

energybiz
Leadership Forum

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Today's Topic

The Power Renaissance

What's happening at ground zero?

Who is AMP-Ohio?

- **American Municipal Power-Ohio is the wholesale power supplier and services provider for municipal electric systems in 6 states**
 - **Member-owned/governed non-profit corporation formed in 1971**
 - **Owns/operates smaller electric generating facilities (fossil, hydro, wind, distributed generation)**
 - **Develops, manages and coordinates wholesale power supply and interconnection agreements for members**
 - **126 Members in Ohio, Pennsylvania, Michigan, Virginia, West Virginia, Kentucky**
 - **Members serve more than 570,000 customers/meters**
 - **Members in footprints of both MISO and PJM transmission organizations**

Who is AMP-Ohio?

- Members serve approximately 542,000 customers/meters in six state footprint
- Board consists of member community city managers, public service and utility directors
- Members in footprints of both MISO and PJM transmission organizations
- Active member of the American Public Power Association (APPA)

AMP-Ohio's Power Supply Profile

- Generation mix of primarily coal (66%) and renewables (34%)
 - Doesn't include market purchases
- Peak load of 3,000 MW
- AMP-Ohio currently relies on the market for approximately:
 - 62% of baseload needs
 - 95% of intermediate needs
 - 20% peaking needs

Wholesale Prices Rising

- **Decreasing supply**
 - Little incentive to build new generation
- **Increasing demand**
- **Higher fuel costs**
- **Increasing environmental costs**
- **Increasing construction costs**
- **Impending carbon regulation**
- **Dysfunctional wholesale markets**

Wholesale Prices Rising

Utilities, especially transmission dependent utilities will have to be increasingly creative and strategic in terms of power supply



Increasing demand for renewable generation

- RPS/AEPS legislation passed in many states and under consideration in Congress will put additional pressure on utilities
- Need to be prepared for coming carbon regulatory regime
- Need to balance portfolios while controlling costs for end-use customers
- Interconnection and siting issues related to renewable generation projects need to be addressed

Current economy is having an impact

- Cost to end-use customers a big factor, especially in terms of industrial and commercial customers
- Current conditions are impacting the ability to finance generation projects
- Softening of the commodities markets may actually help in terms of controlling the cost of projects
- Stimulus money may help get some projects off the ground
 - Will depend on program structure

Climate Change Considerations

- Policy decision that will have a profound impact on our nation's economy
- Disproportionate regional impacts depending on program structure
- Need for regulatory certainty – but careful, thoughtful policy making
- Need for consumers to understand economic implications

Climate Change Considerations

- A cap-and-trade regime must:
 - Allow for broad availability of GHG offsets for projects that achieve emission reductions
 - Be the product of Congressional action
 - Achieve the goals established by Congress with the least possible economic impact on energy consumers
 - Be designed from the outset to slow, stop then reverse GHG emissions over a reasonable period of time

Climate Change Considerations

- A cap-and-trade regime must:
 - Be realistic about the status of technology development
 - Minimize initial auction amount to no more than 5% of total allowances to allow time for markets to develop and protect consumers
 - Include allocation of a substantial amount of allowances without cost to entities with emission-related compliance obligations
 - Provide adequate protection from market manipulation

What primary risks do we face going forward?

- How to balance our members future electricity needs with realities of:
 - A carbon-constrained economy
 - Increasing-cost industry
 - Organized markets
- In our case, this balance must be achieved from a starting point of being asset poor

Utilities must manage and plan

Consistent application of
sustainability as a business
practice

How should one define “sustainability”?

- *Corporate sustainability for AMP-Ohio is a “business approach that creates long-term member value by embracing opportunities and managing risks derived from economic, environmental, and social developments*

What steps have we embarked upon to implement our sustainability strategy?

- R.W. Beck developed an optimized supply resource plan for each member covering a 20-year period
- Model assumed an impact from CO2 regulation
- Identified a need for 2000+MW additional base load capacity by 2012-2013
- Self-build judged best option
- Aggressively developing our own assets
 - Modern coal facilities – 1,368 MW new generation
 - More than 300MW of new run-of-the-river hydro
 - Reviewing feasibility of approximately 100MW new wind and landfill gas
 - Considering new solar

What steps have we embarked upon to implement our sustainability strategy?

- Considering financial hedges to offset risk of carbon exposure
- Trading carbon allowances on the Chicago Climate Exchange
- A member of the Midwest Regional Carbon Sequestration Partnership
- Pursuing a portfolio of carbon offset projects (agricultural)

What steps have we embarked upon to implement our sustainability strategy?

Pursuing energy efficiency



Why Energy Efficiency?

- Helps meet the continued growth in electricity demand – whether from rising population or the increased use of electronic products
- Helps a utility manage increasing energy costs and exposure to volatile wholesale energy markets
- Reduces the impact of electricity generation on the environment and demonstrates stewardship
- Improves a utility's ability to economically respond to climate change

Why Energy Efficiency?

- Provides customers with tools to control and lower their bills via reduced consumption
- Societal and political leaders are looking to EE as critical component of future energy policy
- Is viewed favorably by customers, policymakers and Wall Street

Why Energy Efficiency?

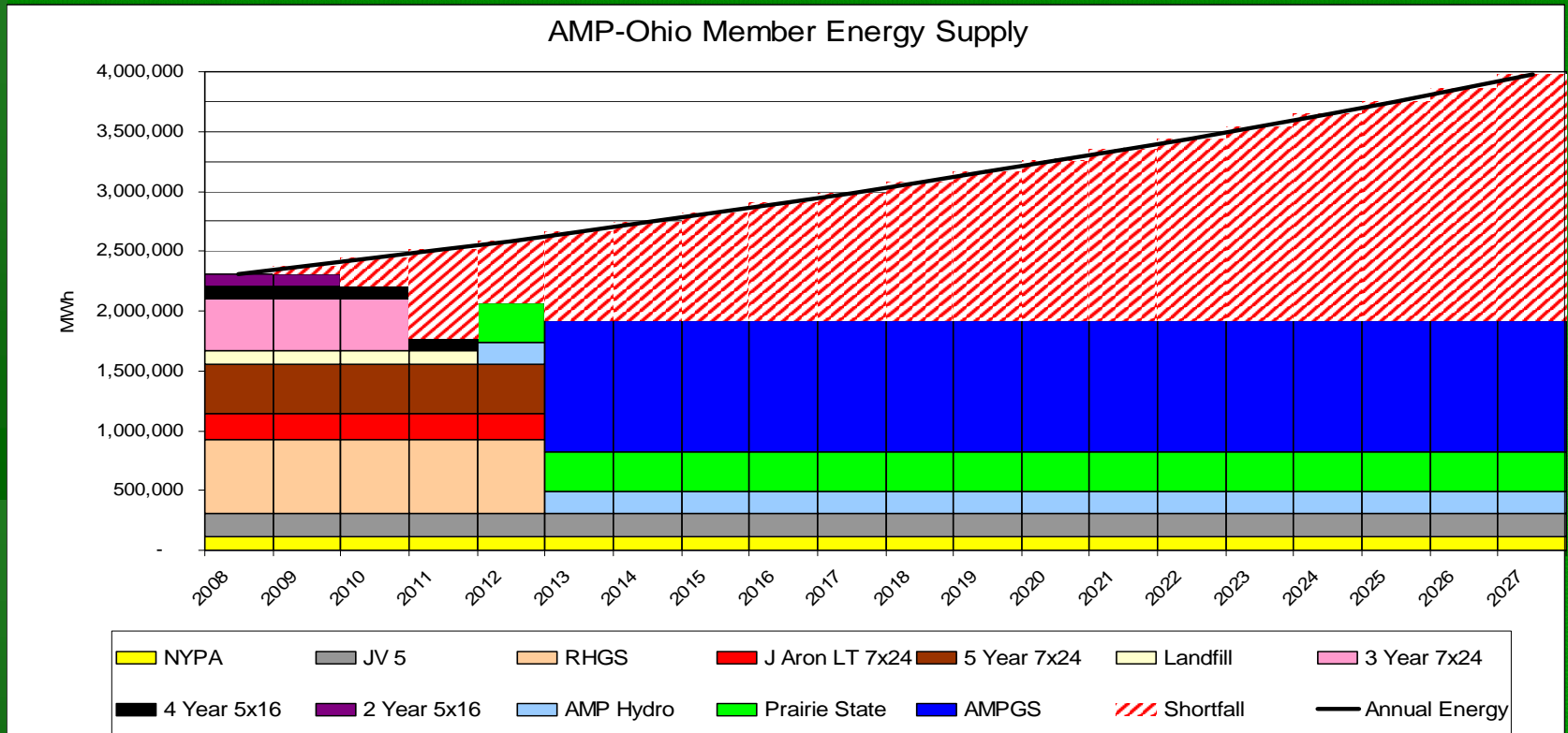
- Can provide both capacity and energy savings
 - For example, verifiable EE savings may receive capacity credits in PJM's RPM market in the future
- Energy efficiency is no longer viewed as a social program, but as a resource to be incorporated into utility planning
 - Cheaper to save some kWh than to produce them

What Energy Efficiency Has Achieved Elsewhere

Jurisdiction	Efficiency \$/yr	Spending as % of Revenue	Energy Savings/Yr	Savings as % of Sales (MWh Sales)
PG&E	\$220 million	2.78%	1,166 GWh/yr	1.6% (73 million)
Massachusetts	\$123 million	2.38%	455 GWh/yr	1.1% (41.4 million)
Connecticut	\$80 million	2.02%	318 GWh/yr	0.98% (32.4 million)
Vermont (Projected)	\$31 million	5.07%	124 GWh/yr	2.25% (5.5 million)

Levelized cost ranges from \$0.027 per kWh (PG&E) to \$0.039 per kWh (MA). Figures based on 2004-2006 experiences. *Source: VEIC*

AMP-Ohio and EE – Room in Portfolio



AMP-Ohio and EE

- In August 2007, the AMP-Ohio Board approved retaining the Vermont Energy Investment Corporation (VEIC) to aid in the analysis and design of an energy efficiency program for AMP-Ohio's membership
- In February 2008, the AMP-Ohio Board approved pursuing an energy efficiency program designed to place AMP-Ohio in the top-tier nationally in terms of energy savings
- To be a national leader, AMP-Ohio would seek to achieve a goal of 1% annual energy savings for its members in the 2015-17 timeframe

AMP-Ohio and EE

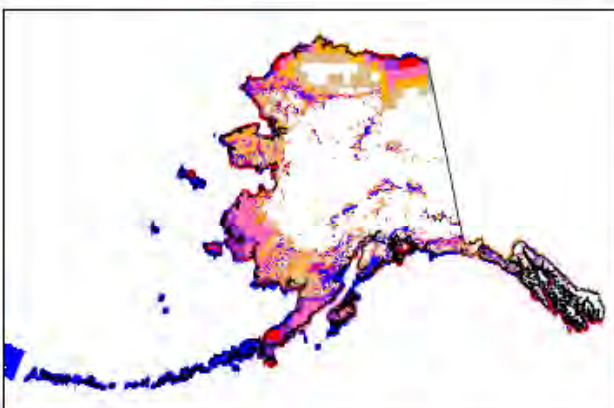
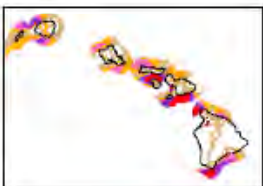
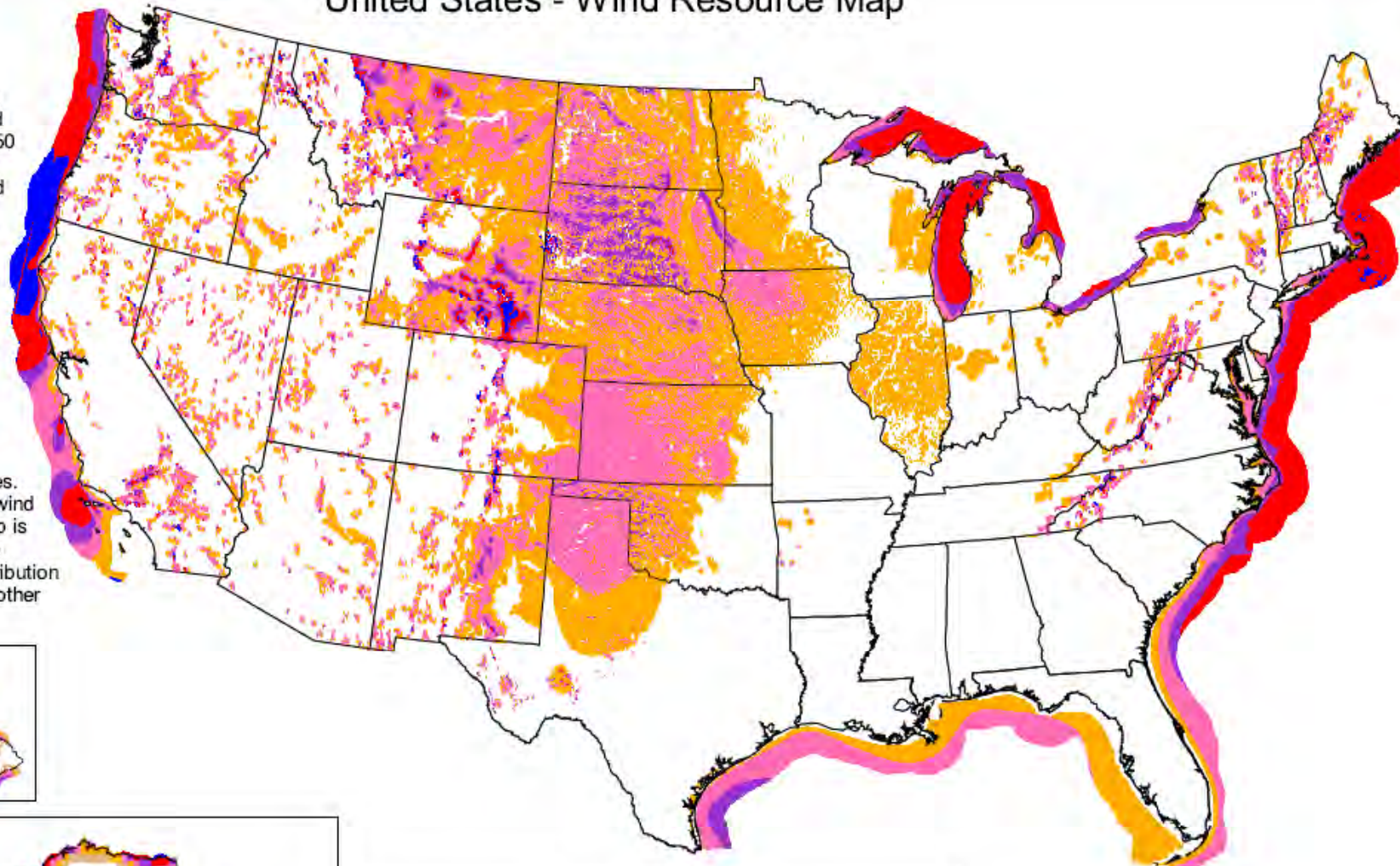
- Achieving a goal of 1% annual energy savings would mean AMP-Ohio's members' current energy growth rate would be cut in half (on average)
- Accumulated energy savings would be approximately 6.3% of AMP-Ohio's forecasted member load through 2017
- Accumulated peak savings would total approximately 272 MW through 2017

Conclusions

- Industry has changed and utilities need new strategies
 - Must work harder and smarter
- Government can't stop at regulation; must be partners in finding solutions from both a financial and technology standpoint
 - Workable incentive programs
 - Research and development programs
 - Regionalization
 - Must set the blueprint
 - Must allow technology to catch up
 - Government must resolve business model
 - Transmission must be part of the solution
- Industry must continue to develop new generation technologies that lead to balanced portfolios that include state-of-the-art fossil fuel, a range of renewable technologies and energy efficiency, cannot anoint one technology as the answer

United States - Wind Resource Map

This map shows the annual average wind power estimates at 50 meters above the surface of the United States. It is a combination of high resolution and low resolution datasets produced by NREL and other organizations. The data was screened to eliminate areas unlikely to be developed onshore due to land use or environmental issues. In many states, the wind resource on this map is visually enhanced to better show the distribution on ridge crests and other features.



Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m^2	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

^a Wind speeds are based on a Weibull k value of 2.0



U.S. Department of Energy
National Renewable Energy Laboratory

Public Power is positioned well

- Long-term business plan
- Conservative
- Innovative
- Customer-focused