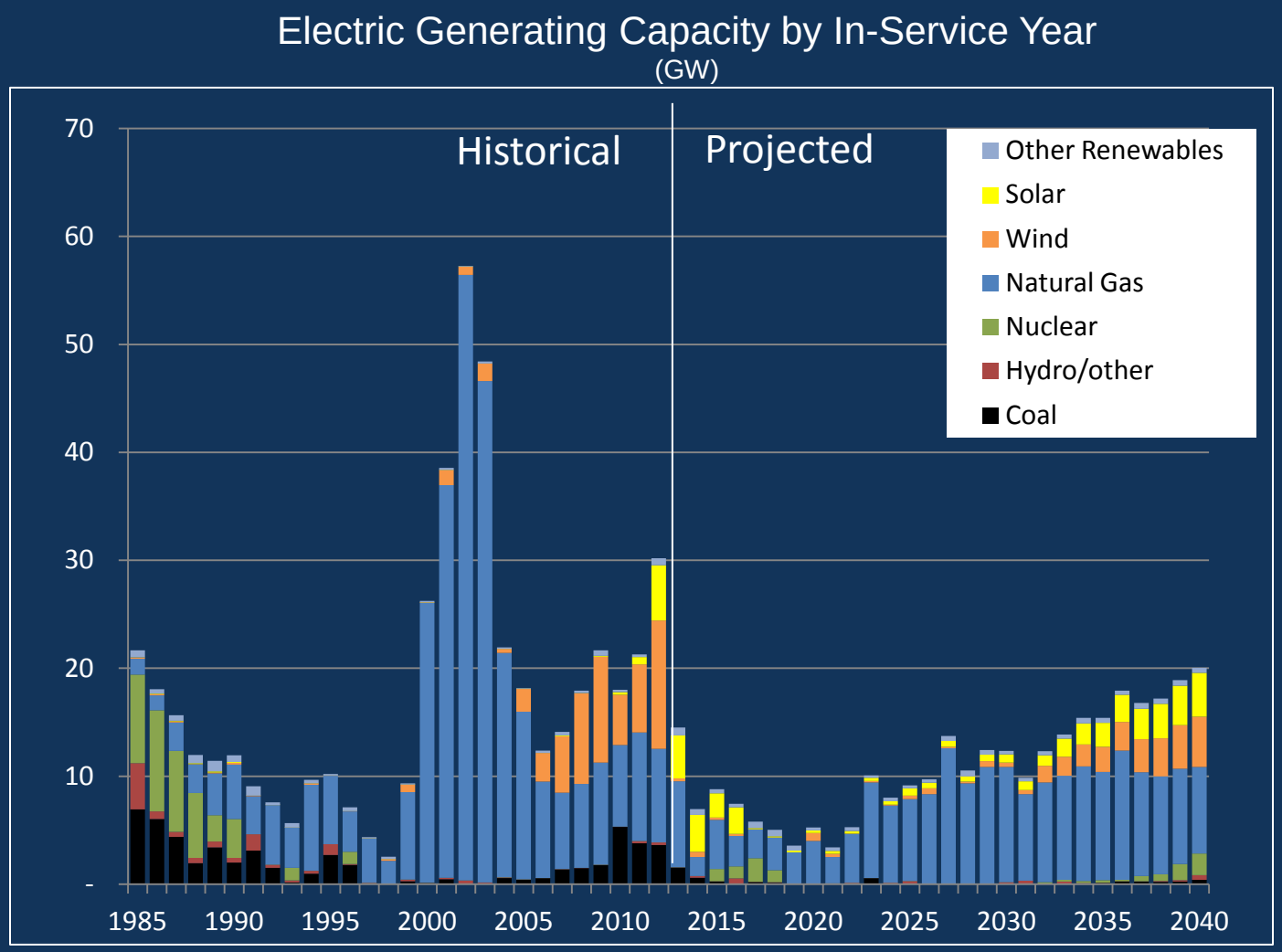
Natural Gas Generation

Technology for flexibility and reliability

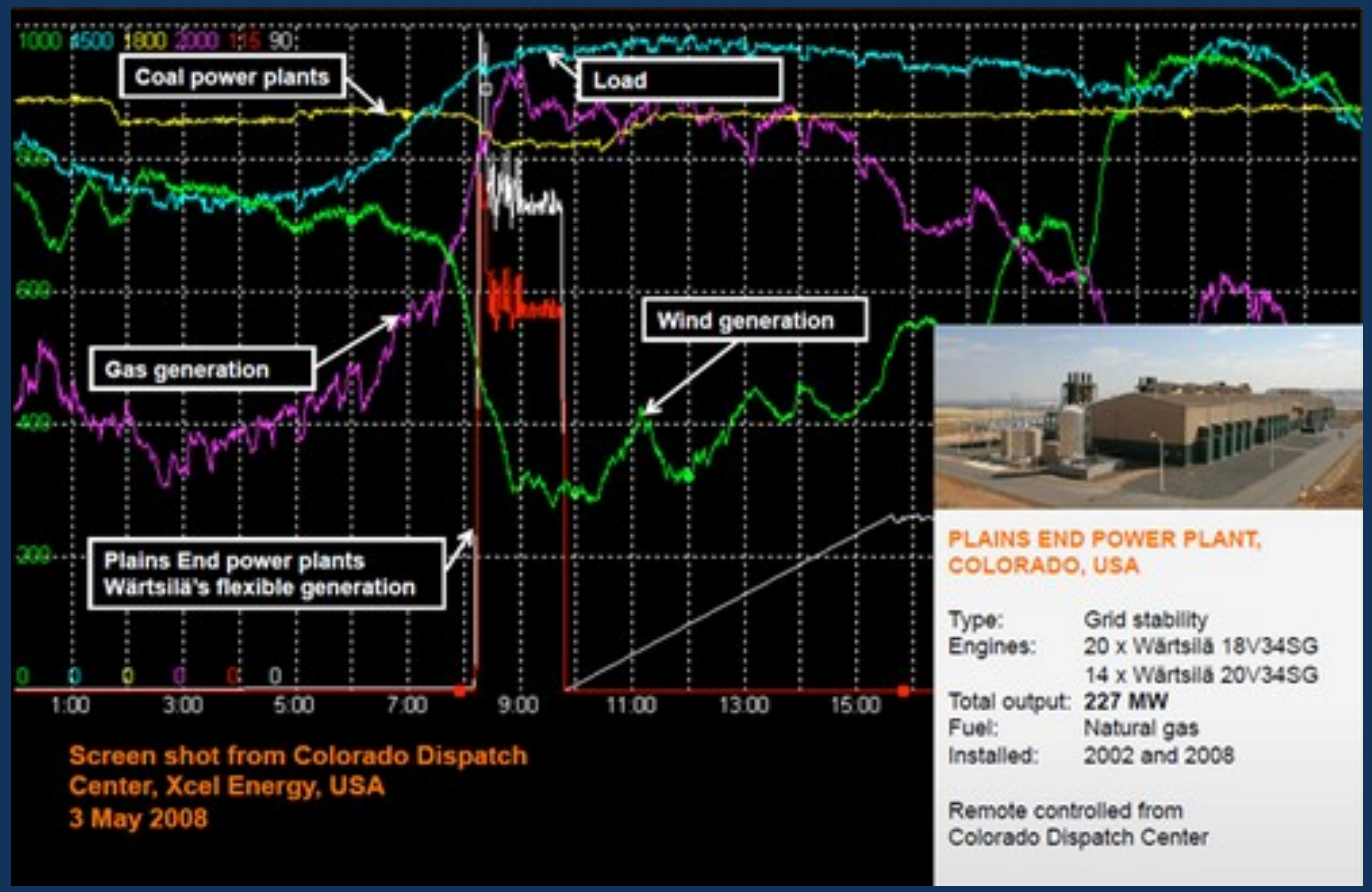
Amy Farrell
Vice President, Market Development
America’s Natural Gas Alliance

U.S. Generating Capacity



Source: EIA 2013

Natural Gas Solutions for Variable Generation



- Proven and cost-effective natural gas turbine and gas engine generation options available to provide fast start-up and ramping capability to ensure stable electric grid operations, complementing intermittent wind or solar generation

Flexible, fast-ramp-rate gas turbines

GE's FlexEfficieny™ Portfolio, 7F-5 Series

11 minutes to baseload power, 40 MW/min ramp rate

Natural Gas Distributed Generation and CHP

Gas Engines

Gas Turbines

Microturbines

- Efficient combined heat and power (CHP) systems lower energy costs, reduce CO_2 emissions, and reduce burden on electric delivery systems
- Gas engines perform efficiently for low load requirements; provide flexible configuration options
- Microturbines provide backup power and distributed generation for critical loads, and can serve CHP applications

Trillion BTUs	Total Gas Use for CHP by Sector	Total Natural Gas Use by Sector	% of Sector Total Use
Utility/IPP	733	9,144	8.0%
Industrial	1,179	6,899	17.1%
Commercial	114	2,905	3.9%
Residential	0	4,177	0.0%
Totals	**2,026**	**23,125**	**8.8%**

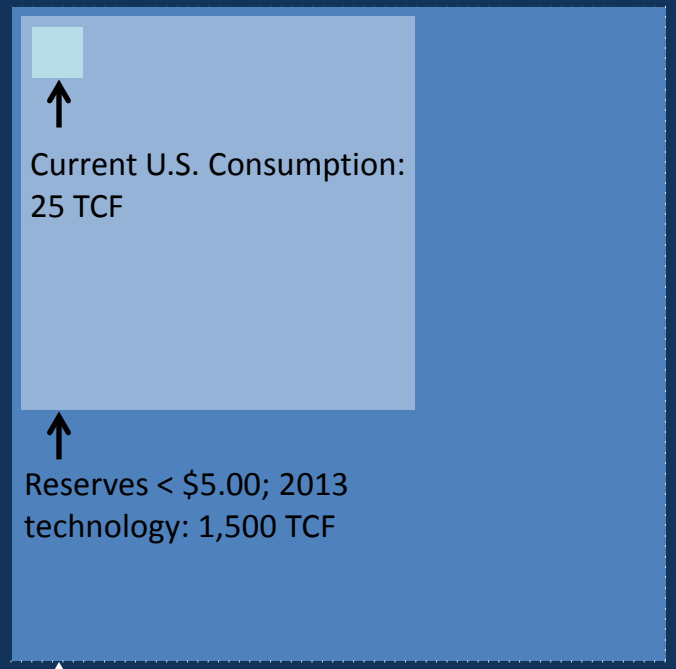
Based on 2012 DOE EIA data

Need for Market Adaptability

- FERC Order 755: Pay for performance – payment for how fast and how much the resource regulated versus capacity payments
- Flexible ramping products: Incentivize ramping capability in system operations (energy and ancillary markets)

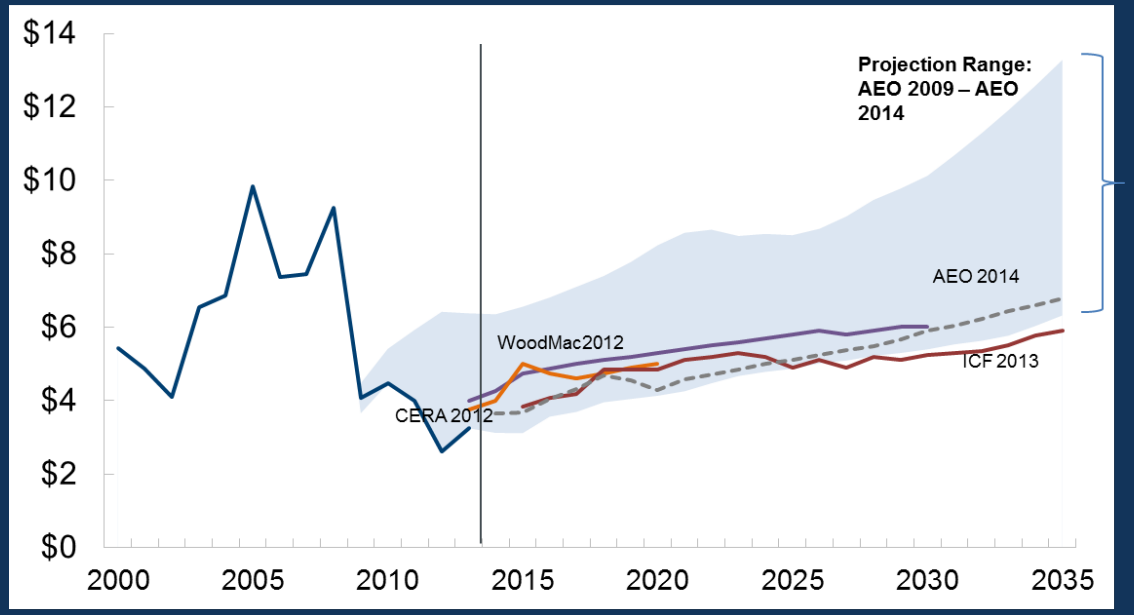
Supply and Affordability

U.S. & Canadian Reserves



Henry Hub Spot Natural Gas Price

(2011$/MMBtu)



Source: EIA Annual Energy Outlook: 2009, 2010, 2011, 2012, 2013, 2014
Henry Hub Spot prices (Actual prices: 2000 to 2012)

Reliable Delivery

Storage Location

Coal Supply

Rail System

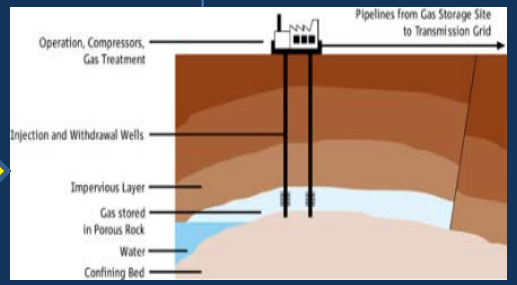
Coal-Fired Power Plant

Natural Gas Supply

Firm Transportation and Storage/Flexible Services

Natural Gas-Fired Power Plant

Storage Location
(Depleted Reservoir,
Salt Cavern, Aquifer)



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America's
Natural Gas
Alliance

www.anga.us
twitter @ANGAus

Amy Farrell
Vice President, Market Development
afarrell@anga.us