Achieving *Cost-Effective* Price-Responsive Demand in New England

Consumer Liaison Group

Henry Yoshimura, Director, Demand Resource Strategy
ISO New England

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ISO New England and New Demand Resource Opportunities

- On June 1, 2010, ISO New England implemented the Forward Capacity Market
  - Over 2,500 MW of demand resources participating
    - 2009 system peak was 25,100 MW;
    - 2010 projected system peak is 27,190 MW
  - New, state-of-the-art infrastructure developed to securely communicate dispatch instructions, and receive near real-time telemetry and revenue-quality meter data from active demand response capacity resources
    - Demand response dispatched where and when needed to improve system reliability and mitigate potential fatigue

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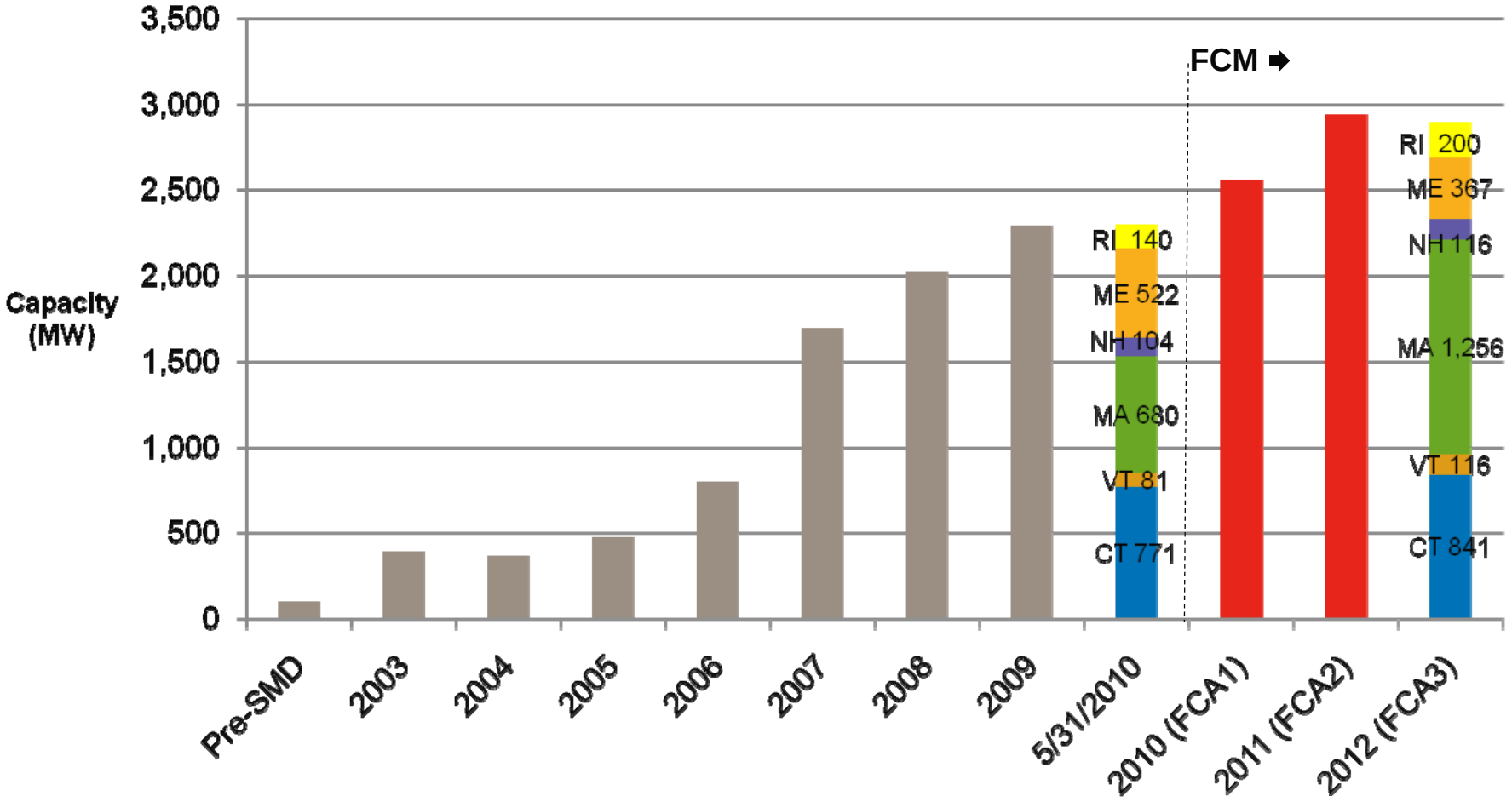
Demand Resources in New England

Forward Capacity Market Promotes Growth



Through 5/31/2010: Total DR Enrollment in ISO Programs

2010-2012: Total DR Cleared in FCM (New and Existing)

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New England is Committed to Efficient Demand Resource Implementation

- New England is a leader in demand resource implementation
  - New England states use economic tests to review and approve utility demand resource programs
- Utility spending on DR must be “cost-effective”
  - A program is cost-effective when it is the “least-cost” approach to meeting consumer demand – i.e., program cost is less than the “avoided cost” of producing energy (DR cost < energy savings)
- Least-cost approaches can result in higher rates, which may be acceptable if the program decreases customer bills on average over time

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ISO New England is Committed to Efficient Demand Resource Implementation

- The goal of the markets administered by the ISO is to meet consumer demand using the least-cost resources available in each moment of time

- Payment of the full Locational Marginal Price ("LMP") for reduced energy consumption will result in ***higher-cost*** resources being used to meet consumer demand
  - Assume that the retail rate is $80/MWh and the LMP is $90/MWh
    - LMP = the real-time marginal cost of wholesale electrical energy
  - A $150/MWh demand resource could be used to reduce the customer's net energy bill by $20/MWh
    - ($80 bill savings + $90 full LMP payment - $150 demand resource cost = $20 net gain)

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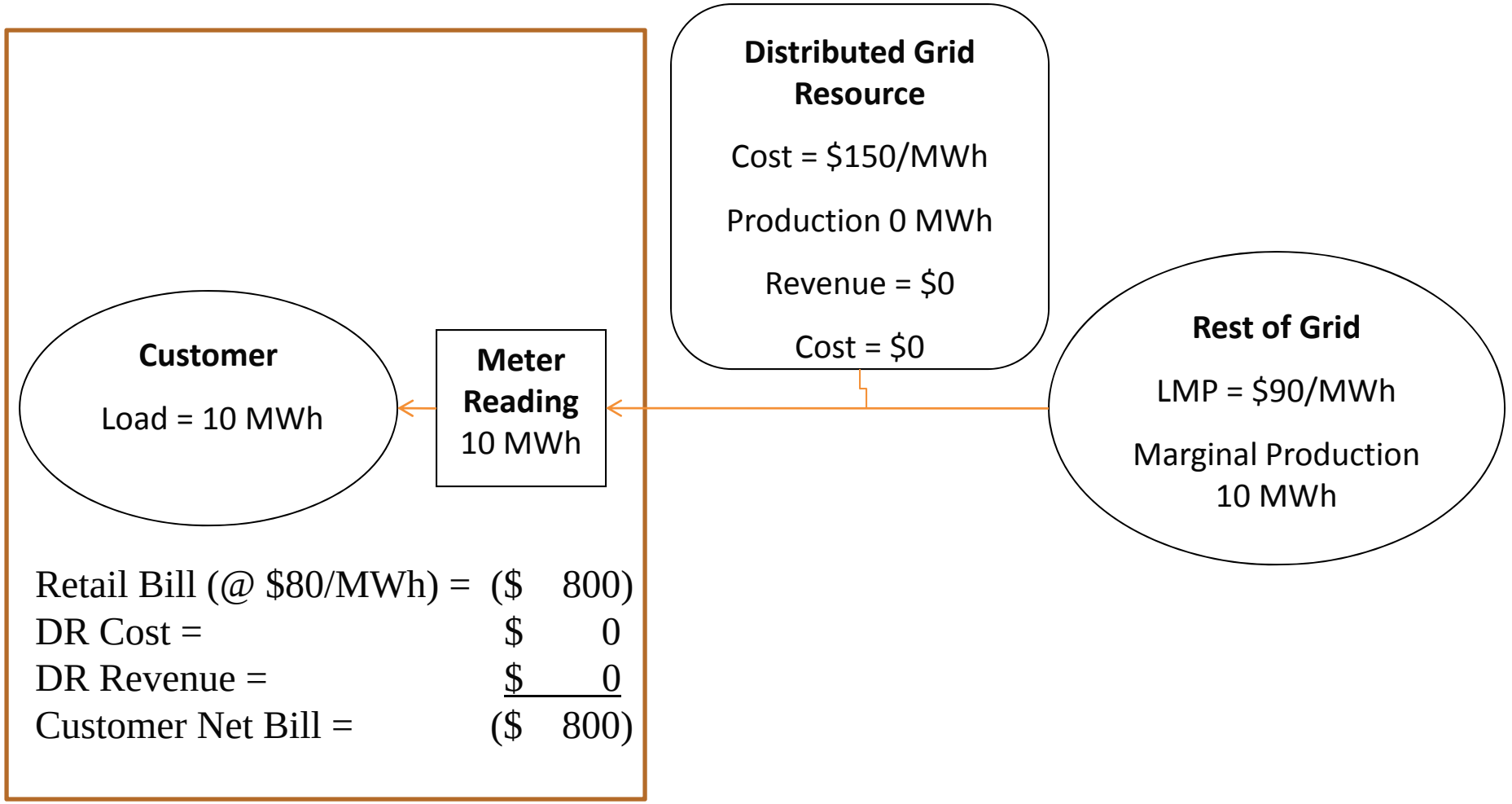
Least-Cost Dispatch of Energy Resources



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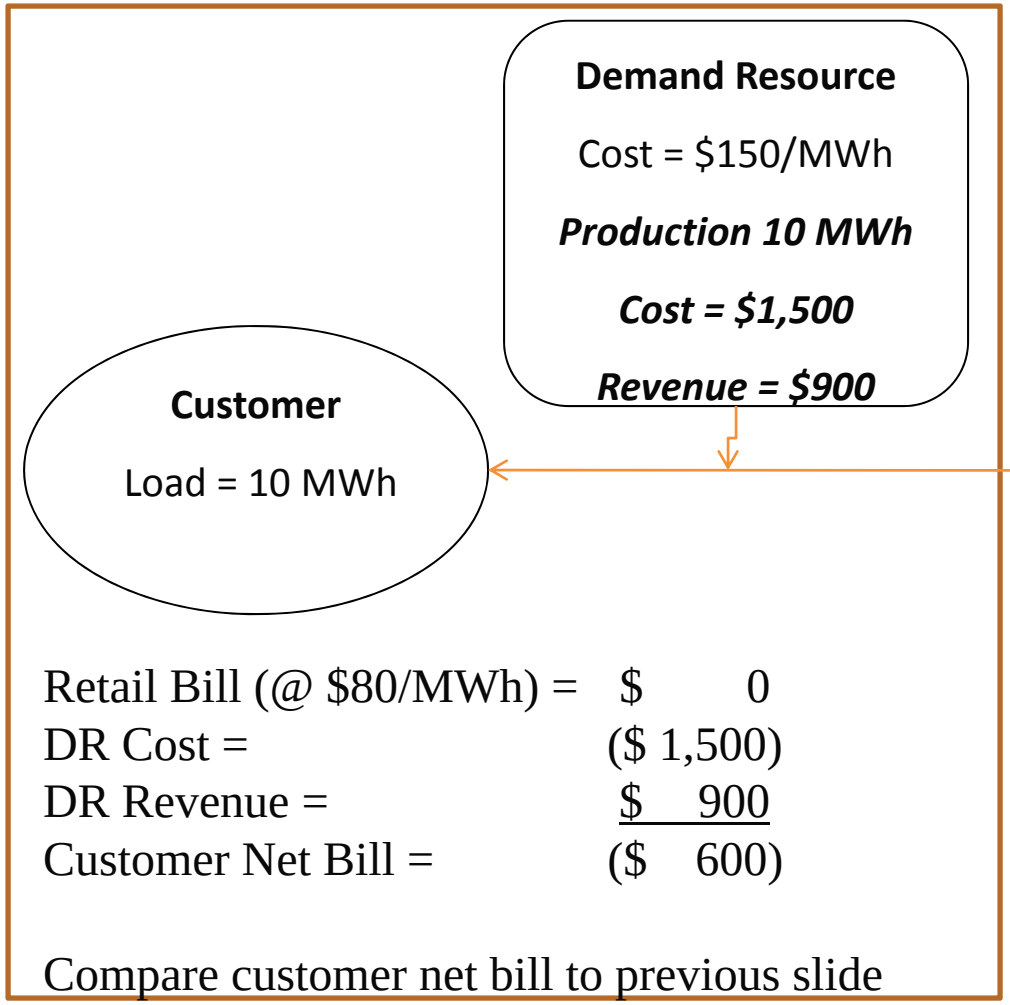
Impact of Full-LMP Payment for DR



Retail Bill (@ $80/MWh) =	$ 0
DR Cost =	($ 1,500)
DR Revenue =	$ 900
Customer Net Bill =	($ 600)

Compare customer net bill to previous slide

- Full LMP payment results in higher total resource costs as customers use demand resources to reduce their net electricity bill
- Behind-the-meter resources are given a competitive advantage over lower-cost, in-front of meter resources

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Demand Resources in the Energy Market

- A full LMP incentive payment results in a more expensive $150/MWh resource being used when a less expensive $90/MWh resource was available – ***not cost effective***
- Charges to other customers need to be increased to finance the $90/MWh incentive payment
  - How should these increased costs be allocated to customers?
- Under certain market conditions, short-run LMPs may be decreased as a result of lower demand
- As suppliers respond to short-run conditions, wholesale prices rise resulting in higher long-run customer bills
- A more efficient approach would be to implement dynamic retail rates

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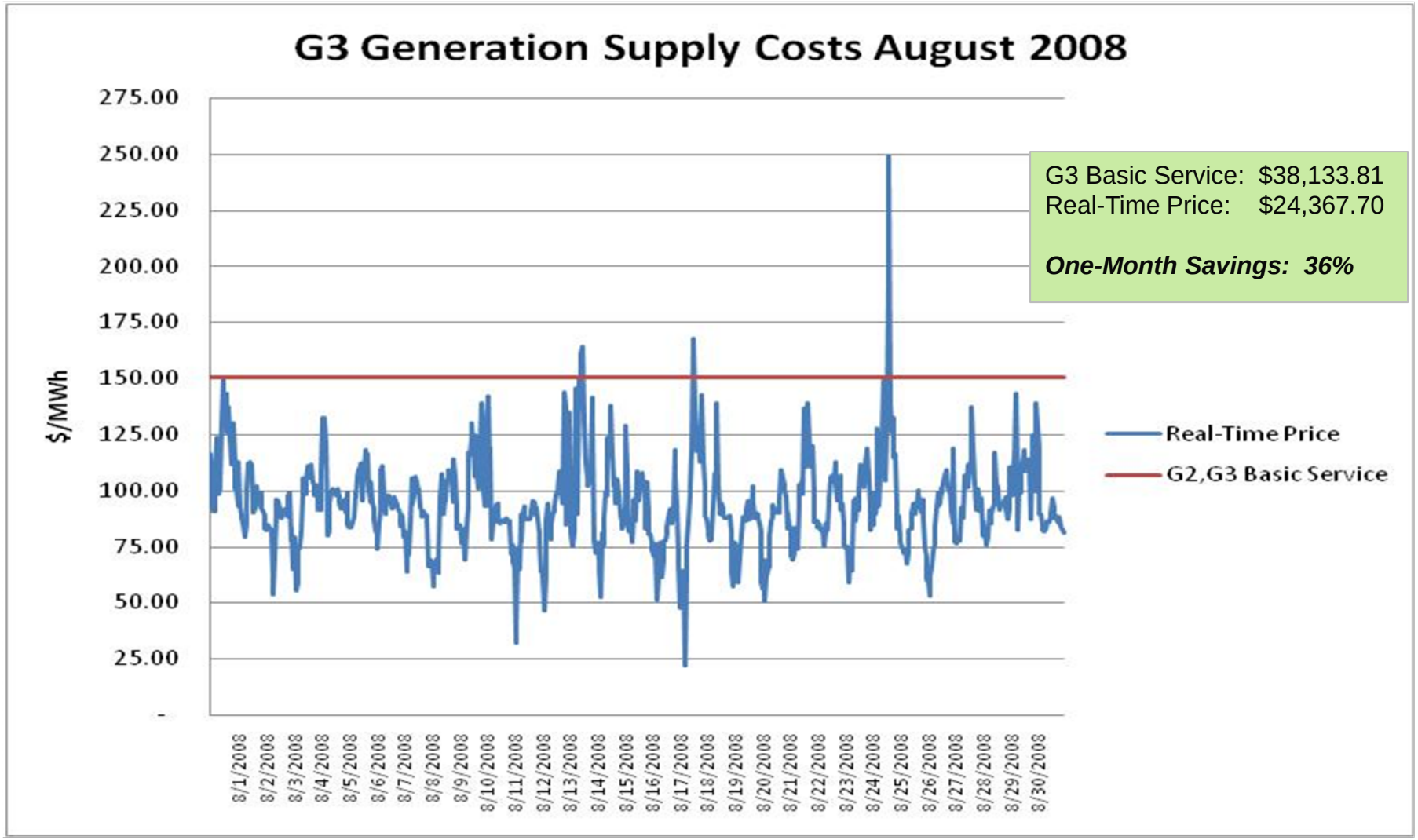
Smarter Grid Allows Customers to Use Energy More Wisely While Saving Money



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Customer Savings Under Real-Time Prices Exceed Full-LMP Payment

Comparison of Typical Customer Bills Under National Grid Basic Service and Real-Time Price (NEMA Load Zone) -- January 1, 2005 to December 31, 2009

Rate Class	Basic Service	Real-Time Price ("RTP")	Savings	RTP with Price Response	Savings	Basic Service With Full LMP Payment for Price Response	Savings
R1	$ 4,043	$ 3,533	13%	$ 3,284	19%	$ 3,678	9%
G1	$ 8,190	$ 7,247	12%	$ 6,742	18%	$ 7,455	9%
G2	$ 124,378	$ 106,217	15%	$ 98,871	21%	$ 113,330	9%
G3	$ 1,370,674	$ 1,140,709	17%	$ 1,064,680	22%	$ 1,255,703	8%

Note: This comparison includes generation commodity only – state-regulated wires charges (i.e., T&D costs) are not included

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Future of DR is Customer Response to Prices

- Customer response to time-varying wholesale prices is needed
  - Creates the lowest average retail prices and customer bills over time
  - Resolves cost allocation issues
  - Promotes customer choice
  - Eliminates customer baseline estimation problems
  - Stimulates investment in cost-effective load-shifting technologies (e.g., energy storage, plug-in electric vehicles)
  - Improves economic efficiency
- Barriers must be overcome
  - Advanced metering infrastructure
  - Smart retail pricing
  - Enabling technology

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