"

- No change in legal/regulatory landscape this Session
  - The Senate passed a *prospective* "re-regulation" bill
  - The House didn't, but Economic Matters Committee members expressed concerns about the *status quo* – issue is likely to resurface
- The inherent policy tension remains
  - *Compare* the Electric Customer Choice and Competition Act of 1999 – "The General Assembly finds and declares that the purpose of this subtitle is to: (1) *establish customer choice*…; (2) *create competitive retail electric supply and electricity supply services markets*; (3) *deregulate the generation, supply and pricing of electricity*; (4) provide economic benefits to all customer classes; and (5) ensure compliance with federal and State environmental standards." Public Utility Companies Art. § 7-504 (emphasis added).
  - *With* S.B. 1, 2006 Special Session – "In order to meet long-term, anticipated demand in the State for standard offer service and other electricity supply, the *Commission may require or allow an investor-owned electric company to construct, acquire, or lease, and operate, its own generating facilities*, and transmission facilities necessary to interconnect the generating facilities with the electric grid, subject to appropriate cost recovery." Public Utility Companies Art. § 7-510(c)(6) (emphasis added).

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Constellation/Electricité de France

- Proposed transaction – EDF would purchase an interest in Constellation's nuclear subsidiary
  - Follows decision not to close proposed acquisition by MidAmerican Energy Holdings
- Issue before the Commission: Would the transaction give EDF the ability to exercise "substantial influence over the policies and actions" of Constellation and/or BGE?
  - If so, the transaction cannot close without Commission approval, *i.e.*, a further proceeding to determine whether the transaction is in the public interest
  - Hearings on "substantial influence" begin April 27, and the Commission will decide the issue by June 8

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Generation in Maryland

- Maryland is a net importer of electricity – approximately 30% comes from outside the State
- Central and Eastern Maryland sits in a constrained portion of the grid
  - This limits the amount we can export from the West and makes electricity expensive here
  - Capacity and congestion are significant components of wholesale cost
- Current fuel mix serving Maryland's demand: 59.4% coal, 28.7% nuclear, 4.1% natural gas, 3.3% hydroelectric, 2.0% petroleum, 1.2% other renewables, 1.4% other

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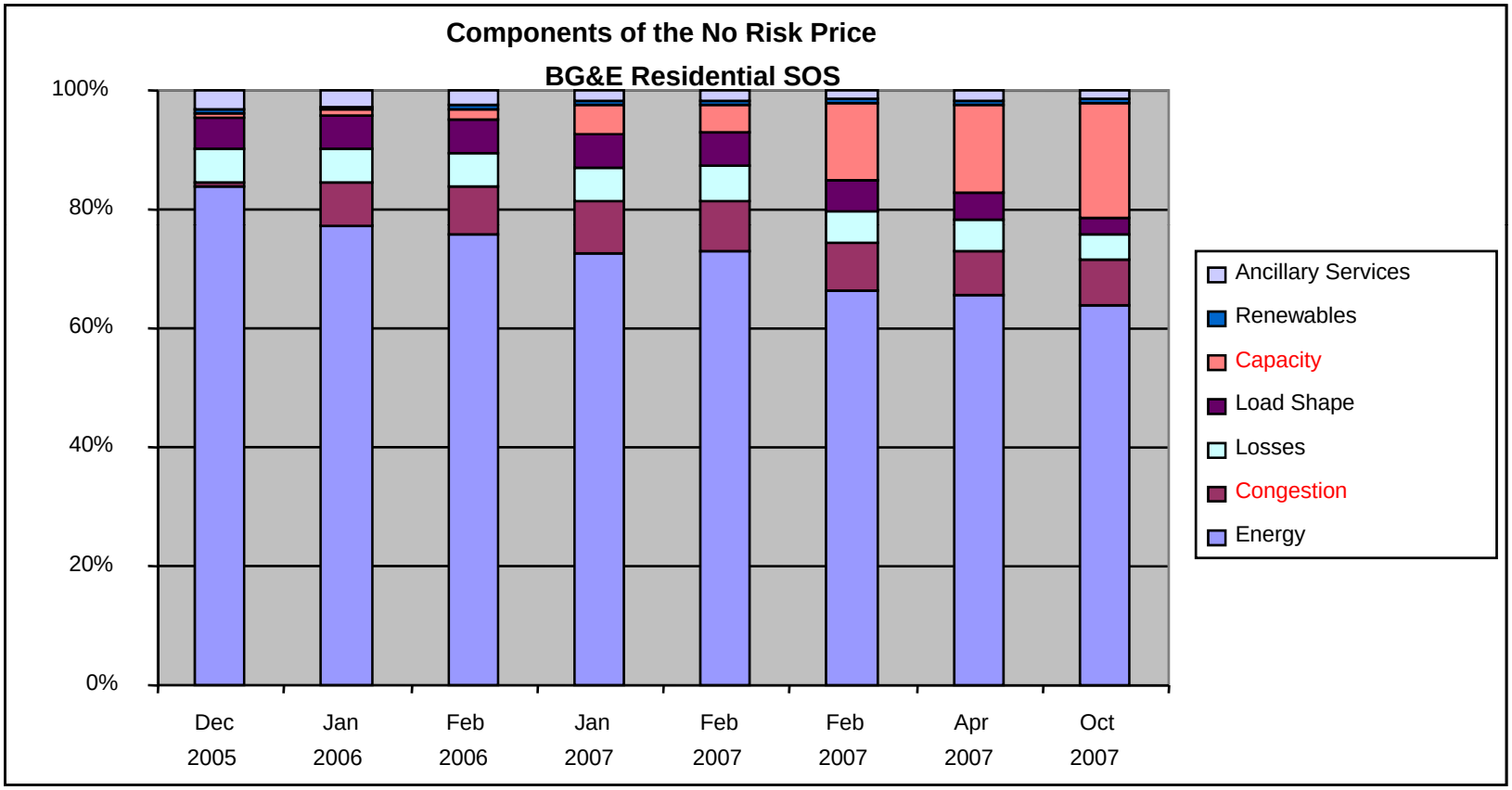
Impact of Congestion and Capacity on Wholesale Prices



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.

Current and future generation in Maryland

- Generation is no longer regulated – although the Commission can order it, deregulation envisions that the marketplace will deliver the supply Maryland needs
- Other policies influence whether and when and what new generation will be built
  - Environmental laws – Healthy Air Act, Regional Greenhouse Gas Initiative, Greenhouse Gas Reduction Act
  - Renewable Portfolio Standard – requires 20% from renewables by 2022
  - Wholesale market rules – Reliability Pricing Model

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New generation in Maryland?

- The Commission has concluded, based on consultants' economic modeling, that another 1,080 MW in Central or Eastern Maryland would yield economic benefits for ratepayers
  - Approximately 2 medium-sized power plants
  - Increasing supply will reduce capacity and congestion components of wholesale cost
  - Transmission line projects will help too

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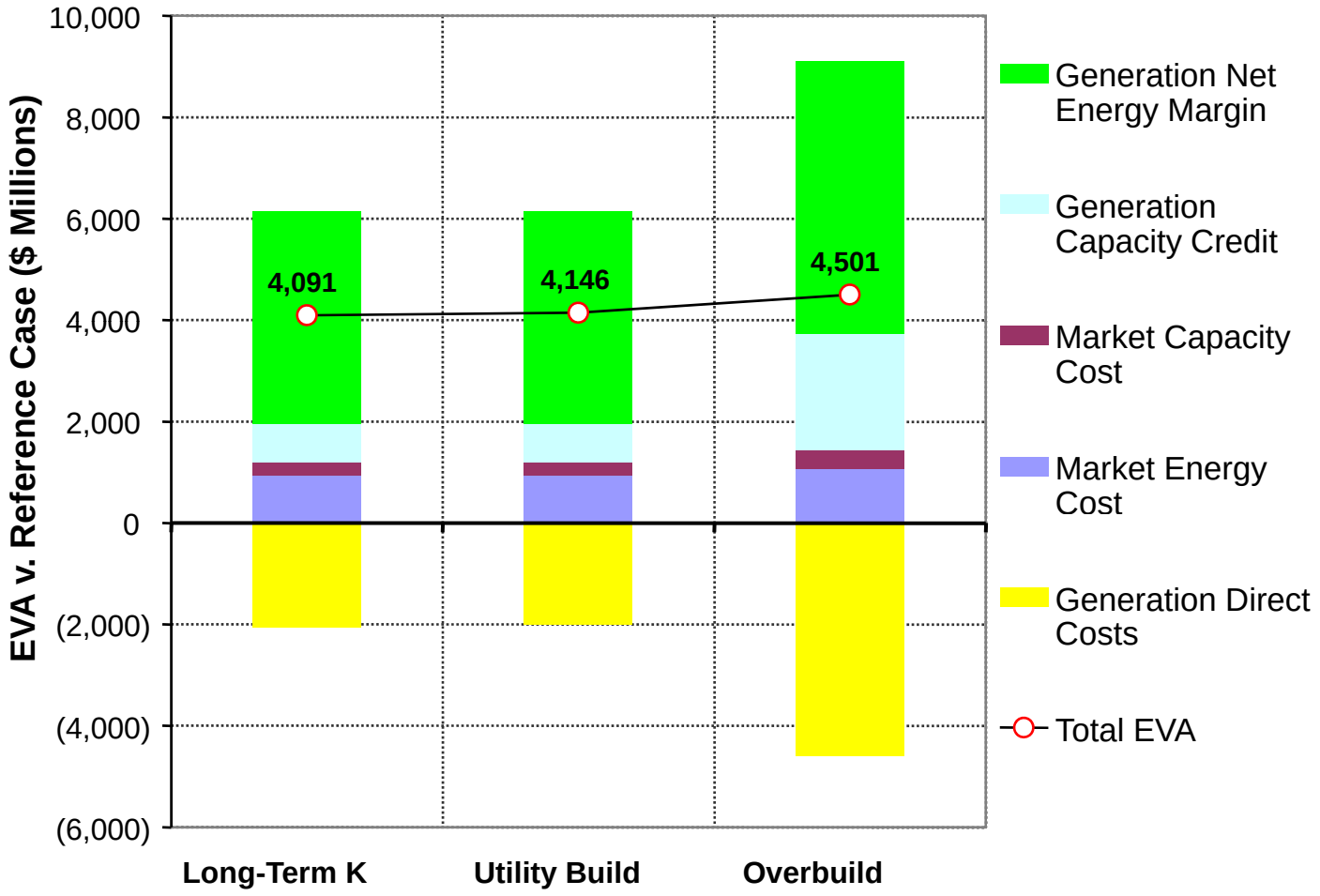
Conventional Generation (2008 Levitan report)



The next plant(s)?

- The Commission will investigate new generation and, if appropriate, order one or more utilities to build or acquire it
  - Need to evaluate likelihood of transmission lines and proposed generation projects coming on line, ensure the right mix
- But: Who will finance?
  - Wholesale market is supposed to "signal" need for new generation, but it isn't happening
    - 2011-12 reliability shortfalls – Commission had to respond
    - Incumbent generators are unlikely to build anything that'd bring prices down
  - Lenders require a revenue stream – *e.g.*, a long-term contract for the output – which is inconsistent with deregulation model
    - Commission-ordered regulated generation or change in SOS procurement may be required
- What fuel(s)?
  - Coal – abundant and least expensive to build and run, but raises carbon issues
  - Natural gas – Clean, but fuel price can be volatile
  - Nuclear – large economic upside, but expensive and time-consuming to build and risky – no new nuclear plants in the US since 1979
  - Renewables?

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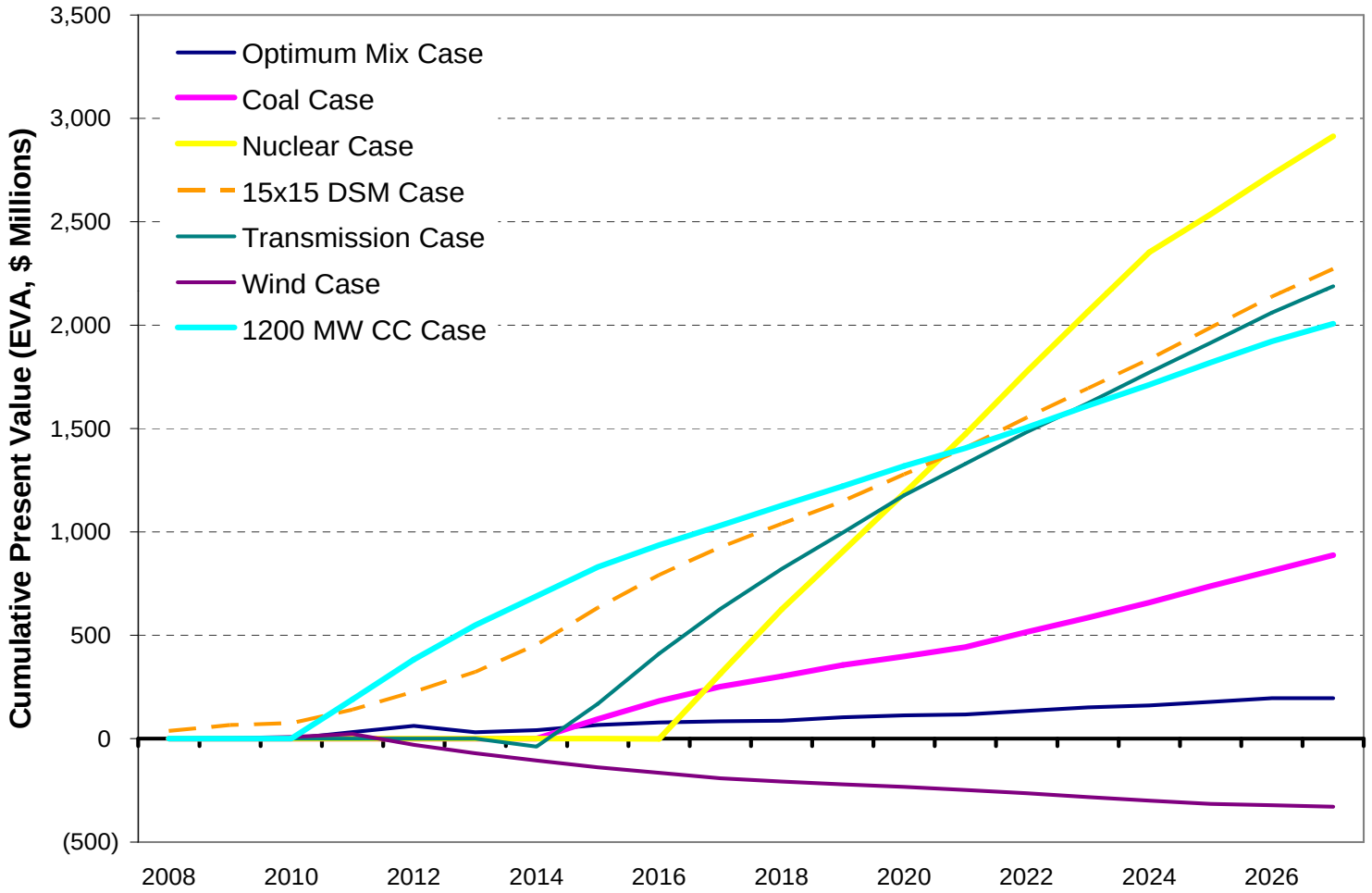
Economic benefits from new generation (2007 Levitan Report)



Renewables

- The Commission's modeling demonstrates that economic benefits from renewables, viewed entirely on their own, remain uncertain and challenging
  - Onshore wind yields net economic benefits, albeit on a small scale
  - Offshore wind as modeled does not yield economic benefits
  - The overall economics of solar remain negative, but could improve if technology progresses much faster than contemplated in the study and various financial incentives continue over the long term

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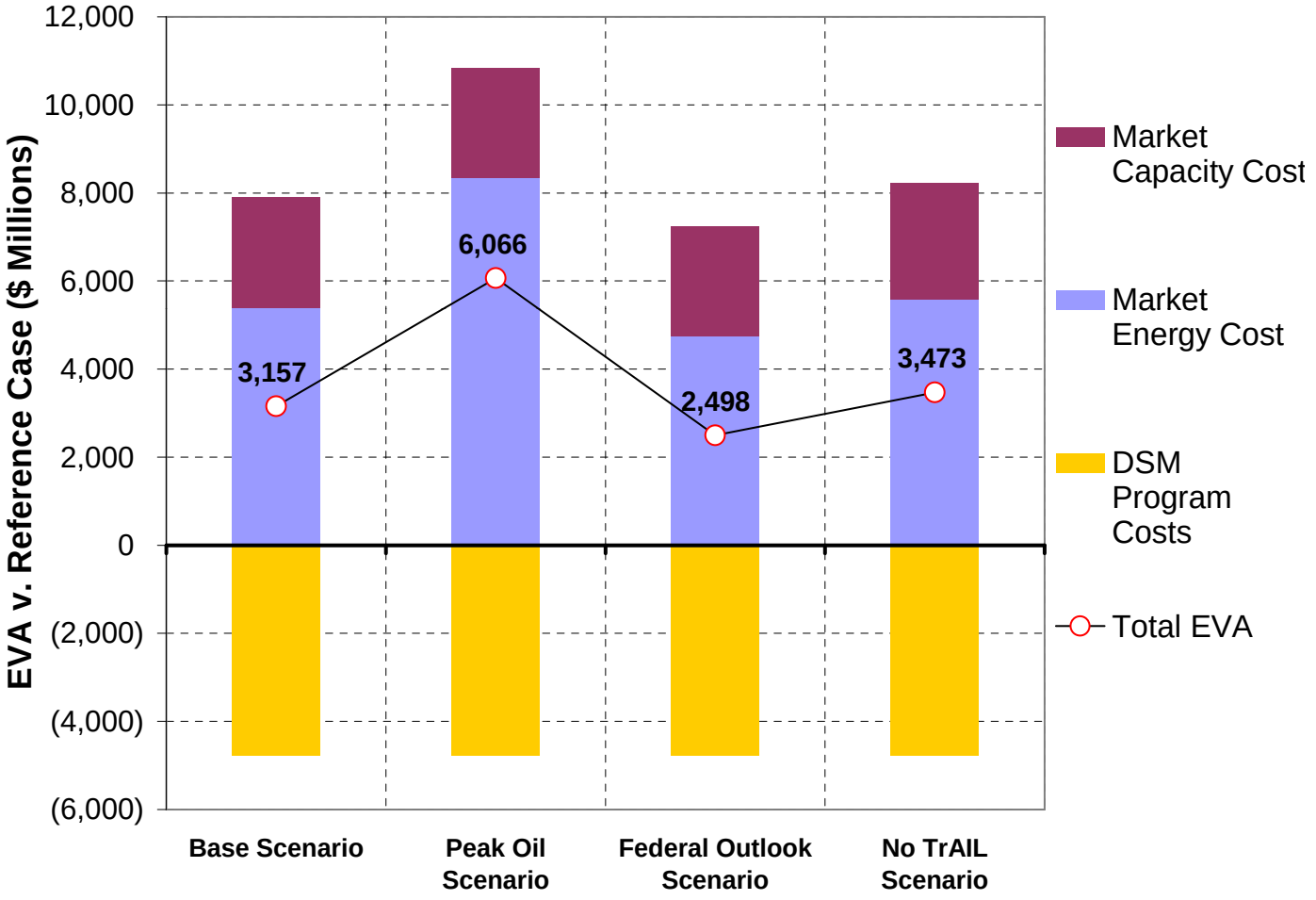
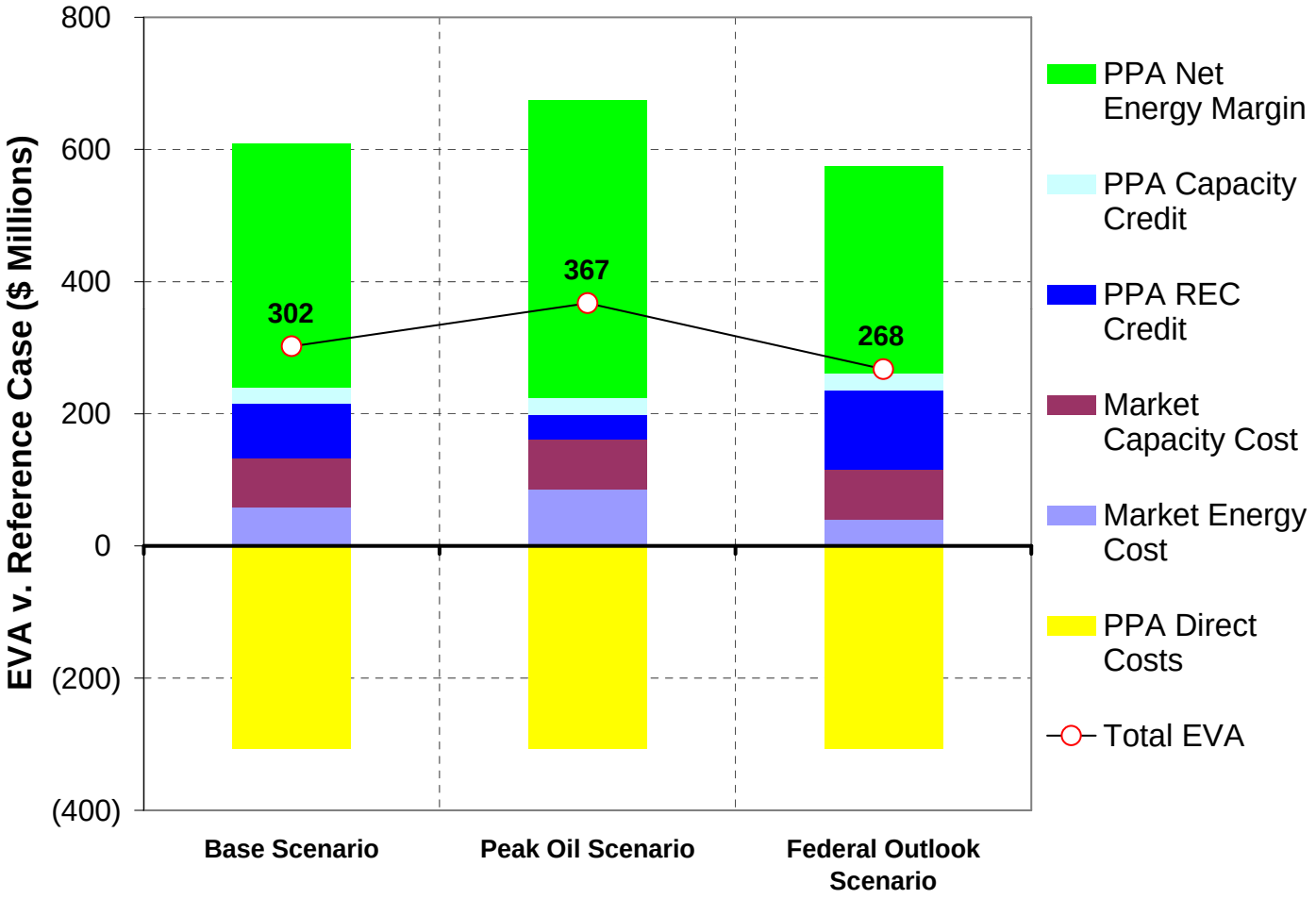
Demand Side Options (2008 Levitan report)



On-Shore Wind (2008 Levitan report)



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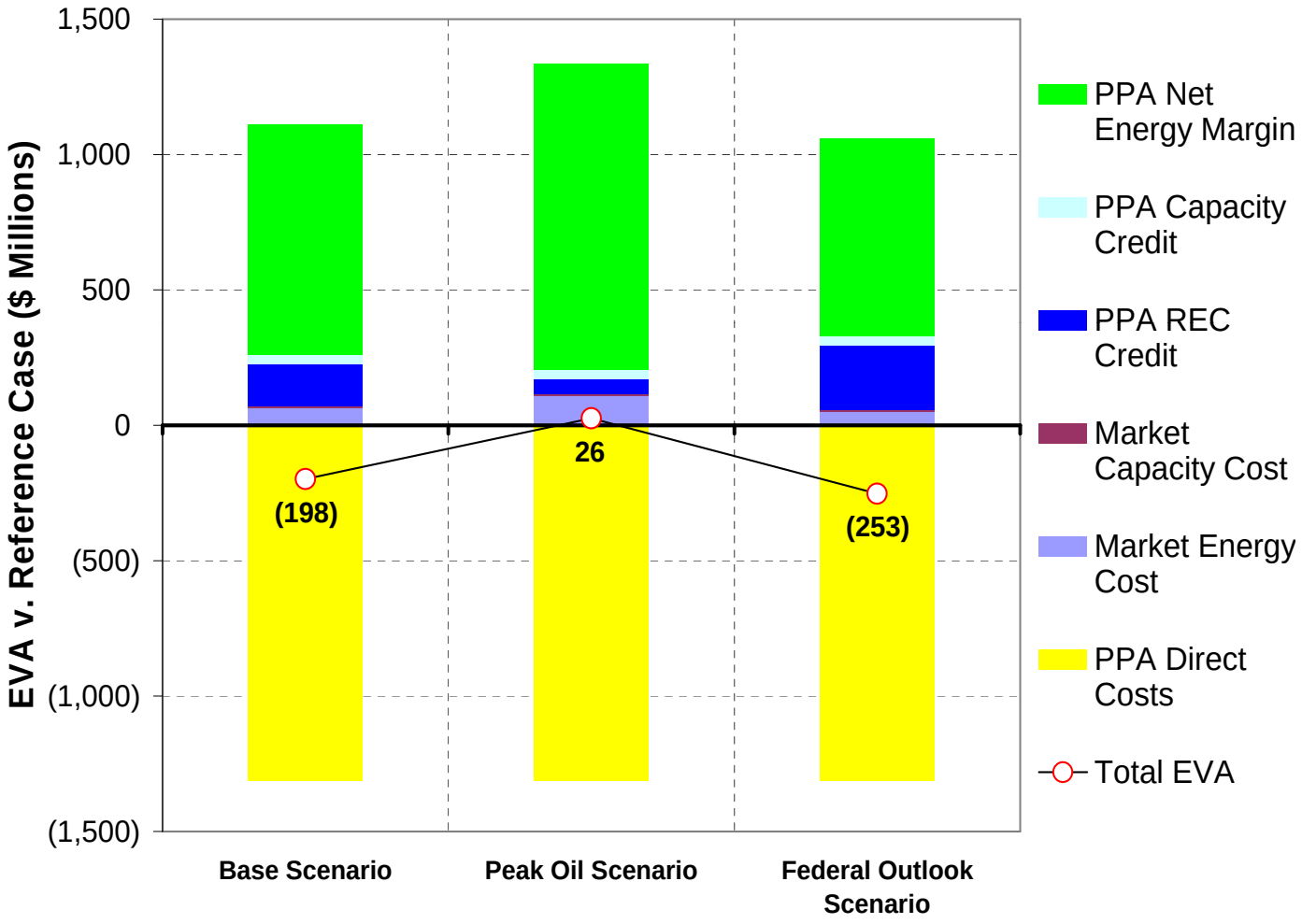
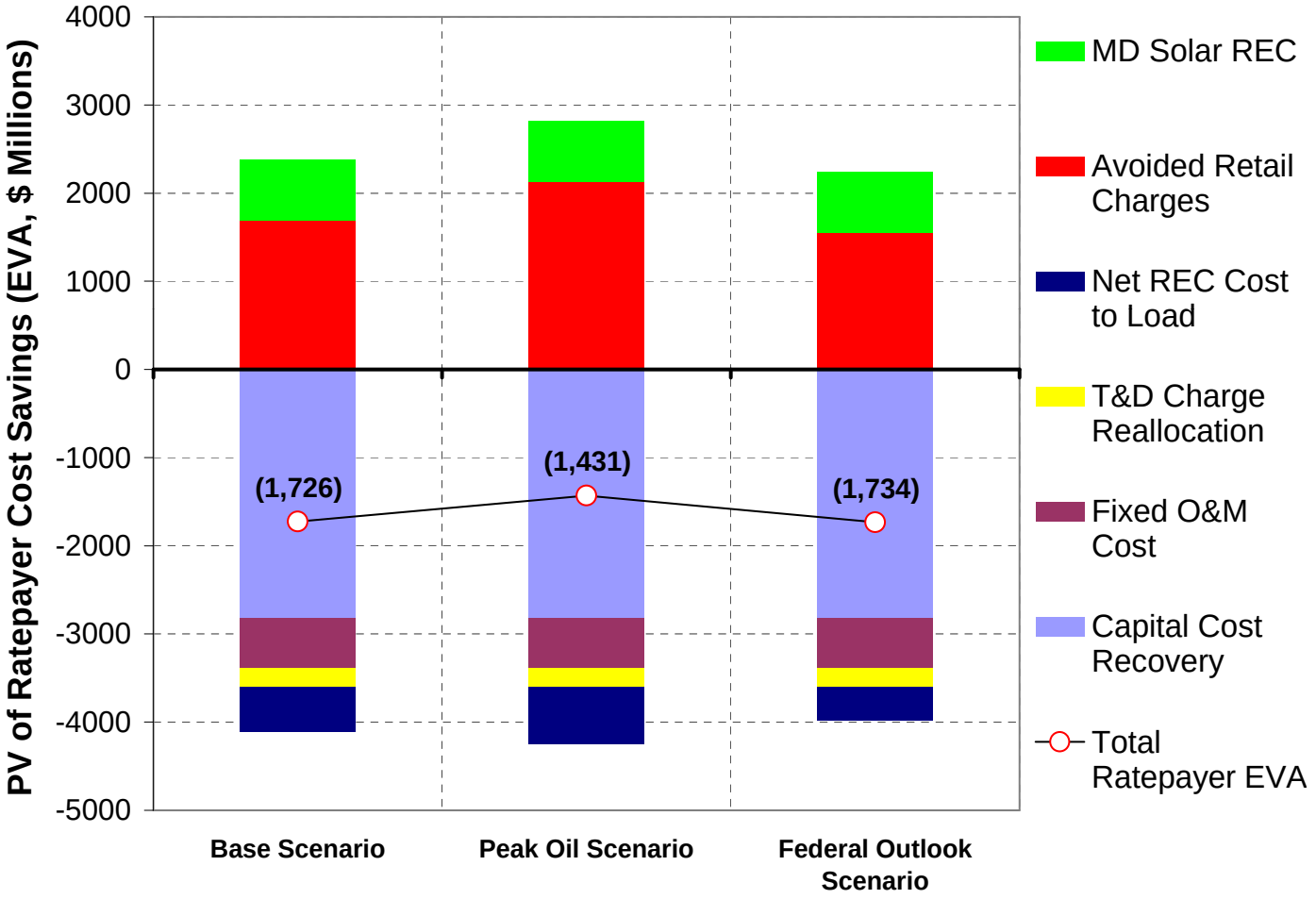


Solar (2008 Levitan report)



For more information…

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