

Electricity Markets: Trends and Challenges

A presentation by:

Dr. John A. Anderson, President & CEO
Electricity Consumers Resource Council (ELCON)
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Background

- ELCON is the national association of large industrial electricity consumers – founded in 1976 – many with significant facilities throughout the U.S.
 - Our members need a reliable supply of electricity – but at competitive prices
 - They operate in highly competitive markets both in the US as well as throughout the world
 - Electricity is a key input into the production of many of our members' products
 - Our members simply cannot pass along costs – electricity costs or any other costs
 - Their customers are not “captive” as are the ratepayers of traditional electric utilities
 - Rising electricity prices will result in the shifting of production to other facilities – either in the US or offshore – bringing with it a loss of local jobs



Issues I Plan To Address Today

- I begin with the standard caveat
 - These are my views – Not necessarily ELCON's
- Issues to address:
 1. Conditions in the electric industry today
 2. Current and Future Electricity Supplies
 3. Energy efficiency and renewable resources
 4. Smart Grid
 5. Finally, with the time left, I offer a few comments on climate change and the costs of meeting GHG emission requirements
- I conclude with a few thoughts on what the proposed policy changes mean for industrial consumers



Issue #1: Conditions in the Electric Industry Today

- Until recently, the Energy Information Administration (EIA) projected annual electricity demand to increase at least 30 percent by 2030
- However, the recession has had a very significant, and negative, impact on electricity sales
 - Both residential and industrial sales have fallen substantially
 - In fact, EEI recently reported that electricity sales fell more in 2009 than any time in the past 70 years – due primarily to reduced industrial consumption
 - This decline in sales has impacted utilities and their customers in a variety of ways



Issue #1: Conditions in the Electric Industry Today (Cont.)

- Will electricity sales rebound – soon?
 - We may – or may not – have reached the bottom of the current recession
 - A lot will depend on the recovery in confidence by American citizens
 - But, at present, the economy is in terrible shape
 - Basic manufacturing is in the worst shape in years
 - Unemployment is at historic highs
- This most certainly is not the time to layer additional costs on electricity consumers
 - Yet, the proposed policies discussed in this presentation each will result in substantial electricity cost increases

Issue #1: Conditions in the Electric Industry Today (Cont.)

- Will the U.S. Congress enact legislation that will slow recovery?
 - The current Administration certainly is a strong advocate of energy efficiency, renewable energy and climate change legislation
 - However, while it is certainly not a done deal, policies that could significantly slow the recovery in basic manufacturing may well be implemented
 - And it is questionable whether so-called “green jobs” will make up for the manufacturing losses
- More on this later

Issue #2: Current and Future Electricity Supplies

- Building any new power plant is very difficult
 - Nuclear is a long-term resource with no carbon risk and virtually no emissions, but is expensive to build, has a very long license period, has long-term waste and safety concerns
 - Coal is a relatively low-cost resource and the US has plenty of reserves, but there is a tremendous risk due to expected future carbon restrictions and other emission regulations and clean coal and carbon capture & storage technologies are not proven and may be years away from implementation
 - Natural gas is cleaner than coal and cheaper to build than either coal or nuclear, but more expensive to operate and has some carbon risk
- Given the difficulty with each, attention is often directed to energy efficiency and renewables – hopefully to avoid the need for new conventional generation
 - But neither energy efficiency nor renewables can, by themselves, solve the resource dilemma
 - And they probably will be expensive

Issue #2: Current and Future Electricity Supplies (Cont.)

- There may be some good news concerning natural gas
 - It appears that over 2,000 trillion cubic feet of untapped natural gas in shale reserves have recently been discovered
 - Natural gas generation produces much less carbon dioxide than burning other fossil fuels
 - If found to be economic, these natural gas supplies may be used to meet future environmental mandates in a far more economical manner than either conventional base load generation or renewables
- The recent fall in electricity demand thus gives us time to explore the natural gas opportunities
 - Rather than quickly mandating alternatives only to find them too expensive later

Issue #3(a): Energy Efficiency

- **RE: Energy Efficiency -- *Utilities* say:**
 - EE should be recognized as a high-priority resource
 - Many respected organizations suggest that EE can cut total energy consumption by perhaps as much as 1/3
 - Utilities can make long-term commitments to implement EE as a resource
 - Utilities can promote sufficient, timely and stable program funding to deliver EE where cost effective
 - However, today utilities have a financial disincentive to implement EE
 - Thus, utilities say that Commissions should modify policies to “align utility incentives with the delivery of EE” and modify ratemaking practices to promote EE investment
 - Utilities must receive adequate “incentives” to offset their business motivation to increase sales

Issue #3(a): Energy Efficiency (Cont.)

□ However, *ratepayers* say:

- **Cost effective** energy efficiency most certainly should be a high-priority resource
- It ***might*** be possible to motivate utilities to make investments to either sell or “unsell” electricity
 - Rate structures and cost recovery mechanisms maybe possible (but not likely) to make utilities financially indifferent to the two options
 - However, by far most of any utility’s gross revenues comes from selling
 - And this will continue as long as our economy remains electricity intensive and customers have relatively inelastic demands
 - So consumers ask: Will energy efficiency be cost effective with the expensive incentives necessary to overcome the core utility business model?

Issue #3(a): Energy Efficiency (Cont.)

- I emphasize – Industrials are very strong supporters of cost-effective energy efficiency
 - They have to be
 - World-wide competition requires them to implement cost-effective energy efficiency
 - Thus, much of the “low hanging fruit” for industrials has already been implemented
 - Further, since each manufacturing plant is unique, the opportunity for industrials to benefit from utility-implemented energy efficiency programs is limited

Issue #3(a): Energy Efficiency (Cont.)

- It is often asserted that utilities can serve as “banks” for energy efficiency
 - However, consumers question such a role
 - Are utilities better bankers than bankers?
 - Do commercial banks today refuse to fund truly cost effective EE?
- Alternatively, is the attraction to use utilities as the vehicle for EE
 - The ease at which money can be taken from captive ratepayers and used to finance investments that ratepayers otherwise think are uneconomic?
- A more basic question:
 - Are utilities and regulators in a better position to decide for consumers the amount of energy efficiency consumers really want?

Issue #3(a): Energy Efficiency (Cont.)

- **Revenue Decoupling** (RD) supposedly severs the “link” between a utility’s earnings and the volume of its sales
 - It is intended to eliminate a utility’s disincentive to implement energy efficiency and load reduction programs
- However, for reasons beyond the time I have today
 - ELCON is strongly opposed to RD
 - Although we are strong supporters of energy efficiency as I mentioned earlier
 - Our opposition is more specifically set forth in the ELCON White Paper on RD (available at: <http://www.elcon.org/Documents/Publications/3-1RevenueDecoupling.PDF>)
- Many consumer organizations representing both small and large consumers also are strongly opposed to RD



Issue #3(a): Energy Efficiency (Cont.)

- We oppose RD for at least the following reasons:
 - RD reduces the incentive for consumers to implement EE
 - RD promotes mediocrity in the management of utilities
 - RD increases ratepayers' rates (and probably bills), while creating only minimal and/or questionable net energy savings
 - RD shifts risk from shareholders to ratepayers with only dubious opportunities for net increases in consumer benefits
 - RD creates a basic conflict between the goals and motivations of utilities and the economic interests of a state
 - It eliminates any motivation for the utility to be concerned about the state's economic growth or condition
 - RD results in a complete lack of customer focus



Issue #3(b): Renewable Resources

- Renewable energy usually means wind and solar – but also tidal, geothermal, biomass, some hydro, etc.
 - Renewables may offer tremendous opportunities
 - DOE's National Renewable Energy Laboratory is studying scenarios of up to 80% of our nation's electricity supply to be supplied by renewables
 - And some states are establishing renewable mandates
 - Even though it is becoming apparent that some (many?) of the states can't meet the existing standards
- Bills in both the US House and Senate propose some form of mandatory renewable energy standard (RES)
 - These standards would require utilities to obtain a specified portion of their power from qualified sources such as wind, solar, geothermal, biomass, landfill gas, and certain hydropower

Issue #3(b): Renewable Resources (Cont.)

- U.S. House:
 - The American Clean Energy and Security Act (Waxman/Markey – ACES) was passed by the House in June 2009
 - ACES establishes a Renewable Electricity Standard (RES):
 - Utilities selling > 4 million MWh must obtain 15% from renewables and 5% energy efficiency by 2020
 - A Governor can change to 12% / 8%
 - Distributed generation such as rooftop solar “count” as 3 MW for each MW produced
 - Some (including some Democrats) say not only impracticable, but impossible
- U.S. Senate:
 - The Energy and Natural Resources Committee approved a 11% RES by 2021 with an additional 4% allowed to be met by EE



Issue #3(b): Renewable Resources (Cont.)

- Renewables have characteristics that are significantly different from more traditional generation
 - As an example, the North American Electric Reliability Corporation (NERC) states that wind is:
 - (1) variable, (2) uncertain and (3) often located in remote regions
 - Thus, it requires redundant back-up generation
 - Perhaps significant changes in operating procedures
 - And almost assuredly substantial new transmission

Issue #3(b): Renewable Resources (Cont.)

- Finally:
 - There is a growing argument between pro-wind regions (i.e., the midwest) and geographic areas that don't want to pay large amounts to bring the wind to their loads
 - And a growing tension between protecting the environment and the development of wind and solar power
- The bottom line: Some renewables can bring significant benefits – but can also bring substantial costs

Issue #4. Smart Grid

- We hear a lot about the need for a “smart grid” and the need for new or updated transmission assets
 - Smart grid will do for the electric industry what the internet did for communications
- However, there isn’t even an accepted definition of a smart grid
 - Will we get beta rather than VHS – or HD DVD rather than Blue Ray?
 - Will there be stranded costs?
- We do know that it will be very expensive – literally trillions of dollars – Who will pay?
 - Will it actually bring net benefits to consumers?
 - Advocates of a smart grid assert that it will bring more reliability “

Issue #4. Smart Grid (Cont.)

- A smart grid is being pushed very hard from the very highest policy levels in our country
 - President Obama has called for a smart grid on many occasions
 - DOE has recently granted \$3.4 billion in stimulus funds to smart grid projects in 49 states
- But what groups outside of the government, utilities and vendors are behind the effort?
 - I know of no consumer group that is in support
- The bottom line: A smart (or smarter) grid may bring great benefits, but at perhaps substantial cost
 - If the major consumer “benefit” is real time pricing, there could be substantial backlash
 - And there are significant cyber security concerns

Issue #5. Climate Change

- Several legislative proposals intended to reduce GHG emissions were considered in the U.S. Congress in 2009
 - **I emphasize: ELCON has no position on whether or not – or how – GHGs should be controlled**
 - But, if enacted, we would like to see any controls be as efficient as possible and harm manufacturers as little as possible
 - The cost implications are significant



Issue #5. Climate Change (Cont.)

- The House:
 - Approved H.R. 2454, The American Clean Energy and Security Act (ACES), on June 21, 2009 on a vote of 219 - 212
- H.R. 2454 would (among other things):
 - Require caps below 2005 emissions of CO₂:
 - 3% by 2012
 - 17% by 2020
 - 83% by 2050
 - Establish an RES of 20% by 2020 (as mentioned earlier)
 - It is important to note that adding an RES provision to a C & T scheme undermines the efficiency of C & T
 - Address “leakage” through the allocation of allowances to “trade vulnerable industries”
 - Establish a very detailed and complex “cap and trade” system of CO₂ allowances
 - With 85% of the allowances issued at no cost according to a very detailed formula in the early years

Issue #5: The Cost of Meeting GHG Controls

- The estimated costs of GHG controls vary substantially
 - An EPA study of the May 15th version of Waxman-Markey finds that
 - "...for the duration of the policy, average annual household consumption is estimated to decline in a range of \$98 to \$140 dollars per year relative to reference scenario."*
 - The version that actually passed the House would be even less expensive
 - Primarily because many allocations are given away without cost

EPA Preliminary Analysis of the Waxman-Markey Discussion Draft, The American Clean Energy and Security Act of 2009 in the 111th Congress, 4/20/09, slide #4, Emphasis Added.



Issue #5: The Cost of Meeting GHG Controls (Cont.)

- Further, McKinsey & Company found that:
 - We can achieve a 70% CO₂ reduction worldwide by 2030 at a cost of less than 1% of GDP with no lifestyle changes for anyone
 - However, achieving this result requires by 2030 (a few examples only):
 - 42 million hybrid vehicles – 40% of all sales
 - Avoiding deforestation of 170 million hectares
 - Planting 330 million hectares of new forests
 - 90% of all forestry opportunities are in developing countries
 - 70% of global electricity from low-carbon generation

Issue #5: The Cost of Meeting GHG Controls (Cont.)

- However, the Heritage Foundation released a study concluding that the latest version of Waxman-Markey would:
 - Reduce GDP by \$9.6 trillion
 - Destroy 1,105,000 jobs
 - Raise electricity rates 90% after adjusting for inflation
 - Raise gasoline prices by 74% after adjusting for inflation
 - Raise residential natural gas prices by 55%
 - Raise an average family's annual energy bill by \$1,500, and
 - Increase inflation-adjusted federal debt by 26% -- or \$29,150 per person

Issue #5: The Cost of Meeting GHG Controls (Cont.)

- And in late May, CRA International released a study conducted for the National Black Chamber of Commerce finding that the May 15th draft version of Waxman-Markey would, by 2030:
 - Reduce national GDP by roughly \$350 billion per year,
 - Cut net employment by 2.3 to 2.7 million jobs each year between 2012 and 2030, even after accounting for new “green” jobs,
 - Reduce earnings for the average U.S. worker by \$390 per year, and
 - Reduce an average household’s annual purchasing power by \$830 per year

Issue #5: The Cost of Meeting GHG Controls (Cont.)

- Finally, Steven Hayward of the American Enterprise Institute wrote an op-ed for the **WSJ** with a few thoughts that, if correct, put climate control costs into perspective including:
 - DOE says that in 2006 the US emitted 5.8 billion metric tons (bmt) of CO₂ or just under 20 tons per capita
 - An 80% reduction from 1990 levels means the US cannot emit more than 1 bmt of CO₂ in 2050
 - The last time the US emitted 1 bmt was around 1910 when the population was 92 million
 - By 2050, the Census Bureau projects population to be 420 million
 - Thus, per capita emissions must be 2.5 tons per capita
 - France and Switzerland (with electricity from nuclear and hydro respectively) emit about 6.5 tons per capita today
 - The average US residence uses about 10,500 kWh and emits 11.4 tons of CO₂ per year
 - This must fall to 2,500 kWh and 1.5 tons to meet the 2050 goal
- And climatologists estimate that meeting the cap will lower global temperatures by no more than 0.2 of a degree at the end of the century

Issue #5: What Is The Status Of GHG Legislation?

- A few “concerns” recently have been raised, perhaps slowing the movement including:
 - The data and document leaks at East Anglia in November 2009 questioning the science of climate change
 - Copenhagen – Signatories not meeting their commitments
 - Shale gas – An economical way to reduce GHG without legislation?
 - The IPCC’s admission in January 2010 that glacier melting predictions were not based on sound data
 - EPA regulations – Opposed by many influential groups (e.g., the US Chamber, ACC, API, NRPA, NAM, APPA, EEI, etc.)?
 - Recognition that compliance will result in significant income redistribution
 - And then ... Massachusetts

Options?

- ❑ What will we actually get?
 - The EPA is moving ahead after an “endangerment finding” to regulate GHGs
- ❑ Will there be legislation?
 - A GHG reductions bill (cap-and-trade or otherwise)?
 - Or perhaps a “clean energy” bill?
 - Or perhaps a “jobs” bill that has significant energy provisions?
 - A bill to stop EPA?
- ❑ And finally:
 - How hard will President Obama push?
 - And for what?

What Do The Proposed Energy Policies Mean For Consumers?

- The proposed energy and environmental policy changes:
 - Will most certainly result in very substantial increases in electricity prices
 - The level of cost increases depends on variables such as the:
 - Auction or allocation of allowances, availability of offsets, inclusion of biomass, the available supplies of natural gas, involvement of either new or existing hydro and nuclear facilities, treatment of “leakage,” the size of the RES (or RPS), etc.
 - Not to mention the general level of the economy
- In any event, electricity price increases can have very significant impacts on basic industry
 - Substantial portions of industry production may be shifted offshore to regions with lower electricity prices and lower (or no) similar energy and environmental policies
 - Resulting in significant losses of manufacturing jobs in the US

Won't Green Jobs Offset The Other Losses?

- The new Administration projects that 5 million “green jobs” will be created over 10 years
 - Vice President Joe Biden said last March
 - These are “jobs associated with environmental improvements and improving the lives of the American People”
 - “Scientists working on an advanced renewable alternative to CO₂-producing fossil fuels is engaged in a green job, as is a laborer winterizing or weatherizing a home, or a lineman or a linewoman building out the smart grid – they’re all green jobs.”
- The stimulus package contains \$20 billion devoted to green investment



Won't Green Jobs Offset The Other Losses? (Cont.)

- However, others question the assertions
 - The ***Washington Post*** on April 19, 2009 reporting on a report from GoodJobs First said:
 - That it is not uncommon for green job wages to be as little as \$8.25/hour
 - Thus, even if the government's claim regarding the creation of new green jobs is correct, the ***Post*** notes "it may inadvertently precipitate the declining stature of the nation's manufacturing and union base."

Won't Green Jobs Offset The Other Losses? (Cont.)

- And a recent study directed by Dr. Gabriel Calzada, an economics professor at Juan Carlos University in Madrid, concluded
 - That every “green job” created in Spain resulted in 2.2 other jobs being destroyed
 - Only 1 of 10 “green jobs” are permanent
 - With 2/3 in construction, fabrication and installation and ¼ administrative, marketing and projects engineering
 - Spain spent €571,138 to create each “green job”
- Certainly some have questioned some of the results of this study*
 - However, questions regarding the benefits of any trade-off between manufacturing and “green” jobs are growing

* See for example *The Wall Street Journal*, March 30, 2009



Conclusions

- The U.S. faces a difficult and uncertain electricity future
 - It is very difficult to build new supply-side resources
 - There certainly is a potential for more energy efficiency and renewables, but they must be cost effective or they will cause more harm than good
 - Cost effective energy efficiency, renewables, and GHG reductions may have a place in the new electricity future
 - But extreme care must be taken to be sure that captive ratepayers are not required to pay lots of money for questionable (at best) results and
 - The negative impacts on the U.S. economy may be great

To Contact ELCON

Phone: 202-682-1390
E-mail: elcon@elcon.org
Web site: www.elcon.org
Address: 1111 19th Street N.W.,
Suite 700
Washington, DC 20036

