



Public Policy and Energy Trends

Beverly E. Jones
Vice President
External Affairs and Policy Development
Consolidated Natural Gas Company

1999 Advanced Turbine Systems Review Meeting

Pittsburgh, Pennsylvania

November 8, 1999

- It's a great pleasure to be here. I've worked on issues related to power generation for about 20 years, and so often the theme has been: "there's a lot of potential, but we're still a few years away." I think that we're finally past that point – we are now on the brink of great change and creativity.
- My focus has been public policy and the energy business – not the technologies. You'll be hearing from many people who can give you the details of technologies. But I want to focus on the big picture – on the interplay of business and technology and public policy trends – and give you my sense of why we're at the brink of such an extraordinary era.
- The time and the place feel right for this conference – and for taking a few minutes to look at the big picture. There's something about the end of a century that makes you want to pause and look back a hundred years or so, and there's no better place for looking at the history of the American energy business than Pittsburgh.
 - The natural gas business was born in this region. CNG's own roots go back almost 120 years, to the days when Rockefeller and his colleagues were creating the natural gas business.
 - On the electric side of the utility business, Pittsburgh can't claim Thomas Edison as a favorite son, but it can point to his arch-rival – George Westinghouse – whose many patents made the modern electric and natural gas industries possible.ⁱ
- So what was happening in Pittsburgh, and other industrial centers, about a 100 years ago? Edison and Westinghouse, and their friends and rivals, were at the peak of a 40-year period in which the modern energy industry was created – and daily life was transformed.
- Well, it wasn't really the start of work on electric lighting. When I looked at the history books I was surprised see how long Edison's predecessors had been at work. Did you know that?
 - Electricity was discovered around 600 BC.ⁱⁱ
 - A glass electric light bulb was built around 1710.ⁱⁱⁱ
 - Various competing inventors created dynamos and incandescent lamps in the 1830s.
- Those early inventors were primarily scientists, and they moved slowly. Edison and his extraordinary contemporaries were businessman, not "pure" scientists. They worked intensely – they were *competing* – to create practical change, fast. What Edison did was create the first *commercially viable* light bulb.

- Edison jumpstarted progress with immense entrepreneurial energy. Beyond that, his real genius was in envisioning the total system, from central generating facility through numerous home appliances.
 - While he struggled to put the first total distribution system in place, the real demand was for Edison's "isolated" electric power systems. He built more than 200 self-contained distributed generation systems while he was working on the first urban distribution system
 - He built that first system in New York City in 1882. By 1899, there were about 2,000 large-scale generating plants around the country and much of the nation was linked by a power system.
- 1899 was a productive time for engineers and entrepreneurs partly because public policy was so supportive.
 - There's never been a time that government leaders have looked more confidently to technology to achieve the public good. At the turn of the century, public policy was about encouraging – not limiting – the reach of engineers and businesses.
 - Of course, now we know that policymakers were ignoring sweeping issues – ranging from child labor to environmental disasters -- but for Edison and Westinghouse, it was a golden age.
- If you look at literature or the arts, you find that 100 years ago the engineer was such an energetic figure that he became a romantic hero of the day.
 - Early in this era, Walt Whitman had written:

“Singing my days
Singing the great achievements of the present
Singing the strong light works of engineers
Our modern wonders...”^{iv}
 - Popular novelists were writing about heroic engineers. Harold Bell Wright had one he called “the seer” – the man who could see the future.^v
 - Edison was the day's Michael Jordan. He was an astronaut, he was a great adventurer – he was the hippest, hottest dude in town. Engineers were studs!
- So what happened – why did the golden age dim so drastically? Of course there are a lot of reasons, but let's look at what happened to the electric industry about the time of the Crash of '29.
 - A classic Federal Trade Commission study documented a utility industry that was very different from the vigorous, competing industry of 1899.

- Merger after merger had occurred. About 49% of utilities were held by just three complex, unwieldy holding companies.
- Not much money was going to R&D. Many of the holding companies had been taking the cash flow from their electric businesses and pouring it into highly leveraged stock plays.
- The collapse of many utilities in the months that followed the Crash had a devastating impact on many communities and on the economy. And so Congress in 1935 responded with one of the more Draconian of the New Deal bills: The Public Utility Holding Company Act (PUHCA).
- I'm not going to bore you with a long discussion of PUHCA, but the main point is that that Act, combined with state legislation that followed it, froze the utility system into a pattern that changed very little for much of the 20th Century.
 - Partly because it seemed so difficult to manage or regulate complicated multi-state utility companies – the information technology to do that just wasn't available – the Act severely limited the ability of utilities to diversify or extend their geographic reach.
 - PUHCA sought to protect shareholders and consumers in part by prohibiting companies from having so many layers, or far-flung operations, that they could hide activities from the eyes of regulators and the public.
 - PUHCA empowered the SEC to break up the large systems into smaller, less diverse utility companies, basically creating the utility industry that we've known for many years.
- That PUHCA model worked pretty well for many years. There wasn't a lot of innovation, but things worked. That's not to say there wasn't change. There was -- like a massive utility nuclear program and the energy crisis in the '70s. But in the big scheme of things, in the utility industry the engineers and technology were not leading the charge (probably it was the MBAs and lawyers who seem to have done quite well in the '70s and '80s and then the information techies in the '90s).
- So why do I feel confident that the time is ripe for a resurgence of engineering and technology? Because the public policy pendulum is swinging once again and there are countless opportunities flowing from energy industry restructuring.
- The forces leading up to federal and state restructuring legislation have been tremendous.
 - With globalization, American industrial users started pushing hard for a move to energy competition, in order to force down energy prices so that they could compete in the world market.
 - Deregulation grew into a national policy trend of sweeping proportions. The changes in banking and telecomm and other industries are having an impact on the way policymakers look at the energy business.

- And – I believe most significantly – the information technology revolution not only resulted in BTU convergence and other sweeping changes in the energy sector, but it gave rise to tools that have obviated much of the *need* for regulation.
- And that brings us up to today, and to an end-of-the-century environment for the gas/electric industry that promises some of the excitement enjoyed by Edison and his colleagues.
- The industry restructuring process is well advanced but there's still much change ahead.
 - Although activities to implement restructuring laws will take a few years, the policymaking changes are perhaps half done.
 - FERC is going forward with wholesale restructuring and its starting to look like Congress may actually act in the next few years.
 - About half the states have passed retail electric restructuring legislation, or done it through regulatory order.^{vi}
 - I think that the policy process is just *responding* to underlying changes, so to me what seems even more important is that the *energy* convergence process is well advanced. An INGAA (Interstate Natural Gas Association of America) study this summer concluded that electric/gas industry convergence is about one-half to two-thirds complete.
- Even though restructuring is far from over, the generation business is already undergoing extraordinary change.
 - While neither federal law nor most states *require* utilities to divest their generation capacity, significant change is occurring in the ownership structure of the generation sector.
 - More than 10% of electric utility generation capacity had been sold.^{vii}
 - We're witnessing the start of a vigorous merchant class.
 - Some states – like Ohio – have included policies favorable to small scale and/or dispersed generation in their restructuring bills.
 - The policy debate has brightened the picture for distributed generation and other technologies considerably. Energy customers are quickly becoming aware that onsite generation is an alternative and they're hungry for information.

- The demand for new capacity looks pretty good.
 - DOE has said that more than 1,000 new plants might be needed by 2020, partly just to replace retiring facilities.
 - The strong economy is bolstering near term demand for capacity, and also assuring that investment capital is available.
- And here's another policy factor that I think the industry still may be underestimating. On this point I'm relying not so much on facts and figures, but on my gut sense, after years of watching the policy process. I think that we're going to see renewed concern about global warming and a new sense of purpose about addressing the issues. That's going to translate into an environment even more supportive of energy efficiency and innovation.
- To summarize my view of the electric generation business today, at the end of the century, I do think that we can enjoy some of the same kind of optimism that Edison and his colleagues could feel.
 - The industry is becoming characterized by competition, with new entrants and new money and new technologies providing the basis of a vigorous environment.
 - There's an excitement in the air. Suddenly these are hot issues, attracting new interest and talent.
 - There are all the hedging and financial tools developed in the '80s and '90s that can be combined with new ways to generate electricity.
 - And of course, there are new, cleaner, more efficient technologies that can be installed in very short timeframes.
- It won't be a simple process. Operating the electric grid is a very technical problem, and it will demand careful thought to maintain reliability and at the same time accommodate all this change.
- But all the factors are in place for a lot to happen in a short period of time. And electric generation technology will be at the forefront of all this change.

ⁱSuch as patents related to gas transmission, alternating current, and telephone switching mechanisms

ⁱⁱ Greek philosopher-mathematician Thales noticed that Amber, when rubbed with cloth or fur, would first attract, and then repel, small objects; much later, this magnetic force was labeled "electrica," after the Greek word for amber.

ⁱⁱⁱ Francis Hauksbee produced a glow from a glass bulb, and called it "electric light"

^{iv} "Passage to India"

^v "The Winning of Barbara Worth"

^{vi} According to DOE, as of 10/1/99 22 states had enacted laws and 3 issued orders.

http://www.eia.doe.gov/cneaf/electricity/chg_str/regmap.html

^{vii} Source: CERA (Cambridge Energy Research Associates)