Maryland Energy
ADMINISTRATION

Powering Maryland's Future

EmPOWER and RPS Progress Update

May 21, 2015

Welcome!

- This presentation will walk through the progress through 2014 for EmPOWER and RPS
- Additional slides are in the Appendix for some background on these policies
- Happy to make this very interactive

Please note that MEA has not completed its feasibility review of meeting the current GGRA Plan 2020 projections for EmPOWER and RPS.

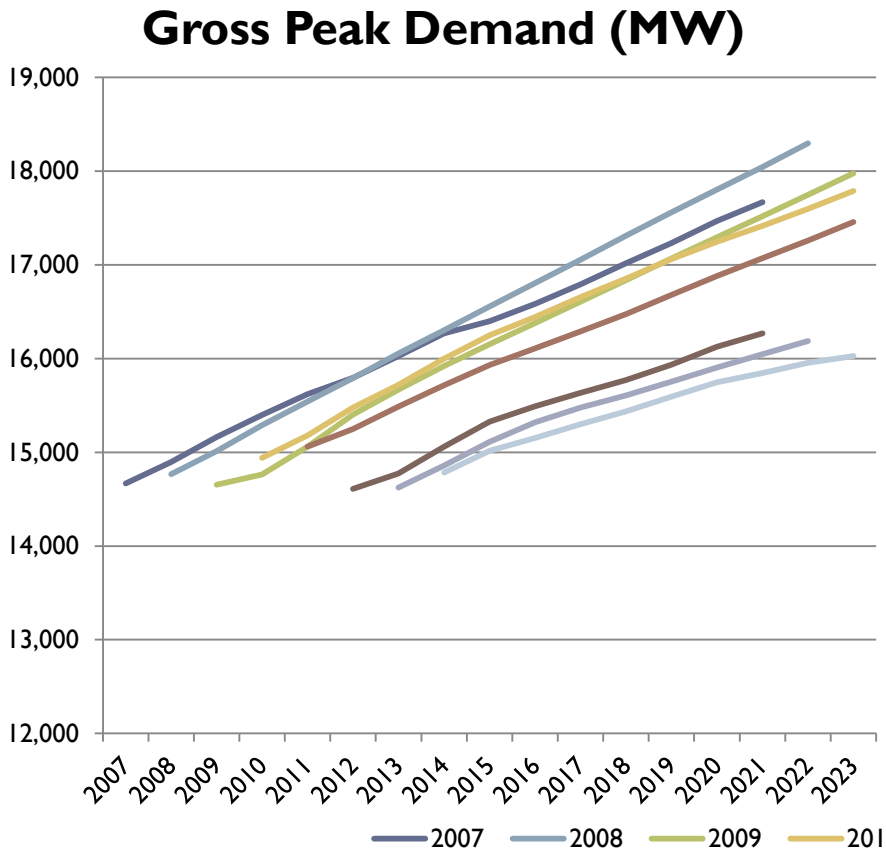
2020 GGRA Plan values in this presentation are therefor for reference only. Any updates will be provided to MDE by June 15, 2015.

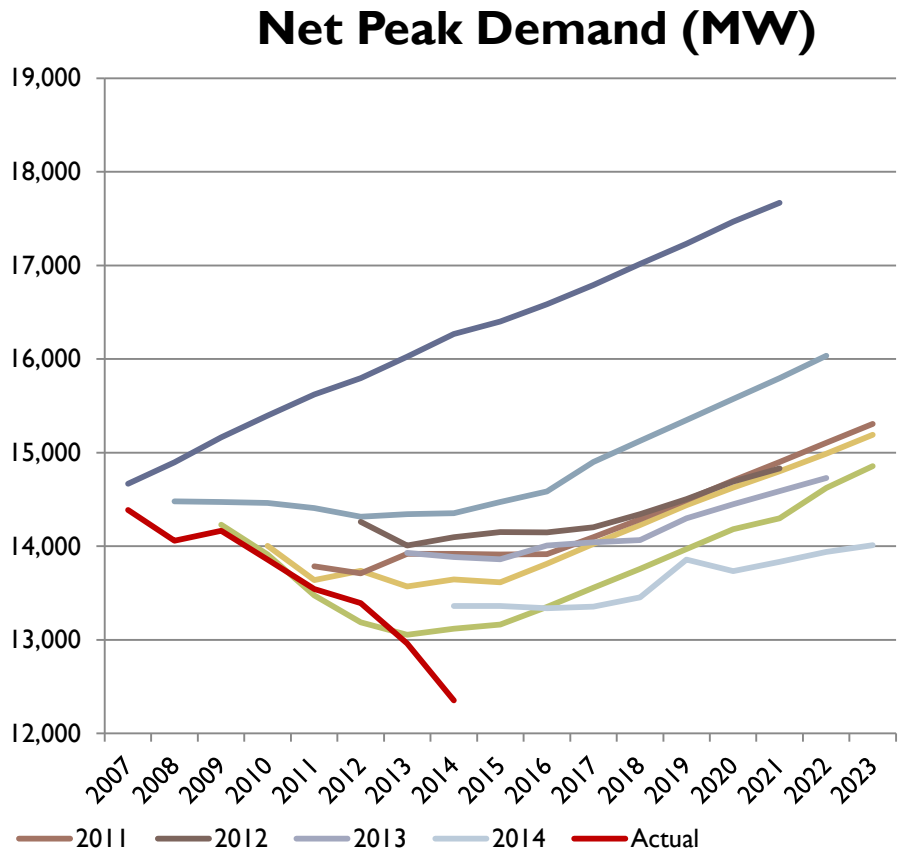
EmPOWER Maryland

- EmPOWER Maryland Act passed in 2008
- 15% per capita reduction in energy use and peak demand by 2015 from 2007 baseline
  - Utilities responsible for majority of energy use and all of peak demand savings
- Post-2015 goals are work in progress
  - 2015-2017 programs approved and being implemented
  - EmPOWER Planning Group coordinating potential study
  - PSC held hearings on post-2015 goal setting in February

Maryland Peak Demand

- Recession postponed gross demand forecast by 6-7 years, but all projections still up.





Listed year indicates version of PSC Ten Year Plan. Actual peak demand from PSC

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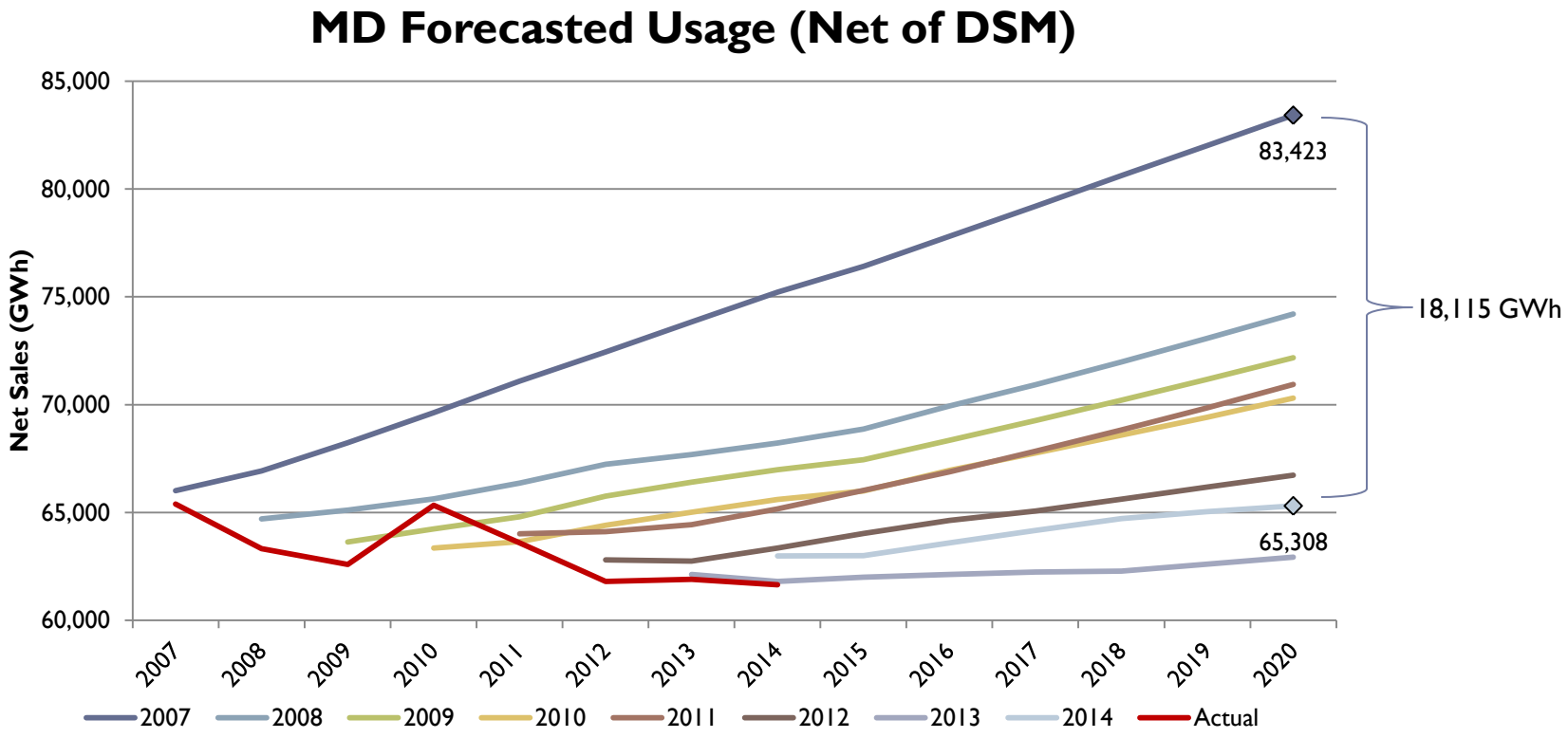
Maryland Energy Use

- Recession/EmPOWER flattened and lowered forecasts
  - Over 18,000 GWh by 2020 between 2007 and 2014 forecast*
  - 2015-2017 programs not fully incorporated into 2014 forecast



* Listed year indicates version of PSC Ten Year Plan. Actual sales from EIA

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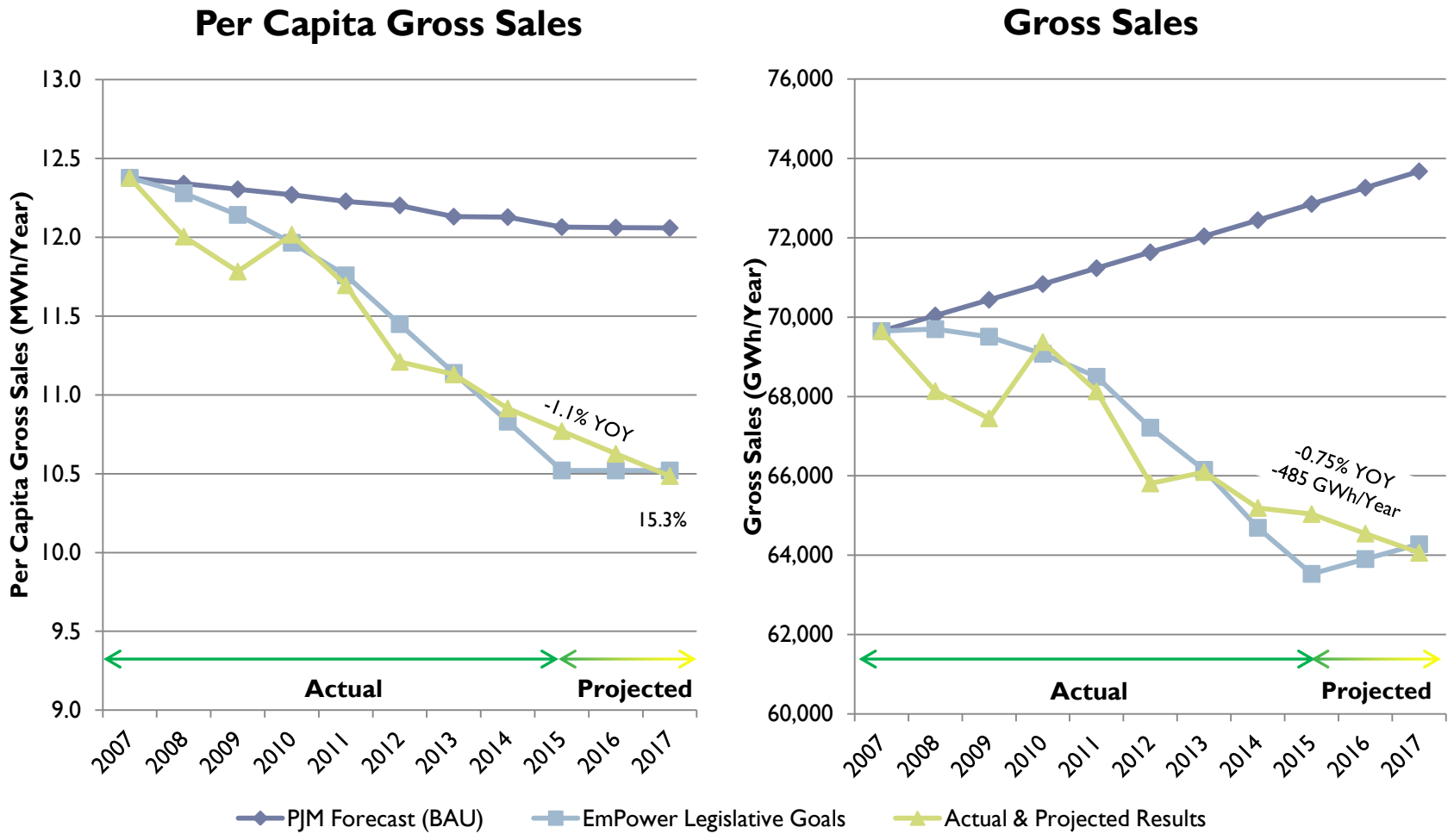
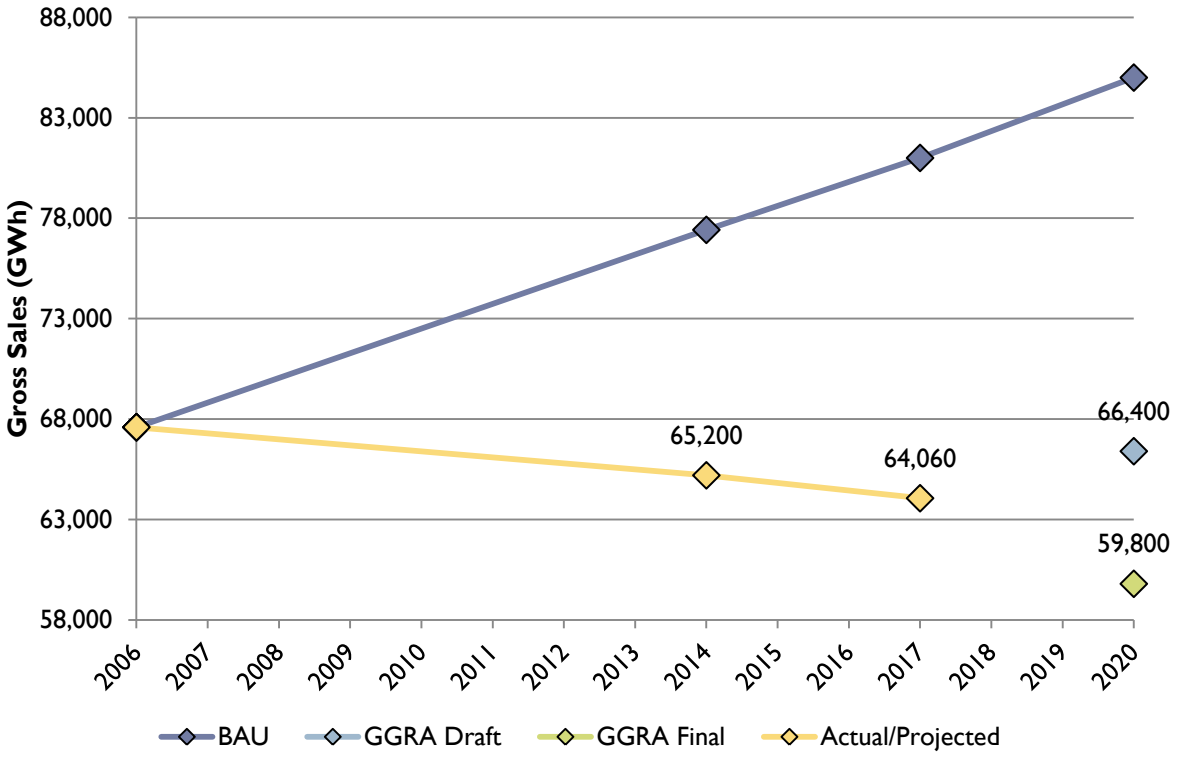
Projections with 2015-2017 Programs



GGRA Plan Projections – EmPOWER

Category	GGRA Draft	GGRA Final
2020 Sales (GWh)	66,400	59,800
Emissions Reductions (MMT)	8.42	10.52



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EmPOWER Maryland Challenges

- Program savings driven by utilities, subject to PSC budget approval
- Rate impact has increased over time
  - Increased costs are an area of concern for the Hogan administration and it supports efforts to reduce the overall rate impact of EmPOWER
  - Rate impacts and bill impacts are not the same issue and both need to be monitored closely
- Stricter federal standards erodes savings in cost effectiveness testing methodology
- Efficient Lighting (CFL/LED) saturation increasing
- Electrification of transportation may provide headwind
  - Although GHG savings offset in Transportation module, and effect likely small in the near term

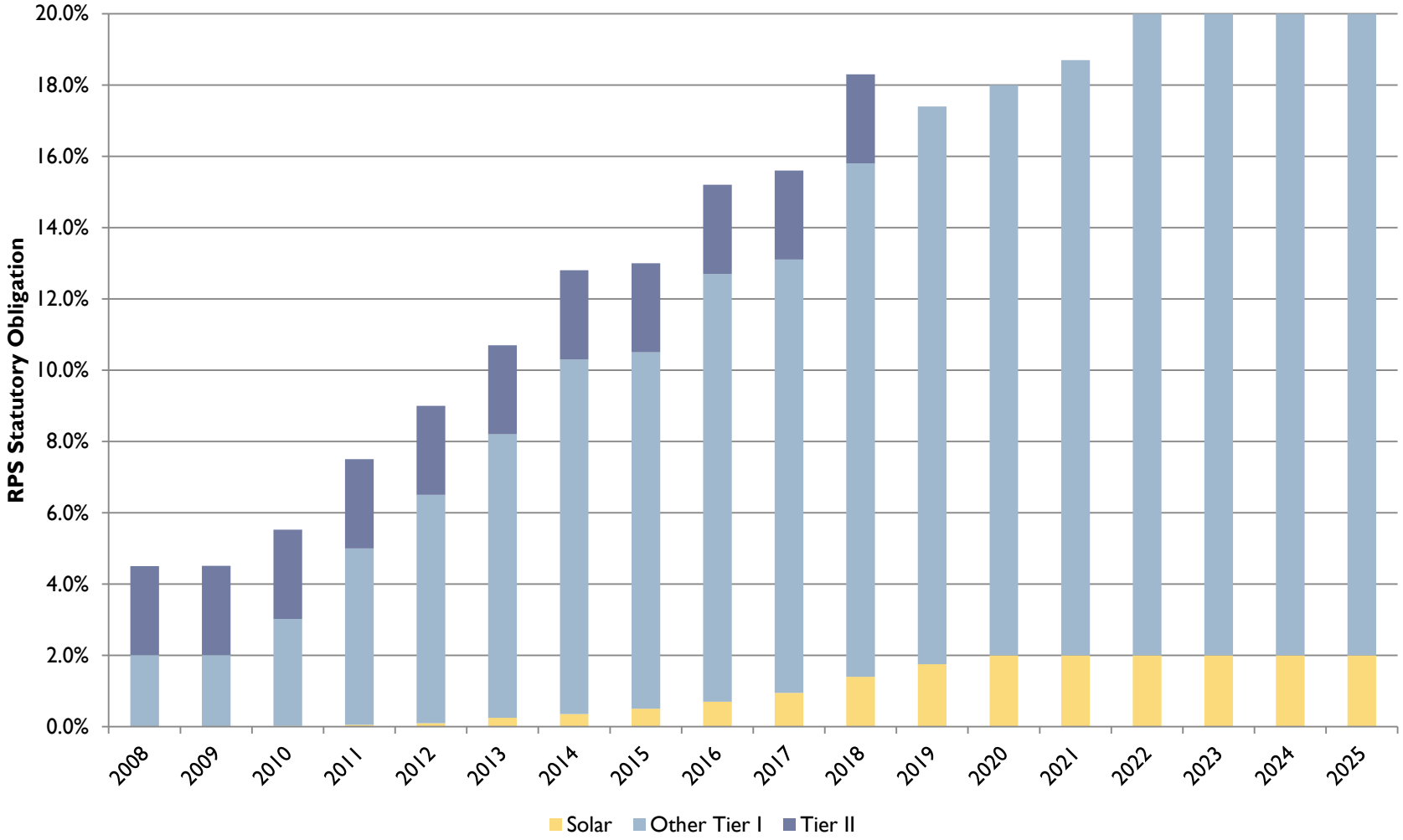
EmPOWER Maryland Opportunities

- C&I performance had been lagging, so still good opportunity for highly cost effective savings
- Pilot financing programs showing early promise
- Natural gas programs still in very early stages
- 2015-2017 programs still very highly cost effective
  - Delivering lifecycle savings at around 3.5-4.5 cents/kWh
  - TRC in the 1.7-1.9 range
- AMI will enable new, data-driven savings programs
  - Building analytics, new behavioral programs, etc.

Renewable Energy Portfolio Standard

- Maryland Renewable Energy Portfolio Standard (RPS) requires 20% of qualifying sales to be from renewable sources by 2022
  - 2% solar carve out by 2020, 2.5% Tier 2 sunsets in 2019
- "Renewable" sources are defined in statute
  - Solar, wind, geothermal, qualifying biomass, qualifying biogas, hydro, waste-to-energy, ocean, poultry litter-to-energy, refuse-derived fuel, thermal energy from thermal biomass system
- RECs from systems that are in or can deliver into PJM
  - Solar, WTE, RDF, PL, TEfTBS, geothermal HVAC must be "connected to distribution grid serving Maryland"

Statutory RPS Obligation



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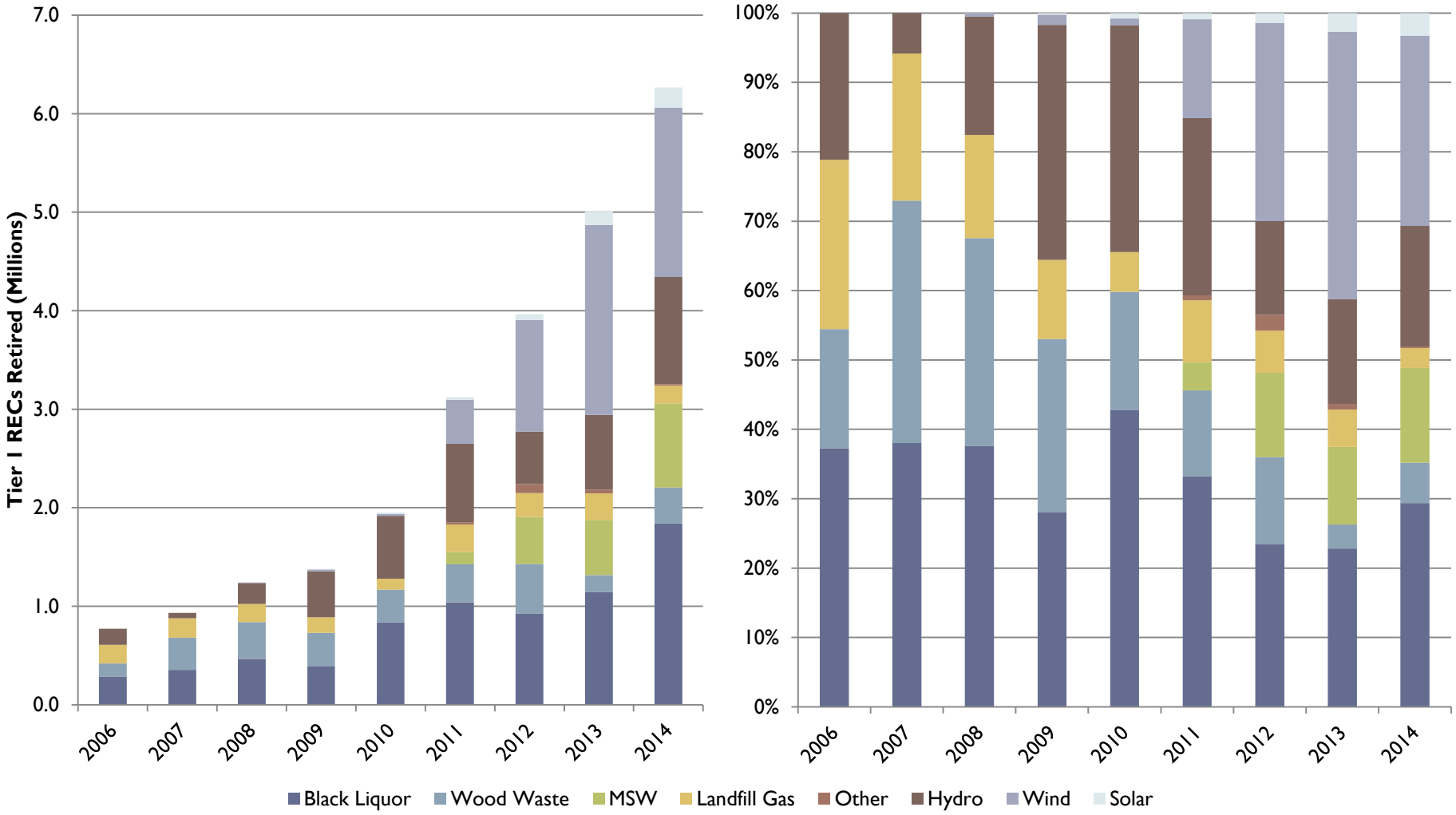
Historic Retirement of Tier 1 RECs



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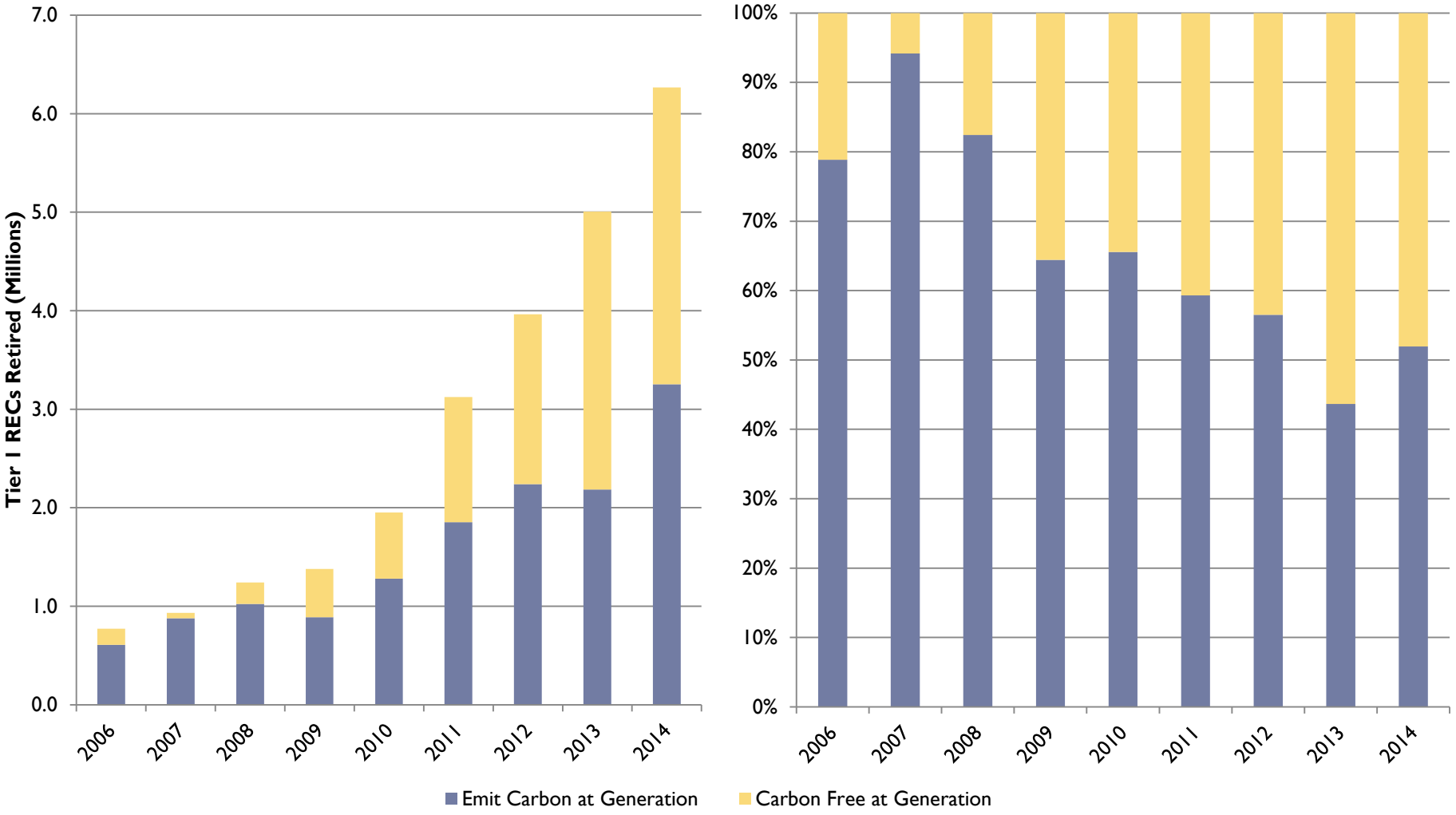

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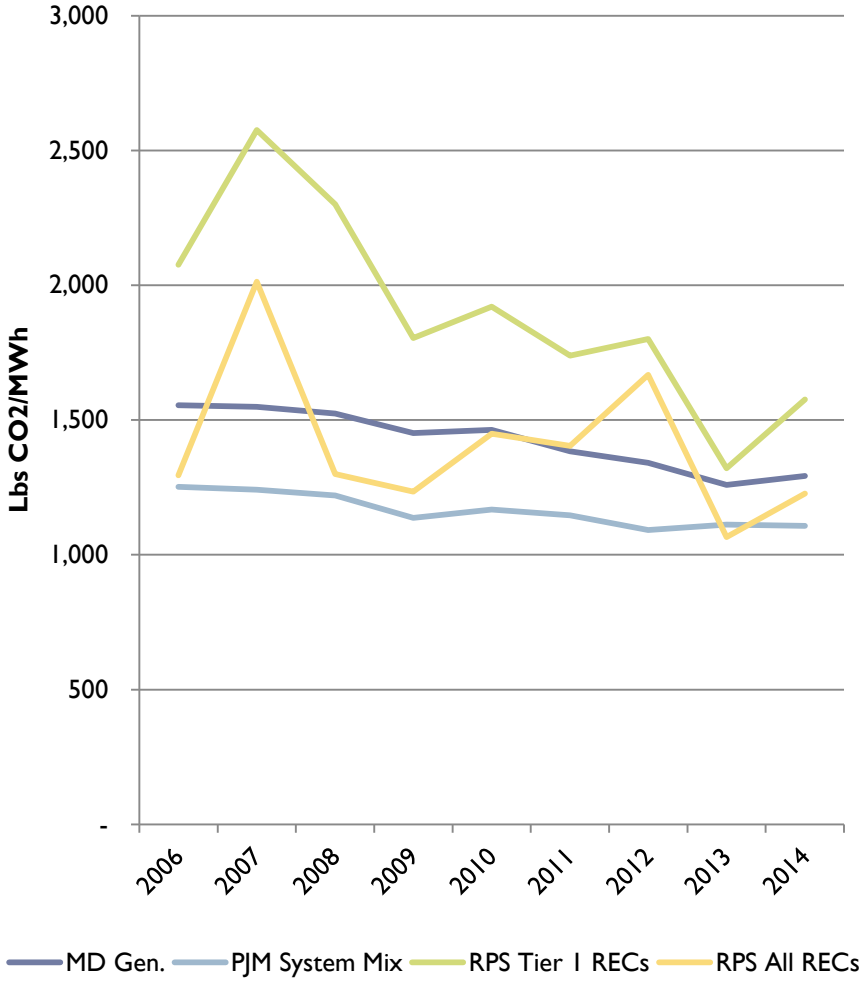
Carbon Intensity of Electricity Sources

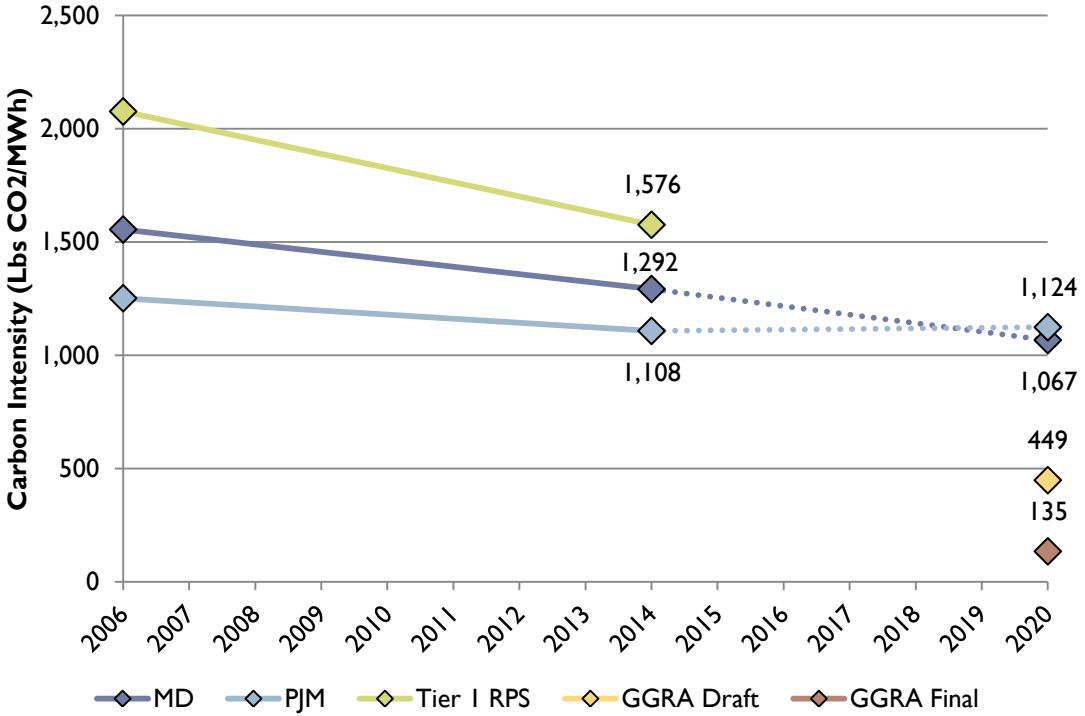
- MD has substantial coal generation, but market factors have affected how they are dispatched
- PJM intensity declined even as more coal-intense areas added (Ohio, KY)
- RPS calculation based on retired REC mix
  - Includes emissions for biomass/WTE



* MD Generation from EIA/EPA with WTE emissions added and does not reflect formal GGRA methodology. PJM and RPS from PJM-GATS with EPA emission factors and updated heat rates from prior analysis.

GGRA Plan Projections – RPS

Category	GGRA Draft	GGRA Final
RPS Percentage	20% by 2022	25% by 2020
Qualifying Biomass Allowed?	Yes	No
Emissions Reductions (MMT)	6.86	10.96



* 2020 GGRA projections for MD and PJM from EPA 111(d) Base Case analysis.
2020 RPS projection assumes wind is marginal resource for meeting expanding RPS.

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RPS Challenges

- Policy emission reductions a function of quantity (% of sales) and composition (carbon intensity of RECs)
  - Changes in either would require legislation
- EPA Biogenic Carbon Accounting Framework not finalized
  - Considerable debate amongst academics/policy makers how to treat biomass emissions
  - Not going to solve this today, but most agree that timescale of emission source/sink is critical
  - MDE has chosen to include biogenic emissions at point of consumption
- Expiration of federal PTC and reduction of ITC
- Integrating increasing penetration of solar

RPS Opportunities

- Calculation methodology could be updated to better reflect RECs rather than average MD/PJM intensity
- Wind and solar continue to come down in overall price
  - New turbine technology better suited to lower wind areas
  - Solar prices continue to fall at rapid pace
- Oversupply of PJM RECs being absorbed, so increase in RPS driving new projects and affecting CO2 intensity
- 111(d) likely to be additional driver of renewables

Questions?

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EmPOWER Reductions

- Reductions as calculated in 2012:
  - 2020 Reductions as Initially Designed: 8.42 $MMtCO_2e$
  - 2020 Reductions with Enhancements: 10.52 $MMtCO_2e$
- Reductions as calculated in 2015
  - 2014 Reductions as Initially Designed: 5.32 $MMtCO_2e$
  - 2014 Reductions with Enhancements: 5.32 $MMtCO_2e$
- Additional Statistics as of end of 2014
  - 4.4 million MWh of savings to date
  - 1,700 MW of demand reduction capability
  - Over 1.7 million measures for residential customers (excluding light bulbs)
  - 34 million efficient light bulbs rebated

RPS Reductions

- Reductions as calculated in 2012:
  - 2020 Reductions as Initially Designed: 6.86 $MMtCO_2e$
  - 2020 Reductions with Enhancements: 10.96 $MMtCO_2e$
- Reductions as calculated in 2015
  - 2014 Reductions as Initially Designed: 0.69 $MMtCO_2e$*
  - 2014 Reductions with Enhancements: 0.69 $MMtCO_2e$
- Additional Statistics as of end of 2014
  - 7.8 million RECs retired (12.8% of sales)
  - 240 MW of solar in Maryland

* Includes Tier 2 benefit (large hydro) which is scheduled to sunset in 2019. Tier 1 benefit is 0.20 MMT