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NARUC Summer Meeting Issue

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Cover photo: At the last NARUC Annual Convention, Public Utilities Commission of Ohio Chairman Asim Haque and Commissioner Beth Trombold. Photographer: PUF Staff.


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Electricity Eliminated Drudgery, Now Enriching Life

Regulation for Third Era of the Age of Electricity

BY STEVE MITNICK

My grandmother – born in 1898 – didn't have electricity at home growing up. Nor did her children, including my dad – born in 1925 – until the thirties.

By the time of my childhood, in the fifties, residential electric service had become universal. Moms benefitted especially. They now had vacuum cleaners, refrigerators, washers, irons, toasters, sewing machines and more. Electric servants spreading through our society dramatically eliminated one drudgery after another.

Markets became supermarkets with gigantic refrigeration. Food lasted longer. Constant trips to the butcher, baker and produce stand were no longer necessary.

Low-wattage electricity animated electronics, not so much to lift our burdens but to enrich our lives.

Stores, schools and structures of every kind grew. Interior spaces became bigger, brighter and more conducive with better lighting and cooling.


Learn to Let the Housework Slide— Scientifically — in Summer

As the sixties turned into the seventies, dishwashers, garbage disposals, clothes dryers, hair dryers, microwave ovens and air conditioners became commonplace. Less time cooking and cleaning. More time for everything else.

This was the first era of the Electricity Age. High-wattage electricity turned heavy motors and heated filaments. This subtracted mind-numbing time-consuming tasks and added hours to our days.

The second era started in the seventies. By now a far wealthier society, with the home filled with electric servants, low-wattage electricity animated semiconductor-based electronics. Not so much to lift our burdens but to enrich our lives.

Color televisions, sound systems, electronic instruments, CB radios, personal computers, video games, video recorders. Later, several to a home, sometimes one to a room.

As the aughts turned into the teens, in this century, digitization became commonplace. This upped electricity's game again, for the third and present era of the Electricity Age.

At the dawn of the Age of Electricity, Thomas Edison and George Westinghouse wanted – fervently – to better our lives with lighting and motorized applications. Edison and Westinghouse, as Craig Roach points out in his new book "Simply Electrifying," worked backwards from

applications. That's what drove the two great inventors to develop cost-efficient and reliable provision of electricity.

When utility regulation later rewarded investment in the provision of electricity, and when entrants focused on the applications of electricity, Edison's and Westinghouse's successors turned their focus away from applications. Utilities ultimately became grid companies, perfecting the platform for applications to plug and play.

Environmental pressures further pushed utilities from how people used electricity. The premise was that utilities promoted applications – like the all-electric home – to increase demand to increase profitable infrastructure investment. This was strongly discouraged. Reddy Kilowatt, the mascot that celebrated electricity's applications, was retired.

Now we see a return to our roots. There's increased interest and involvement by utilities and utility regulators in applications. Partly this is because applications have become much more energy-efficient. Partly this is because electric generation has become much cleaner. Partly this is because utility profitability is now less tied to demand-driven investment (with decoupling, wholesale deregulation and more emphasis on power lines and less on power plants).

Electric cars. Electric heating. And a slew of new life-enriching applications from robots to 3D-printing to virtual reality to drones to who knows what.

With this renewed interest and involvement in applications of electricity, will we need new regulatory mechanisms? How else can we ensure the public fully benefits from this third era of the Age of Electricity? ❖

Chairperson Ellen Nowak of the Wisconsin Public Service Commission in a fireside chat with CEO Tom Fanning of the Southern Company, at the recent Mid-American Regulatory Conference, held in Chicago.

Xcel Energy®
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A second harvest for America's heartland

The rural community of Courtenay, North Dakota is home to a new cash crop. One hundred wind towers are now spinning above acres of wheat, corn and soybeans. Farmers who lease their land to the wind farm collectively will earn $26.5 million over the next 20 years. Because crops grow around each wind tower, farmers keep farming while also reaping a second harvest with wind each year.

Xcel Energy owns and operates the Courtenay Wind farm that powers 100,000 average sized homes annually.

"We're harnessing the abundant wind resource in our backyard to deliver clean, low cost energy our customers want, while providing the reliable service they need," said Ben Fowke, chairman, president and CEO of Xcel Energy. "The environmental and economic benefits are helping our communities thrive."

Lease payments to local landowners are among the economic benefits for the community. The Courtenay Wind Farm created 200 construction jobs and ten permanent careers. An estimated $850,000 in annual tax revenues will benefit local schools, the fire department, and other services.

Since 99 percent of U.S. wind farms are located in rural communities, wind energy is providing economic benefits to areas of the country that typically need an economic boost.

"By building new wind farms, the wind industry is investing in rural and Rust Belt America," said Tom Kiernan, CEO of the American Wind Energy Association (AWEA). "With a new wave of growth, the wind energy industry invested more than $14 billion in wind farms built in rural America last year."

Wind energy added nearly 15,000 jobs last year, bringing the total number of jobs to more than 102,000 nationwide. Many more communities across rural America will see new jobs and economic benefits as the industry's impressive rate of growth continues.

Xcel Energy is pursuing the nation's largest multi-state investment in wind with proposals to add 11 new wind farms in seven states including Minnesota, North Dakota, South Dakota, Iowa, Texas, New Mexico, and Colorado. Upon approval and completion of the projects, Xcel Energy will increase its wind portfolio by 50 percent while reducing its carbon footprint in the eight Western and Midwestern states it serves.

Xcel Energy plans to build, own, and operate most of its new wind farms. Fuel savings will offset the capital costs to build wind farms and associated transmission lines. Xcel Energy calls the strategy, "steel for fuel," an approach that provides shareholder growth opportunity while locking in low wind prices for years to come, saving customers billions of dollars.

"We're harnessing the abundant wind resource in our backyard to deliver clean, low cost energy our customers want, while providing the reliable service they need."

Ben Fowke, chairman, president and CEO of Xcel Energy

With all the benefits that wind energy provides, Xcel Energy is on point to be a big part of its productive future. And that benefits Courtenay, North Dakota and many communities just like it throughout the nation's heartland.

Charles Bayless: Engineering Climate Change Challenge

We talked with retired utility leader Charles Bayless, who has served in several influential roles in the electricity business.

BY STEVE MITNICK WITH CHARLES BAYLESS

Charles Bayless recently retired as President and Provost of the West Virginia University Institute of Technology. Previously he was chairman, president, and CEO of Illinova Corporation and its wholly owned subsidiary, Illinois Power Company. Prior to joining Illinova Corporation, he was chairman, president, and CEO of Tucson Electric Power Company.

PUF's Steve Mitnick: How can we get our electricity system cleaner, and how can we resolve the disagreement over the final goal?

Charles Bayless: Disagreement is good. The way we make progress is by having fifty different ideas. Forty-eight of all entrepreneurs go bankrupt, but two of them make it.

If you don't believe in climate change you should go back and take freshman physics again. For ocean acidification, high school chemistry will do. It's not hard to understand, like string theory or dark matter.

Ocean acidification is as great a problem as climate change, but it doesn't get as much attention.

It's not only the U.S. The world must change. Even if we got everyone in the U.S. together and we did something, it might set climate change back by a couple of years. But we've got to get the rest of the world to go along too, and that's hard.

The disagreement about the goal arises from our inability to predict exactly what will happen to the weather in fifty or one hundred years. Climate deniers sometime point to this inability as an excuse to delay action. But just because we can't predict weather two months in the future, that doesn't mean there isn't going to be weather.

Every second, we add excess energy equivalent to about two World War Two nuclear weapons to the earth's atmosphere. It is ludicrous to believe we should wait until all of the ramifications are known. By then it will be too late. Ocean acidification is equally as great a problem as climate change, but it doesn't get as much attention. We really have no logical choice but to start doing something about these problems, yet we continue to delay and rationalize because it is inconvenient to act.

The utility system is long-lived. Power plants have forty- to sixty-year lifetimes. It will take a long time for the existing fleet to reach the end of its useful life. In some jurisdictions, there is an economic incentive for utilities to delay closure. We still have a long way to go in solving the problem of turning intermittent power into reliable power. And, we have to consider the expense.

The people who say solar is as cheap as coal are right on a per kilowatt-hour basis. But a lot more goes into the cost of electricity than kilowatt-hours. They are wrong if you compare the cost of reliable delivered energy from renewables with that of fossil fuel.

Renewables cost a lot more. I compare it to copper ore. You can't sell copper ore for the price of refined copper. That's what many renewable energy providers are trying to do with net metering. They are trying to sell "unrefined" energy for the full price and let the utility refine it for free.

If you don't believe renewables cost more, go to Ontario or Germany. I was on the board of the Ontario power authority when we totally phased out coal, and I am very proud of what we did. But rates went up. Governments must make the trade-off between the cost of current electricity and

their grandchildren's future. Ontario made the right choice.

The problem is the cost of externalities. Fossil fuel providers and many in the utility industry are missing the externality costs of carbon. Renewable producers are missing the externality of the cost to refine their product and change it into utility grade electricity. However, if you add in the cost of all externalities and discount the future ones, solar and wind are much cheaper than fossil fuels.

PUF: How far can we go towards getting a high level of renewables?

Bayless: With the existing grid and with a lot of gas turbines, storage and modifications to transmission lines as well as a nationwide high voltage DC grid, I believe we can get up to seventy or eighty percent. But it will be expensive. I view the current debate about how high we can go as largely academic and missing a key point in economics. I believe we can go to one hundred percent, but do we want to? It will be very expensive.

Entropy is at work. It's the law of diminishing returns. For example, if it's going to cost you fifteen cents per kilowatt-hour to get up to eighty percent, it's going to cost you thirty cents per kilowatt-hour to get to ninety percent. It's going to cost you eighty cents to get to a hundred percent.

I made up those numbers. The renewable producers will scream, but they always seem to neglect the externalities of "refining" their intermittent electricity into a finished product. That is where the cost radically increases as we go to higher and higher levels. I am trying to illustrate that we may be wasting money by trying to get to one hundred percent. At some point, society will be better off stopping the upward drive to renewables in the electricity market. And we should use the money saved to reduce carbon in another sector where we can achieve greater reductions at less cost. Of course, as costs come down, the renewable penetration break-even point will move higher.

Even with the increased costs, we have a moral duty to reduce carbon because of the twin evils of ocean acidification and climate change. It's for our children and grandchildren. A lot of people overlook the fact that although there probably are things you can do to mitigate climate change, these actions do nothing for ocean acidification, which is equally as big a problem as climate change.

> **Some California net metering schemes are just for wealthy Californians, while passing on the cost to low-income people.**

PUF: What major investments and new technology are required to solve those problems?

Bayless: Obviously, more renewables and transmission. With a coal, gas or nuclear plant you can take the fuel to the plant. With renewables you must take the plant to the fuel. Hopefully, that fuel (sun and wind) is co-located with the load, as it is in Arizona. Having to take the power plant to the fuel, for example in North Dakota and Texas, leads to much longer transmission runs. One of the best hopes to reduce intermittency is to locate renewables in different locations that require even more transmission. I believe a national high voltage DC grid is the best option for this problem.

Next, you will need a lot of equipment, batteries, gas turbines, DSM and electric cars to turn intermittent power into the reliable "five nines" power.

One of the main drivers of the cost of renewables is the old-versus-new factor. That drives the cost up. Whether the new generation is coal, gas, nuclear, wind or solar, it's replacing old generation with new generation.

Take a reasonable size power company with five thousand megawatts. Let's say they were to decommission a one thousand megawatt coal plant that was depreciated and in rate base for a hundred dollars per kilowatt-hour. What if they then put in a brand new identical coal plant, one with scrubbers? It's going to cost a couple thousand dollars per kilowatt or more, and that's going to drive rates up twenty or thirty percent. Although solar and wind do cost more because they are intermittent, much of the increase is due to replacing old depreciated generation built with 1960 dollars with new full cost generation.

PUF: What is the problem with net metering?

Bayless: If you live where I do near Concord, New Hampshire, and every day you drive to Boston and back, you're not a net zero user of the interstate. But that is what net zero users are claiming for the grid. I say, "If you aren't using it, cut loose," but of course no one will. That's because they are using the grid to buy electricity at one time and selling it at another. They are using it for backup voltage control, frequency control, and so forth. But because their net usage is zero, they claim to not be using the grid.

We cannot continue with net metering the way it is. I'm all in favor of some sort of net metering, but there must be demand charges for transmission, backup generation, ACE balancing, and frequency support. Go to the extreme. If everyone were a net zero customer, then no one would pay anything. But somebody would still have to supply them with power when they weren't generating: provide reliability, voltage control, and so forth. Look at nighttime in New York City, for instance. Who would be supplying power and who would be paying for that?

It always amazes me that solar companies who loudly proclaim the wonders of net zero then turn around and sell batteries to their customers. Those are clearly net zero batteries. Having listened to their rationale for not paying utilities for

furnishing better services than the battery provides, I would have assumed they were giving them away.

PUF: How would you ramp up the low carbon and zero carbon roles on our grid?

Bayless: I would phase out the coal plants in reverse merit order over a stated period of time, taking into account items such as RMR plants. If there were an old coal plant that had a thirteen thousand heat rate, it would be the first to go.

You could also say, "You can only run this coal plant for eight thousand hours this year, next year it's seventy-two hundred hours and the next year it's six thousand hours." At the same time, you could increase RPS standards. A carbon tax or cap-and-trade system would also let the market work to reduce emissions.

One of our problems, but also one of our strengths, is state-by-state regulation. On the strength side we will try fifty different solutions. Through organizations such as NARUC, the best will be passed on and will win. On the problem side, I've often likened utility regulation to the air traffic control system. If we had fifty different air traffic control systems in the U.S., no one could ever fly across the nation because the rules would be different in each state. This makes it hard for renewable producers to operate in many states.

When I was CEO of Tucson Electric, we formed the retail energy provider New Energy Ventures. As we tried to expand we were going nuts. What was mandatory in California was prohibited in Wyoming, okay in Kansas, but frowned upon in Texas. You had to do a business plan for each state. That makes it hard for solar and wind to operate.

I think the difficulty in building transmission is one of the huge problems for the widespread adoption of renewables. I can give you so many examples. When I was at Public Service Company of New Hampshire, we built a twenty-three mile line. It would take around seventeen years to build the line, fifteen to permit and one year to build it. Look at the AEP seven hundred fifty kilovolt line in southern West Virginia, same script. That scenario is unfortunately playing itself out again in New Hampshire with the Northern Pass Line.

I'm amazed at the Clean Line transmission line project that will deliver wind power from Texas to other states. I'm amazed that those guys have been able to pull off the permits for that. I think that's because it's Texas. But in many states all it takes is one landowner to say no, and the project is stalled.

> **We will put in billions of dollars of high-priced equipment, although cheaper alternatives were available.**

As Amory Lovins pointed out years ago, it's cheaper to not use a watt than it is to build a watt of power plant. Energy efficiency is and will continue to be critically important.

The problem with many solutions is the externalities. Externalities make governing anything, especially in the U.S., difficult these days.

Early in our country's history, Farmer Jones lived here and Farmer Smith lived over there. The only externality was smoke from the Jones chimney, if it blew over to Smith's property. There were few externalities. Today, it seems that almost anything we do affects hundreds of different classes of people in thirty different jurisdictions.

Politicians trying to look out for their jurisdictions can't look at the big picture and ask what's the overall cheapest power resource? The problem with building transmission is that there are externalities. It's hard to make those decisions, and it's hard to get approval from the people whose neighborhood the transmission line goes through. All they see is the direct cost and that the line is blocking their view, even though it will provide massive reductions in carbon.

Power lines are probably the cheapest things to build to implement renewables because of what I call the Cleveland effect. If you live in Cleveland, you have five yucky non-windy days in the winter, which is normal, followed by one beautiful sunny, windy day, followed by five yucky non-windy days.

You not only need five days of storage, but, with renewables, because you need to generate all of the power for the batteries in one day, you need six days of generation. That's one day of generation for the current day and five days' worth of generation to charge the batteries. It's incredibly expensive. It would be cheaper to build power lines to North Dakota. But that involves externalities. The U.S. is unlike China, where the government has all the cards.

China can build these things, and they're building them. They just say, we're going to build it. I obviously still prefer living here. But it would really be great if FERC had the same authority for transmission lines that they have for gas pipelines.

PUF: How do you feel about tough state standards?

Bayless: The tougher the better, up to a point. Hawaii, because of its wind potential, is probably in a better position than most states, and I'm very excited about that. I wish the merger had gone through and NextEra could have been approved. NextEra would have really put the pedal to the metal to run a totally or very high renewable grid.

California shows the other side. I worry about California. They're retiring plants at a very fast rate. I hope it doesn't happen, but if there is a large blackout in California because of lack of generator inertia, cascading outages or something, it's not

(Cont. on page 14)

Sheila Hollis: Energy Law Career

We talked with Sheila Hollis, partner and chair of the Washington office of Duane Morris, LLP

PUF'S PAT MCMURRAY, WITH SHEILA HOLLIS

Sheila Slocum Hollis is chair of the Washington, D.C. office of Duane Morris LLP, and was the office's founding managing partner, as well as the founding practice group leader for the firm's Energy, Environment and Resources Practice Group. She was the first director of the Office of Enforcement of the Federal Energy Regulatory Commission, establishing the office and its policies and procedures, serving from 1977 to 1980. She began her energy law career as a trial lawyer at the Federal Power Commission from 1974 to 1975. Sheila is a professorial lecturer at George Washington University School of Law.

PUF's Pat McMurray: When did you get started in the energy business?

Sheila Hollis: I guess you could say I was born into it, because my mother was a draftsman and a nuclear weapons designer. I grew up out west where energy was omnipresent in various forms.

It was just part of the world we lived in. My mother was an electrical and geological draftsman. She was recruited to be a nuclear weapons designer in Hanford, Washington and Los Alamos, New Mexico.

From there she continued in various aspects of energy until she switched her calling. She became a medical artist and finally a heraldic artist at the Department of Defense Institute of Heraldry.

PUF: What made you decide to be an energy lawyer?

Hollis: It was the 1960s and I was a journalism major. I loved to travel and to talk. I was the only child of a very Irish mother. What with my father passing away when I was a young teenager, I had a lot of time to think about everything.

We always had a lot of energy people around us because of my mother's work. There were international scientists, geologists, physicists, engineers, and others. So, by osmosis, basic concepts in science and energy issues were known to me.

Also, consider the early 1970s, with the Arab oil embargo, the gasoline shortages, and energy issues omnipresent. In Colorado, you drove long distances as a matter of course, and were utterly and completely dependent on an automobile. The importance of energy was growing, as were environmental considerations.

I was initially hoping to become a priest, but the church never moved to make women priests, so that was an impediment. I decided to go to journalism school. I was exposed to a lot of energy-related issues at the University of Colorado and I worked at its newspaper. I also worked as a union printer and a stringer reporter for various Denver area papers. I had taken numerous undergrad honors classes, which involved emerging environmental concerns.

President Carter said the energy crisis was the moral equivalent of war. I thought, "This is exciting!"

On a lark, I took the LSAT and ended up doing very well. My journalism professor encouraged me to go to law school. I was one of a handful of women admitted to law school during that time.

There was a batch of about five or six of us that embarked on their law journey at the University of Denver.

At the time, I had absolutely no intention of being an energy lawyer, but I was very interested in international law. I don't even think I knew there was such a thing as energy law. Luckily, I had a great professor at the University of Denver Law School, former Federal Power Commissioner John Carver, who taught

administrative law and prepared me for a career path in it. I had not even heard of the Federal Power Commission until Professor Carver.

Then the assistant to the FPC chairman came out to interview possible candidates for legal positions. I had a great interview with this man. A little basic brochure on the FPC was available as you went into the interview. There were LNG tankers on the front, and I thought, "Wow, this is neat." The focus was on international issues and the beginnings of LNG importation into the U.S., due to the tremendous shortages of natural gas.

A job offer ensued. My basic thought was, "Wage price controls, energy crisis, this could be interesting for a year. I'll go for a year."

I read up on what the Federal Power Commission did, and I showed up the first day on the job. I'd never been to Washington before. I didn't know anyone there, except my former secretary in the Denver law firm that I'd clerked with. She let me sleep on her couch for about the first six weeks in the new job.

PUF: Where was the Federal Power Commission located?

Hollis: Close to where the [successor agency] Federal Energy Regulatory Commission is now, 825 North Capitol Street. It had just moved from the old GAO building on Fourth and Massachusetts Avenue, about Fourth and E Streets.

PUF: When did the Federal Power Commission become FERC?

Hollis: 1977. Under the DOE Organization Act of 1977. That was thanks to President Jimmy Carter, and a smart, active Congress. We were working on a national energy plan, including the Natural Gas Policy Act. Existing agencies were renamed, reshuffled, and jurisdictional powers shifted.

Energy was the number one national issue. Look back at President Carter sitting beside the fire in a sweater. In that major TV appearance, he said the energy crisis was the moral equivalent of war. I thought, "This is exciting!" Then, I thought, I'd go back to Colorado and speak about all things energy that go on in Washington.

PUF: What happened?

Hollis: As the new kid on the block, I didn't even have an office. I sat at a former secretarial desk.

The assistant general counsel had to give me something to do, and in an offhand way, he presented me with an SEC S-1 Registration Statement. That registration statement was for the Pennzoil-United spinoff, which turned out to be an enormous corporate raid.

> **He said, "Is this Sheila Hollis?" I said, "Yes, it is." He said, "This is so-and-so from the *New York Times*."**

The assistant general counsel said: "See if you can find anything here for us. See if there's any jurisdictional context."

This was during the Nixon administration. We didn't have computer capability at all, so I turned to the library and began researching. I pulled out the statute that controls the natural gas business, and I came upon Section Twelve: "Thou shalt not issue a dividend out of a capital account." Then, Section 7 of the statute stated: "Thou shalt not abandon facilities or service without FPC approval."

Well, guess what? They'd issued a dividend out of a capital account. A hundred-million-dollar preferred stock dividend straight up to Pennzoil. And they had abandoned certain aspects of United's services.

That was the beginning, and I wrote a memorandum, more journalistic than legal language, but still very proper. There were enough cites to the law in it to give a fig leaf of legal expertise to the discussion.

I presented it to the assistant general counsel who said, "It's kind of an interesting theory." He put it in his briefcase and went home for the weekend. He was a great assistant general counsel. If you were a young lawyer starting out, he was ideal, ready to go, ready to fight for the people, a very consumer-oriented guy.

He came back on Monday and said, "That was really an interesting memo." I said, "Oh, good. I'm glad you liked it." I didn't hear that much about it. He said, "I'm going to look at it some more." It didn't look like anything was going to happen.

I was back at my desk working late on some other small project, and the phone rang at about eight p.m. There was a very rough voice on the line. He said, "Is this Sheila Hollis?" I said, "Yes, it is. Who are you?"

He said, "Well this is so-and-so from the *New York Times* and I'm holding your memorandum in my hand." The next thing you know, Jack Anderson, the famous columnist, got in on it.

The Commission had to meet with the assistant general counsel. They assembled a team of all the FPC's top people, not just in legal, but also throughout the Commission before responding.

I was assigned the case. We had big hearings before the chief administrative law judge with top energy lawyers from around the country at the counsel tables. One of the first witnesses I ever cross-examined was the CEO of Pennzoil. And then the general counsel of Pennzoil, and the new CEO of United Gas Pipeline. It was the beginning of a whole different ride.

PUF: Who was at fault?

Hollis: Pennzoil was the acquirer of United and sought to spin it off, without many of its valuable assets. United had been a cash-rich, big, heavily regulated utility; Pennzoil was not regulated by the FPC.

United was a key element of national infrastructure because the pipeline and

the gas supply flowed to serve much of the eastern U.S. They owned the gas back in those days.

It was not separate and was not structured like it is today. The United Gas Pipeline owned not only the pipeline, but the production. It impacted homeowners, businesses, local distribution companies and electric utilities, pretty much everyone east of the Mississippi River.

Ultimately, a lengthy settlement discussion ensued and Pennzoil paid back the hundred-million-dollar dividend to United. Pennzoil entered into a long-term gas supply agreement, which provided gas supply to the pipeline during curtailment.

There was also a restructuring of the corporate management. The name of the CEO of Pennzoil was J. Hugh Liedtke. I looked at the name of the United Gas Pipeline CEO, the new one, and his name was J. Hugh Roff. You know, J. Hugh is not a very common name. I talked to some of the experts, and they said, "Yeah, you ought to look into that." Well, he was the nephew of J. Hugh Liedtke. So, it was all family.

It was amazing because it was such a major corporation. They were represented by smart, extremely brilliant lawyers, but so were the customers, states and others impacted by the transaction.

The relationships, the dividend and other factors led to this notion that there was an "incestuous relationship." That was the term that I used in my memo that got picked up by the press.

PUF: After this, you became the head of the Enforcement Office at FERC?

Hollis: I was the first woman director of an office at the FPC/FERC when the Office of Enforcement was created in 1977. That was after a stint in the private arena when I worked with Richard Solomon. He was a former general counsel of the FPC and a leader in communications law. He was also the former head of the Antitrust Appellate Division of the Justice Department. He focused on consumer advocacy.

I was his sole associate during the curtailment period of the gas shortages. He represented the State of New York. That put me right up front in the mix of many of the most significant players in the natural gas business and the utility and production world. As well as the various state regulatory agencies, industrial users, consumer groups and other major players.

> **When they turned off the gas in New York, two hundred and fifty thousand people were suddenly put out of work.**

All the distribution companies up and down the east coast, all the way down to the Gulf Coast, everything on that old United Gas Pipeline system were caught up in that arena. The other pipelines, Tennessee Gas Pipeline, and Texas Eastern Pipeline, served the utilities in New York for residential, commercial, industrial, generation and other uses. There were huge electric utilities involved also.

I was given an unbelievable opportunity, after being suddenly launched out of Colorado, to learn so much about the whole energy business in the country. Without personal or political connections or familiarity with the ways of Washington. It was a rapid-fire education. The natural gas shortage was desperate, the problems enormous and the solutions very big.

When they turned off the gas in New York under curtailments in the winter of 1976-77, two hundred and fifty thousand people were suddenly put out of work. We had to make sure that the immediate needs of homeowners, small businesses, prisons, hospitals, and universities were met. That left the whole world of industrial consumers and electrical generation that was dependent on natural gas, too. We negotiated a deal, approved by the FPC, for Canadian gas to flow to the area and later to provide pay-back in New York power. I had a fast, total immersion into the world of energy law and its influence on the economy and society.

PUF: What were a few of the big cases you worked on at the Federal Energy Regulatory Commission?

Hollis: We did the investigation that led to the first criminal referral under the Natural Gas Act and under FERC law in the history of the FPC or of FERC. We obtained the first major penalties for violations of the Natural Gas Act. We began enforcing environmental and pipeline certificate violations and safety as well. There had been no Office of Enforcement under the Federal Power Commission. Traditionally, the FPC enforced compliance with hydroelectric licenses and compliance with rate orders in gas and electric matters.

PUF: How did the enforcement office get started?

Hollis: There was deregulation of gas, and the needs for enforcement were great in oil (under DOE jurisdiction) and gas and other FERC jurisdictional areas. Over time, the merger of the inter- and intrastate markets, complex pricing and other restrictions ensued.

The Natural Gas Policy Act grabbed all the intrastate market, that is, all the production that had only moved in intrastate commerce versus interstate. The new law regulated literally thousands of new producers who had never been regulated by the Federal Power Commission or the FERC. The Public Utility Regulatory Policies Act, the Power Plant and Industrial Fuel Use Act, and oil price regulations were also in effect, involving the whole complex of issues associated with availability of oil and oil price controls.

The formation of the Office of Enforcement, making that thing fly, getting the regulations in place, defending its honor,

all the rest, was a major effort. We went from zero staff to sixty-five staff when I left in mid-1980.

The team I assembled for the office attracted FERC, SEC, FTC, Justice Department, DOE and other high-quality lawyers and other experts. Many of them continued in energy law and consulting. We built the foundation of the modern, enormously expanded enforcement program at FERC.

PUF: What are the major changes you've seen in the energy world during your career?

Hollis: First is the escalation of our utter and complete dependency on energy to run the world as we know it today. The development of the computer/digital universe, the essential nature of that need, and the need for a reliable energy supply. The blackout of 2003 and then cyber-attacks on the grid have underscored that dependency.

Number two is the development of massive amounts of renewables and

> **If there were a severe energy supply shortage worldwide, there would be chaos. It would be like not having an air supply.**

the need for modification of the grid for those resources.

Third is the issue of climate change. And the recognition that we need to rein in pollutants and encourage cleaner, more efficient ways to address the needs of the planet for food, water, energy and a better environment. Environmental law, in one form or another, has always been ultimately tied to energy issues.

We have restructured the way we develop and receive power. The role that power plays in our lives, as big as it was a hundred years ago or twenty years ago, is ten times bigger now. Energy is viewed as a human right.

I have had the privilege of working worldwide on these critical issues from Ethiopia to Romania to Mexico to China. I'm packing to travel to The Hague as an ABA delegate to the World Justice Forum. I'll present proposed environmental standards to determine the quality of justice throughout the world.

The intensity of the demand for reliable, affordable energy going forward, is huge. Despite the development in efficiency and renewables. We would be unable to survive as a planet without other forms of energy. The world as we know it today would stop on its axis.

If there were a severe energy supply shortage worldwide, there would be chaos. What with the number of people on earth now, and the interconnectedness of global communications, politics, and the military. It would be like not having an air supply. It would be right up there with that. Or not having food. Energy is in that category now. We need it, and finding a way to provide it appropriately is the challenge ahead. ❖

Charles Bayless

(Cont. from p. 10)

going to surprise me. Some California net metering schemes are just printing money for wealthy Californians while passing on the cost to low-income people.

PUF: What's the answer to all these challenges?

Bayless: Full cost accounting. If you read chapter one of the economics textbooks you realize that the market cannot make correct decisions without correct costs. Yet we neglect huge externality costs and then say, "let the market handle it." Without including all of the costs of "refining" electricity in the net metering schemes, the market cannot pick the correct winner. We will put in billions of dollars of high-priced equipment which someone must pay for, although

> **We are sinking our grandchildren's future and saddling them with huge unnecessary costs.**

cheaper alternatives were available.

I am not anti-net metering. I think it can be very valuable, especially in states like Arizona where the fuel (sunshine) is co-located with load. I am against ignoring all of the costs for a market solution. We are sinking our grandchildren's future with carbon emissions and saddling them with huge unnecessary costs with some versions of net metering.

We need to listen to the engineers and not ignore what they're saying. A lot of people say, "Oh, I know the engineers are saying that, but technology will solve the problem." It may, but at what cost? We run the most complex machine in the world, and piecemeal optimization doesn't work in that environment.

Unfortunately, with both climate change and ocean acidification, by the time the average person realizes it is a catastrophe, it's going to be too late. It's irreversible. If we stopped right now, they would nevertheless continue. It's as if you turned on the stove. The water doesn't immediately boil. It takes a while.

Right now temperature has to heat up enough to send out another 0.6 watts of radiation, so it's going to take a while. By the time we recognize this really is bad, with more heat waves, more huge storms, it's going to be too late.

PUF: You seem to have a rather strong opinion on many things.

Bayless: That is one of the advantages of being retired. ❖

Let's Keep Electric Infrastructure Conversation Going

We Should Not Sit Around Until Major Blackout

BY JON JIPPING

Investing in America. Strengthening our economy. Rebuilding our infrastructure.

These are all themes that have gained new life in the national dialogue in 2017. The transmission grid, itself a vital piece of infrastructure, enables investment and economic growth. Like other vital American infrastructure, the grid is aging and in need of investment. As the focus on infrastructure intensifies, the power grid must be part of that conversation.

Transmission infrastructure isn't something most Americans think about every day. But keeping electricity reliable and resilient and keeping our communities safe requires an enormous amount of work, investment, collaboration and coordinated, long-term planning.

Seventy percent of our transmission lines and power transformers are over twenty-five years old.

Our society is putting increasing demands on electric infrastructure that wasn't designed to support today's needs. Much less what we will be asking of it ten, twenty or thirty years from now. We will be living in a more energy-diverse, technologically-advanced future.

Because it can take up to ten years to plan, permit and build large transmission projects, we can't wait another decade to start planning for our energy future. Now is the time for companies, regulators, policymakers and the public to work together.

We must not wait until another major blackout occurs to face up to the fact that our grid is an aging network. Seventy percent of our transmission lines and power transformers are over twenty-five years old. We need to ensure the electric grid can keep pace with increasing inputs and modern demands so that it can effectively continue to play its critical role.

There is a clear fiscal case for grid modernization and improved planning. According to the Department of Energy, major power outages and power quality disturbances cost our economy between twenty-five billion and one hundred-eighty billion dollars annually.

A white paper issued last year by The Brattle Group on behalf of industry group WIRES says reforming transmission planning is the key to unlocking as much as forty-seven billion dollars in annual customer electric bill savings. That is due to a rapidly changing generation landscape.

ITC is the nation's largest independent transmission company, with high-voltage power lines now expanding to eight states across the Midwest and Great Plains. It is uniquely positioned to design, build and operate transmission projects. Those projects come without service territory constraints or market participation, and they address the gaps in our nation's transmission infrastructure. As part of the Fortis family of companies, ITC has a new reach and ability to serve customers on both sides of the border.

Our first job is to provide reliable and resilient power to our customers. To that end, we have steadily improved the performance of the three transmission systems we acquired beginning in 2003.

With greatly reduced outages, much lower congestion and outstanding customer service our systems are among the best in the U.S. These improvements

(Cont. on page 32)

Jon Jipping is Executive Vice President and Chief Operating Officer of ITC Holdings Corp.

Considerations for New Utility Business Model

Public Interest Comes First

BY KEN COSTELLO

Experts define business models differently, but they all come down to how a company makes money. A business model has three essential parts. First, the value proposition, or what the company offers to its customers. Second, value creation and delivery. Third, value capture, or how the company retains the value it has created for its customers.

A company must produce something that has enough value to customers to make a profit. Essential factors are what services a company offers its customers, how it prices those services and what costs it incurs.

A business model links different elements of a company's operations in a harmonious and complementary way. It is broader than a strategy, which is a plan to reach a goal.

Instead, a business model describes how the pieces of a business fit together to make it profitable. It is really a holistic perspective on a commercial enterprise that strives for financial viability by selling a product or service.

What makes a utility business model unique? Besides making money, the utility has a duty to serve the public interest in noncommercial ways. Utilities must not only function as for-profit enterprises in covering their costs.

Rather, they must also fulfill social obligations. These have proliferated to include subsidizing their competitors and their customers to use less of their service, promoting clean energy and making their service affordable to all customers. A major example is rooftop solar plus net metering.

These obligations require utilities to take on additional costs and be less economically efficient. That handicaps them against their new competitors who have no such obligations.

The utility business model should not only respond to new technological and market developments, but it should also satisfy broad social objectives. That, in addition to supporting traditional regulatory objectives such as just and reasonable rates.

These are daunting tasks that call for utilities and their regulators to balance these different goals, which are often irreconcilable.

When regulatory policies fail to align with the business model, the utility may depart from its strategy to achieve predefined objectives. One example is a business model that accommodates distributed energy resources by creating a platform. However, regulation may provide the utility with no opportunity to profit from it.

A broader example is when the utility receives no financial gain from satisfying customer-oriented objectives mandated by its regulator.

Ken Costello serves as principal researcher for energy and environment at the National Regulatory Research Institute. He previously worked for the Illinois Commerce Commission, the Argonne National Laboratory, Commonwealth Edison Company, and as an independent consultant. Contact him at kcostello@nrri.org.

Doing nothing to change despite declining demand, increased competition or major technological shifts spells doom for any company.

What a Business Model Should Do

A business model affects a utility's financial stability and even its survival. For example, it can grow a utility's revenue

or prevent revenue erosion by allowing it to offer new services and expand its functions.

A business model should also protect a utility's competitors from undue discrimination by the utility. It should not be able to leverage its monopoly power over essential facilities such as the electric distribution system.

In fostering long-held regulatory objectives, a business model should maximize the long-term welfare of utility customers. Those customers may be traditional or engaged, and they may demand different things from their utility. Not all customers want just plain vanilla service.

In meeting the demands of engaged customers, a utility may have to revamp its business model to include three elements. They are the availability of unbundled products and services, real time information, and enabling technology.

In today's environment, a business model should also provide the utility with both the incentive and ability to innovate. At least, it should allow third parties to serve the utility's customers with new services and technologies.

Utilities may have to become more innovative in satisfying engaged customers. A well-structured business model can provide utilities with robust incentives to exploit new technologies for the benefit of its customers.

A business model should direct a utility to achieve commercial success and public policy goals at the lowest societal cost. If the objective is to promote renewable energy, the utility should have the incentive to foster the most economical sources. Those may be utility-scale solar rather than rooftop solar.

Potential Problems with the Status Quo

A present concern is that while the traditional utility business model may have worked well up to now, it may fail in the future. In simple terms, that business model is generating electricity from central power stations and delivering it to passive customers reliably and at reasonable cost. The future could bring changing conditions triggered by customer engagement, expansive public policy and new technologies.

It is common for unregulated companies to consider a new business model under dynamic market conditions. Companies often experience financial difficulties because the foundation of their business model derives from faulty assumptions.

> **We surely want to avoid a sort of Gresham's Law in which bad business models drive out good ones.**

Doing nothing to change a business model in the face of structural declining demand, increased competition or major technological shifts spells doom for any company. No matter how well-run and successful it was in the past.

For electric utilities, most business models today assume one-way electricity flow on the distribution system. That flow is directed at passive customers with limited choices. And it assumes narrow objectives such as just and reasonable rates and high service reliability. It also assumes growing demand, minimal competition beyond the meter, and utility profitability dependent almost exclusively on sales and the size of the rate base.

These assumptions either no longer exist or are eroding. The time seems ripe for utilities, along with their regulators, to re-evaluate the existing business model.

Utilities and their regulators should review whether the current business model may fall short. Does it give utilities the opportunity to earn an adequate rate of return, provide utilities an incentive to maximize long-term customer welfare, and accommodate new entrants who offer benefits to their customers?

It would not be surprising to find the current utility business model unsustainable and socially damaging, given all the changes that are going on simultaneously. Reasons include faulty ratemaking. For example, using volumetric rates to collect fixed costs. Other reasons include lack of value-added services to satisfy engaged customers and restrictions on services offered by utilities. Include the presence of distribution systems ill-equipped to perform platform functions accommodating DER.

Risk in Choosing the Wrong Business Model

There is the obvious question of who should decide the merits of a utility's new business model and what form it should take. In contemplating a new business model, a utility should select one that will steer its financial and market performance toward meeting society's demands. Those are reflected in public policies, actual market conditions, prevailing technologies, and customer behavior and preferences. Regulators should work with a utility to achieve this goal.

Market developments could aggravate greater future uncertainty. There is the chance that a misjudgment or simply an inability to predict the future may lead a utility to select the wrong business model. The public policy discourse so far has focused more on not doing enough than on doing too much to revamp the utility.

Utilities and their regulators should consider the risks associated with both over-reacting and under-reacting to the expected changes for the electric industry. There is a potential cost to both. Each can jeopardize the utility's financial viability and the welfare of customers.

We surely want to avoid a sort of Gresham's Law in which bad business models drive out good ones. Lord Keynes

(Cont. on page 19)

Jousting at Windmills

Maryland PSC Subsidizes Offshore Wind

BY ROBERT BORLICK

On May 11, 2017, the Maryland Public Service Commission approved electricity rate increases to fund two wind projects to be sited off the Ocean City shoreline. When I first learned of this the image of Don Quixote jousting at a windmill came to mind. Then, after reading the Commission order, my amusement morphed into outrage.

That order burdens Maryland's electricity consumers with a two-billion-dollar tab. To subsidize the renewable energy, the projects will sell to the state at a price that is three to four times higher than that being offered by onshore wind and large-scale solar PV projects. Even more outrageous, these purportedly green energy projects may actually increase regional carbon-dioxide emissions! In what world does this make sense?

The Maryland Offshore Wind Energy Act of 2013 authorizes the Commission to raise electric rates to support approved projects but exempts large industrial and agricultural customers from such rate increases. Consequently, Maryland's residential and smaller business customers will bear the full cost of the subsidies.

However, the Act includes two important consumer protections. One prohibits the Commission from approving any project that does not "…demonstrate positive net economic, environmental and health benefits to the State…" based on a cost-benefit analysis, which must account for "…any impact on residential, commercial, and industrial ratepayers over the life of the offshore wind project…."

The other protection caps the combined costs imposed by all approved projects at a maximum of one dollar and fifty cents per month (in 2012 dollars) for residential customers. The limit is set at a maximum of a one and half percent increase for business customers' bills.

The Commission hired a consultant, Levitan & Associates, to evaluate the offshore wind project proposals. Levitan estimated that the two projects will raise residential customers' bills by about one dollar and forty cents per month and business customers' bills by about 1.4 percent, starting in 2020. When viewed on a per-customer basis, these increases appear modest, but the present value of these payments, extending over twenty years, will exceed two billion (in today's dollars).

Levitan also estimated that the projects will create about ninety-seven hundred one-year, full-time equivalent jobs. Dividing two billion by ninety-seven hundred reveals that each job will cost the state more than two hundred thousand dollars per year! These are mostly skilled blue-collar jobs paying about one hundred thousand per year.

The Commission never compared either project's impact on costs with the monetary value of its expected benefits.

Consider this: instead of subsidizing these offshore wind projects, suppose the Comptroller of Maryland were to cut ninety-seven hundred checks for a hundred thousand dollars each and randomly send them to the state's unemployed

Robert Borlick is an energy consultant with more than 40 years of experience related to the electric power industry. He previously held partner-level positions in two international consulting firms, Putnam, Hayes & Bartlett, Inc., and Hagler Bailly, Inc.

construction workers. Wouldn't everyone in Maryland be better off?

The workers would enjoy the same income without the hassle of going to work each day and electricity consumers would incur much smaller bill increases. This farcical proposal suggests that there must exist better, cheaper ways for the state to create jobs and promote economic growth than investing in these outlandishly expensive projects.

The term cost-benefit analysis referenced in the Act implies that costs should be compared with benefits, expressed in comparable units of measure. The Act uses clear language requiring each project to satisfy the cost-benefit analysis, which is described in some detail. But the Commission never compared either project's impact on ratepayers' costs with the monetary value of the benefits the project is expected to deliver.

Instead, the four commissioners interpreted the statutory language as allowing them to simply consider the economic, environmental, and health benefits on a standalone basis. They defended this interpretation, proclaiming "The Commission retains discretion as to the weighting and relative importance of one criterion versus another in effectuating the evaluation and comparison of the Applications." But assigning a zero weight to the ratepayer's impact criterion directly conflicts with the Act. It represents arbitrary and capricious decision-making, which the courts have consistently struck down.

If the Commission had subjected the projects to bona fide cost benefit analyses it is inconceivable that either would pass. That is because their extremely high offer prices are three to four times higher than those being offered by onshore wind or large-scale solar projects. In fact, a Commission staff witness presented testimony pointing out this cost disparity.

It is also noteworthy that the Commission staff did not recommend approval of either project. Instead, it stated that "The issue of cost should be of paramount consideration in the determination the Commission must make in this proceeding."

> **Sadly, environmental groups supported these potentially environmentally destructive wind projects.**

But the story gets even worse. Levitan concluded that the two projects will not reduce carbon dioxide emissions, and may actually increase them. While they will reduce emissions in Maryland they will increase emissions, most likely by a larger amount, in the western region of PJM.

However, the Commission only considered carbon dioxide emissions in the state of Maryland and dismissed its own consultant's finding, which is based on detailed modeling of the PJM power system.

Even if the Act purposely intended to ignore adverse environmental impacts on neighboring states, the Commission was wrong to claim positive environmental benefits for Maryland because carbon dioxide emissions do not produce any significantly adverse local effects.

In contrast, increasing total regional emissions contributes to climate change and thereby substantially harms the state. Because of its extensive shore line, Maryland is particularly susceptible to rising sea levels.

Despite the overwhelming evidence against approving these exorbitantly expensive and potentially environmentally destructive projects, the Commission was undeterred. It appears to have revealed its true agenda in stating, "… the State has already made the policy decision to authorize Offshore Wind development and the ratepayer impacts that may result from it…." Then why did the legislators see fit to include a cost-benefit analysis requirement?

Sadly, the only participant in the proceeding that showed concern for electricity consumers was the Office of People's Counsel. The staff at that office opposed both projects, correctly pointing out that the evidence in the record did not support a finding that the projects' benefits will exceed their costs.

Even sadder, the Sierra Club and the Maryland League of Conservation Voters, organizations that claim to be defenders of the environment, supported these wind projects – even though they were aware that the projects are likely to increase regional carbon dioxide emissions.

This is one of the worst abuses of regulatory authority I have witnessed in almost forty years of work with the electric power industry. The Commission's decision cries out for judicial review. Unfortunately, none of the parties chose to appeal it.

Promoting renewable energy is generally a good thing – except when taken to the ridiculous extreme on display in this order. Marylanders deserve better than this. ❖

Ken Costello

(Cont. from p. 17)

once remarked that "The difficulty lies not with the new ideas, but in escaping the old ones."

Not to discredit Lord Keynes, but sometimes sticking with old ideas is not a bad thing. Especially when interest groups market new ideas for personal gain or for ideological reasons at the expense of the public. We have certainly seen no lack of this in the recent efforts to transform the U.S. electric industry.

So, regretfully, I end on a sour note: The utility business model that we eventually see may fail to best serve the public interest. ❖

Public Utilities Fortnightly Quant Services

Monthly Summary Report: July 2017

BY STEVE MITNICK
Editor-in-Chief, Public Utilities Fortnightly
Author, "Lines Down: How We Pay, Use, Value Grid Electricity Amid the Storm"

Sections:
I. PUF QS Electricity Value Index
II. PUF QS Zero-Carbon Scorecard
III. PUF QS Distributed Intermittent Metric

Public data from the U.S. Departments of Commerce, Energy, Housing and Urban Development, and Labor are available to anyone. But quant Steve Mitnick has been compiling components of these data that few noticed or used, years before he became PUF Editor-in-Chief, for unique insightful analyses about utility regulation and policy.

Now, with PUF QS, we provide these analyses to members of the PUF community with site licenses.

For further information, reach out to Joe Paparello, paparello@fortnightly.com.

I. PUF QS Electricity Value Index, July 2017

Electric rates and bills generally increase over time. Sure. But the price of most goods and services, and what we pay for most goods and services over a month or year, generally increases.

Electricity in this regard is no different from any other good or service. There's inflation in our economy. There's growing income, averaged. And with growing income, there are growing consumer expenditures.

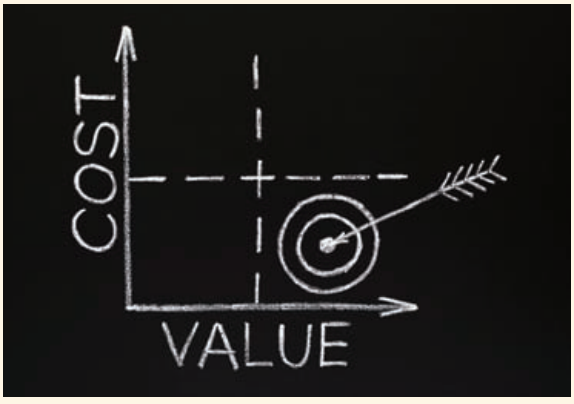
What counts to consumers, or should count, is the horse race. Which horse (good or service) is gaining ground on the others? Which is falling further behind?

Those goods and services that are gaining ground, in their consumer prices or payments, are becoming more expensive. Those falling further behind are becoming less expensive.

Some consumer costs have increased rapidly. Health care and college tuition are prime examples. Some costs have increased but at a slower pace, like housing. Or have decreased, like clothing.

In an economy like ours, with inflation, something becomes more expensive if its price increases faster than the price of everything, averaged. And with growing income and consumer expenditures, something becomes more expensive if what we pay over a month or year increases faster than what we pay for everything.

Let's see how electricity is doing in this horse race of prices and payments over time.



CPI Electric Rates vs. CPI Inflation

To track the average price of the goods and service that American consumers buy, the U.S. Department of Labor calculates the Consumer Price Index.

There's a CPI for all the goods and services that consumers buy. And there's a CPI for categories of goods and services, including residential electric rates.

Compare the CPI for electric rates with the CPI for all goods and services. Doing so shows if electric rates are increasing faster or slower than the price of other things. And, therefore, it shows if electricity is becoming costlier or less costly to consumers.

The following percentages are easy to understand. 100% means the CPI for electric rates and the CPI for all goods and services increased at the same pace since the Labor Department's base period (the years 1982 through 1984). At 100%, electric rates aren't becoming costlier, and they aren't becoming less costly.

The lower that these percentages are, the slower the CPI for electric rates has risen as compared to the CPI for all goods and services. So, the lower these percentages are, the less costly electricity has become.

CPI Electric Latest Month – U.S. (May 2017)

86.9%

Record High (June, August 1955): 106.7%
Record Low (May, June 2000): 74.3%
Year Earlier (May 2016): 86.2%
Two Years Earlier (May 2015): 88.1%

CPI Electric Latest Quarter – U.S. (Q1 2017): 85.8%

Record High (Q2, Q3 1955): 106.4%
Record Low (Q2 2000): 74.4%
Year Earlier (Q1 2016): 86.7%
Two Years Earlier (Q1 2015): 89.8%

CPI Electric Latest Year – U.S. (2016): 86.2%

Record High (1955): 106.2%
Record Low (2000): 74.6%
Year Earlier (2015): 88.3%
Two Years Earlier (2014): 87.9%

CPI Electric Latest Month - Northeast (May 2017): 78.3%
CPI Electric Latest Month - South (May 2017): 78.3%
CPI Electric Latest Month - Midwest (May 2017): 88.5%
CPI Electric Latest Month - West (May 2017): 112.8%

Source: Bureau of Labor Statistics, U.S. Department of Labor. Public Utilities Fortnightly maintains a comprehensive historical and updated data base of the CPI for electric rates, the CPI for all goods and services, and our own analyses of these indices. Sixty-five years of monthly U.S. data. Forty years of monthly regional data.

Electric Bills' Share of Consumer Expenditures

The U.S. Department of Commerce calculates the Gross Domestic Product. Since consumer expenditures are around seventy percent of the GDP, the Commerce Department tracks consumer expenditures in extraordinary detail.

The following percentages are easy to understand. 2% means that one-fiftieth of consumer expenditures goes to pay electric bills. 1% means that one-hundredth of consumer expenditures goes to pay electric bills.

The lower these percentages are, the smaller is electricity's share of consumers' budgets. And the larger is the share of consumers' budgets for all other goods and services.

So, the lower these percentages are, the less costly electricity has become. And the wealthier that consumers have become.

Electricity Share Latest Month – U.S. (May 2017)

1.40%

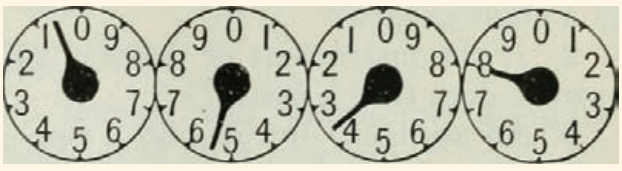
Record High (June 1981): 2.53%
Record Low (February 2017): 1.22%
Year Earlier (May 2016): 1.39%
Two Years Earlier (May 2015): 1.44%

Electricity Share Latest Quarter – U.S. (Q1 2017): 1.28%

Record High (Q3 1983): 2.37%
Record Low (Q1 2017): 1.28%
Year Earlier (Q1 2016): 1.34%
Two Years Earlier (Q1 2015): 1.51%

Electricity Share Latest Year – U.S. (2016): 1.39%

Record High (1982): 2.27%
Record Low (2016): 1.39%
Year Earlier (2015): 1.44%
Two Years Earlier (2014): 1.49%



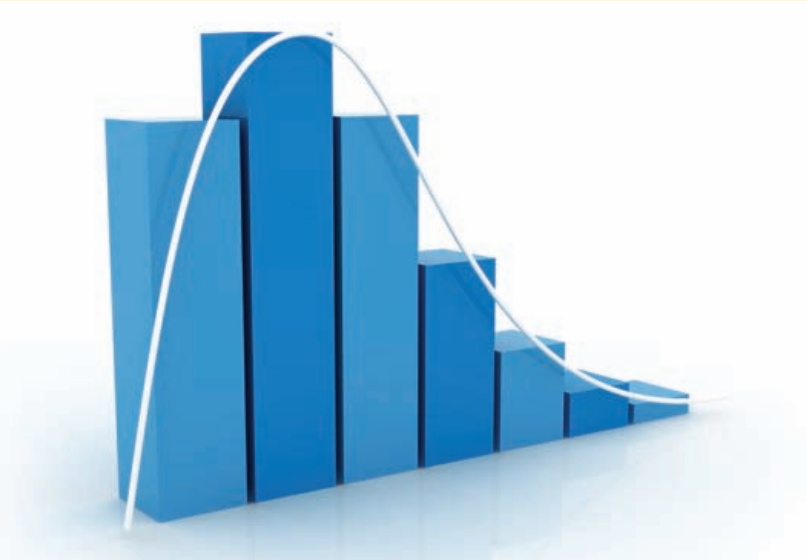
Source: Bureau of Economic Analysis, U.S. Department of Commerce. Public Utilities Fortnightly maintains a comprehensive historical and updated data base of consumer expenditures, and our own analyses of the data. Fifty-eight years of monthly data.

II. PUF QS Zero-Carbon Scorecard, July 2017

Many Americans want their electricity to be low-carbon (emitting little carbon dioxide when the electricity is produced). Some go further; they want their electricity to be zero-carbon.

The industry, responding, is moving to the green grid. It's growing the zero-carbon share of the total. From hydro, nuclear, solar, wind, and other methods of manufacturing electricity that don't emit carbon dioxide. And it's pruning back the high-carbon share of generation, from coal.

How's it going, this gardening of the green grid? Let's see.



Zero-Carbon's Share of Grid Generation

The U.S. Department of Energy tracks in extraordinary detail the origin of the grid's electricity. Each month, it publishes total electric generation and the breakdown by manufacturing method.

Some of these methods emit carbon dioxide. Coal, natural gas, other gases, petroleum. Some don't. Net. Geothermal, hydro, nuclear, solar, waste, wind, wood.

The Scorecard adds the amount of the grid's electricity produced by the zero-carbon methods. And then calculates their share of all grid electricity.

The following percentages are easy to understand. 25.0% would mean that a quarter of the grid's electricity is zero-carbon. The U.S. grid hit and surpassed 40.0% zero-carbon for the first time in March 2016. At 40.0%, four of every ten kilowatt-hours produced by the grid didn't emit carbon dioxide.

Zero-Carbon Latest Month (April 2017)

41.5%

Record High (March 2017): 41.6%
Record Low (September 1973): 16.2%
Year Earlier (April 2016): 39.8%
Two Years Earlier (April 2015): 36.7%

Zero-Carbon Latest Quarter (Q1 2017): 40.4%

Record High (Q1 2017): 40.4%
Record Low (Q3 1973): 16.6%
Year Earlier (Q1 2016): 38.1%
Two Years Earlier (Q1 2015): 33.6%

Zero-Carbon Latest Year (2016): 35.1%

Record High (2016): 35.1%
Record Low (1973): 19.5%
Year Earlier (2015): 33.1%
Two Years Earlier (2014): 32.8%

Hydro's, Nuclear's, Solar's, Wind's Share of Grid Generation

Here we show the shares of the grid's electricity by four major zero-carbon methods: hydro, nuclear, solar, wind.

The grid's solar and wind are rapidly growing. And, so, their latest numbers are typically record highs or nearly so. Nuclear has maintained a share near its record high for over two decades. Hydro, on the other hand, has been well below its record high in recent decades.

Hydro Latest Month (April 2017): 10.0%

Record High (April 1974): 19.8%

Record Low (September 2007): 4.1%

Nuclear Latest Month (April 2017): 19.3%

Record High (January 1995): 22.6%

Record Low (January, May 1973): 3.9%

Solar Latest Month (April 2017): 1.6%

Record High (April 2017): 1.6%

Record Low (all but six months before March 2012): 0.0%

Wind Latest Month (April 2017): 8.7%

Record High (April 2017): 8.7%

Record Low (most months before January 1998): 0.0%

Coal's Share of Grid Generation

Here we show the share of the grid's electricity by the major high-carbon method, coal. Its share has been at or near a record low in recent years. And around half of its record high set in the 1980's.

Coal Latest Month (April 2017)

27.9%

Record High (January 1986): 59.8%

Record Low (March 2016): 23.7%

Source: Energy Information Administration, U.S. Department of Energy. Public Utilities Fortnightly maintains a comprehensive historical and updated data base of grid generation by method, and our own analyses of these indices. Forty-four years of monthly data.

III. PUF QS Distributed Intermittent Metric, July 2017

The pages of Public Utilities Fortnightly and discussions generally in the utilities industry often address the growth in distributed and intermittent electric generation and its implications. But how rapid is this growth? And is the pace increasing or decreasing? The answers to these questions can dictate utility strategies and regulatory policies.

The nation's electricity supply, particularly beyond the state of California, remains overwhelmingly grid-scale, more than ninety-nine percent. California distributed generation, alone, is over four-tenths of that narrow one-percent slice.

However, intermittent (weather-dictated) generation can be and is most frequently grid-scale. As a result, while the nation's electricity supply remains mostly dispatchable, nearly ten percent is now wind and solar photovoltaic, and intermittent.

Distributed Generation's Share of Grid and Distributed Generation

The U.S. Department of Energy tracks in extraordinary detail the origin of the grid's electricity, as stated earlier. Each month, it publishes total electric generation and the breakdown by manufacturing method. Recently, the Energy Department started publishing data on distributed generation to supplement its data on grid-scale generation.

This metric is the percentage of all electricity generation, grid-scale and distributed generation, that is attributable to distributed generation.

The following percentages are easy to understand. 0.5% means that one out of every two hundred kilowatt-hours of our nation's electricity are produced by distributed generation (mainly residential, commercial and industrial solar photovoltaic). When the percentage reaches 1.0% in the next few years, this would mean that one out of every one hundred kilowatt-hours are produced by distributed generation.

Distributed Latest Month (April 2017)

0.8%

Record High (April 2017): 0.8%
Year Earlier (April 2016): 0.6%
Two Years Earlier (April 2015): 0.4%

Distributed Latest Quarter (Q1 2017): 0.5%

Record High (Q2 2016): 0.6%
Year Earlier (Q1 2016): 0.4%
Two Years Earlier (Q1 2015): 0.3%

Distributed Latest Year (2016): 0.5%

Record High (2016): 0.5%
Year Earlier (2015): 0.3%
Two Years Earlier (2014): 0.3%

Residential Distributed Latest Month (April 2017): 0.4%
Commercial Distributed Latest Month (April 2017): 0.3%
Industrial Distributed Latest Month (April 2017): 0.1%

Intermittent Generation's Share of Grid and Distributed Generation

The U.S. Department of Energy tracks in extraordinary detail the origin of the grid's electricity, as stated earlier. Each month, it publishes total electric generation and the breakdown by manufacturing method. Recently, the Energy Department started publishing data on distributed intermittent generation to supplement its data on grid-scale generation.

This metric adds the generation from grid-scale wind and grid-scale solar photovoltaic and from distributed generation solar photovoltaic. Distributed generation wind is presently at a relatively insignificant level.

The following percentages are easy to understand. 10.0% means that one out of every ten kilowatt-hours of our nation's electricity are produced by intermittent generation (mainly residential, commercial and industrial solar photovoltaic). When the percentage reaches 20.0% in the future, this would mean that one out of every one five kilowatt-hours are produced by distributed generation.

Intermittent Latest Month (April 2017)

11.0%

Record High (April 2017): 11.0%
Year Earlier (April 2016): 8.6%
Two Years Earlier (April 2015): 7.3%

Intermittent Latest Quarter (Q1 2017): 8.6%

Record High (Q1 2017): 8.6%
Year Earlier (Q1 2016): 7.2%
Two Years Earlier (Q1 2015): 5.1%

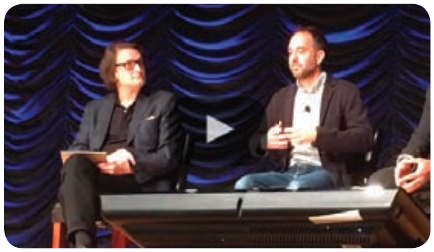
Intermittent Latest Year (2016): 6.8%

Record High (2016): 6.8%
Year Earlier (2015): 5.5%
Two Years Earlier (2014): 5.1%

Source: Energy Information Administration, U.S. Department of Energy. Public Utilities Fortnightly maintains a comprehensive historical and updated data base of generation by method, and our own analyses of these indices. Forty-four years of monthly data for grid generation and three years for distributed generation. The Energy Department started collecting distributed generation data in 2014.

Public Utilities Fortnightly Audio and Video: July 2017

PUF's Pat McMurray and Steve Mitnick captured some of the passion and "energy" of Exelon's Innovation Expo in these nine brief videos. Two show excerpts of panel discussions, and seven show enthusiastic employees contesting for innovation prizes.



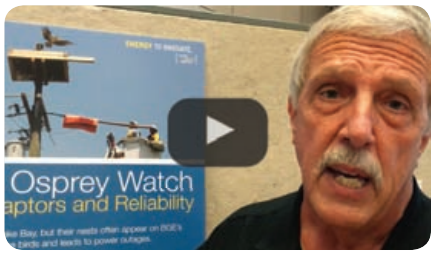
Doug LeMoine, Apple Design Evangelist for Apple Development, in a discussion entitled Customer Centricity with panelists from Exelon, GE, and Northwestern University. Duration: 35 seconds.

"Nikki Neutron" visits schools on behalf of PECO Energy, helping students in grades K-5 learn how to stop energy from being wasted. She explains the concept of energy efficiency. Duration: 09 seconds.

Maggie FitzPatrick, Exelon SVP - Corporate Affairs, Philanthropy and Customer Engagement, in a discussion entitled Customer Centricity with panelists from Apple, GE, and Northwestern University. Duration: 48 seconds.

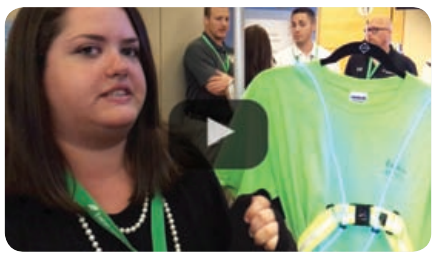
The Constellation underwater drone eliminates the need for a human inspector in a storage tank. It can also be dropped into water outside a nuclear plant to inspect exterior walls. Duration: 26 seconds.

BGE's Captain Mercaptan gives students a safety message about being alert to the smell of natural gas. He visits schools to explain what steps to take if students smell that odor. Duration: 33 seconds.



Ospreys in the Chesapeake Bay area have caused more than 100 power outages in the last ten years. BGE workers place deterrents on the utility poles after removing the nests to a safer location. Duration: 33 seconds.

A virtual reality program being drafted at ComEd supplements the curriculum for new utility trainees. It shows scenarios they could encounter in the field. Duration: 29 seconds.



Bright lights connected to a battery on this PECO harness can be seen for a mile in every direction. Demonstration of the harness, front and back. Duration: 19 seconds.

You navigate this Constellation website with voice commands. It sells electricity directly to consumers. It's especially useful for the visually impaired. Duration: 36 seconds.

Pioneers Forever

Humanity's Drive to Achieve More

BY ROGER WOODWORTH

The Wright Brothers secured their place in history with the Kitty Hawk Flyer. That first flight in 1903 covered just a hundred-twenty feet in twelve seconds. Two years later, Wilbur Wright flew Flyer III in circles, keeping the machine airborne for thirty-nine minutes before running out of fuel.

The duration of the Flyer III flight was impressive. More important was the circling. They demonstrated lateral control for the first time. Steering moved flight from mere novelty to a plausible commercial opportunity.

Give the Wrights due credit, but the truth is the path to human flight was worn over centuries. The notion is revealed in Greek mythology and was inspired by Leonardo da Vinci's illustrations. The reality advanced over the 18th and 19th centuries from trials with wings, balloons, gliders, and finally to the airplane.

Bigger, faster, cheaper, further. Innovation around the fundamentals of flight took hold. From propellers to jets to supersonic speeds and precision controls. Propulsion opened the heavens, and more.

Today, personal jet packs, like those in the Jetsons cartoon, are nearing commercial production. Drones for all kinds of uses, including as taxis for people, are in development. Several companies are working to commercialize flights to space (and back!). And, as scientists peer closer to the edge of the universe, human flight to inhabit other planets has entered public discourse.

The pioneering spirit is innate.

Similar stories of pioneers are found in so many platforms, both practical and creative.

Delve into the history of any medical device, musical instrument, or public health practice. Plot the transition of horse-and-plow farming to precision agriculture or of print shops to digital publishing.

Marvel at the immense influence of connectivity: the Silk Road; the Erie Canal; inter-continental rails and roads; global air travel; and the Internet.

Consider, too, the most empowering invention of all time, electricity. The discovery and commercialization of electricity stands as a stellar example of ingenuity.

Every expression of humanity is advanced by trailblazers.

Ingenuity follows a trajectory, as we see with the past, present, and future of flight. The direction of change is largely defined by pioneers and those who enable them. The pace of change is influenced by other factors, such as customers, investment, business models, public policy, regulation, and the like.

When it comes to utilities, one sensible role is to optimize the performance of in-place systems. Another is to leverage the incumbent advantage of resources, scale, and insight to pioneer new value.

Unfortunately, most utilities appear to be caretakers. They are good stewards of what is, not advocates for what can be. Too few strive to discover and develop an ever-more valuable future.

The Wrights fought hard to secure their patents. But they did little else and didn't earn much as a result.

Roger Woodworth, principal consultant at Mindset Matters, helps others align strategies for greater impact. Previously he was vice president and chief strategy officer of Avista Corp. He's chaired Edison Electric Institute's customer service executive advisory committee and was board president of the National Hydropower Association and the Northwest Gas Association.

Too many leave the pioneering to others and their future to fate by default rather than by design.

Progress toward greater value is stifled when short-sighted incumbents focus on defense of the status quo at the expense of their future. Odd as it seems, the Wright Brothers showed this sort of reticence to change, even with their new invention.

The self-reliant Wrights fought hard to secure their patents. But they did little else and didn't earn much as a result. After all, at the time of their invention, there was as yet no airline industry with customer demand to be met.

Compounding their market problem, the brothers held tight to the format that first worked for them. Others learned from them and diligently developed even better ways to achieve flight.

The potential of commercial flight was realized, just not by the Wrights. It seems the brothers lacked the business savvy needed to progress and were too slow to adapt.

Conversations the Wrights might have had with their investors in that time are easily imagined: "Trust us, we now know what works. Those competitors don't know what they're doing. Their ideas won't fly. There's no time. Changes at this point aren't worth it. We tried that already. Customers will come to us. Best if we stick to our knitting."

Excuses, excuses. You've probably heard them all. Plus a few more: "Customers don't care. That's not what we do. It isn't our core competency. The regulators won't let us."

How easily we can talk ourselves into mediocrity.

Consider the trajectory of electric energy, which has devolved over time to commodity status.

> **Too many leave their future to fate by default rather than by design.**

Like the Wrights' Flyers, electric energy was novel but not particularly relevant in the early days. Unlike the Wrights, Edison and other early pioneers in electricity worked to invent applications for using the invention.

Relevance joined novelty and boosted demand for more power and more applications.

For decades, electricity was valued for what it enabled. Work made easier, productivity greater, and connectivity better than ever. Policies and regulation followed, designed to attract investment and accelerate electrification for all.

Appreciation for the empowering effect of electrification declined as service became ubiquitous. These days, value is judged on reliability and cost of power delivered rather than what electricity enables.

Pioneers are reversing this trend.

New technologies combined in new ways create unexpected value. Novelty in the electric industry is on the rise. Which utilities will show the business savvy and adaptability to reclaim industry relevance?

Time will tell.

There's a false comfort in doing what's been done over again. The value chains we know are linear and manageable. The outcomes are predictable. Until they are not….

In contrast, creating what can be involves new thinking, intentional effort, and adapting from trial and error. Non-linear constellations of value are the new source of novelty and relevance.

This is especially true in industries such as electric utilities which are experiencing new technologies, new policies, and new consumer demands.

Little wonder then that the utility industry is a magnet for new entrants.

Pioneers are always anxious to achieve more. ❖

Jon Jipping

(Cont. from p. 15)

have facilitated the connection of nearly six thousand megawatts of renewable energy.

As a result, our systems are poised to enable the possibility of an energy future that incorporates a variety of generation sources. The critical role that transmission plays in connecting clean energy is clear. Our investments in transmission infrastructure across Iowa and Michigan have enabled wind farms to be optimally located, resulting in hundreds of millions of dollars in customer savings.

In the coming months and years, we hope to leverage our unique position to help start more conversations among all stakeholders about how to build smarter energy infrastructure, which means growth for everyone. Public power, regulators, legislators, utility partners, suppliers, technology leaders and, of course, customers will be part of the dialogue. The new infrastructure can help fulfill the promise of new technologies and enable diverse fuel sources to move Americans forward.

We all must stress the importance of electricity in the national infrastructure conversation. As well as the need for an electric grid that is flexible and resilient enough to handle everything we are throwing at it today and tomorrow. This translates to transmission infrastructure able to handle variable fuel sources, microgrids, energy storage and DC overlays – a grid that works for all Americans. ❖

Educating Decision-Makers on Managing Utility Risk

Preparing for Emergencies

BY KANSAS REPRESENTATIVE TOM SLOAN

During my years as a state representative, my policy work has benefited from my prior employment as an executive for a vertically integrated oil and gas company and an electric and natural gas utility.

As a legislator, I have had numerous opportunities to learn and serve. First, as a member of DOE, FCC, and EPA advisory committees. Also by hosting FERC and FCC commissioners and DOE and DOD assistant secretaries for summits with Kansas stakeholders.

I have visited a nuclear generation plant during shutdown. I have also visited coal and natural gas-fired generators, a carbon capture and sequestration pilot project, a live wire 345-KV line reconductoring, a utility-sponsored integrated "green" house, wind and solar farms, a river-run hydroelectric plant and more.

Not every state legislator has opportunities for such a comprehensive education.

Even more valuable than the site visits and briefings were several simulations and tabletop exercises sponsored by DOE and NARUC. The DOE's Alice Lippert hosted several emergency preparedness exercises in which disaster scenarios were postulated and participants developed plans to meet those potential emergencies.

Rep. Tom Sloan was elected to his 12th term in the Kansas House of Representatives. He serves on DOE, FCC, and EPA advisory committees and has hosted FERC Commissioners in Kansas. He focuses on energy, telecommunications, and water policy interactions in Kansas and nationally.

Some of the aspects of planning were relatively straightforward. For example, having an element of redundancy in the transmission grid or having the capability of shedding load so that customer choices are recognized.

Other aspects were more problematic. For example, what should be the priority for emergency generator fuel deliveries: who should come first? Hospitals, police/fire/EMS, utilities, others?

Each scenario required a prioritization of actions and the deliberate recognition of the associated economic and political costs. Even for a relatively simple choice, there are numerous aspects to be evaluated. Building redundant transmission capacity involves several decisions. Should there be one hundred percent, fifty percent, or some other amount of capacity redundancy? More than one pathway to provide the redundancy? Need to site new lines? Cost of redundancy and timeline to develop it? Impact on customer rates with political and litigation implications?

Further questions included how long will it take for utility employees from other communities or states to be mobilized and on-site? Where will the mutual assistance crews be housed and fed? What type of communications system will be necessary to coordinate the non-local teams' efforts? What happens if the emergency event eliminates local cellular phone service?

What's the priority for emergency fuel deliveries: who's first? Hospitals, police/fire/EMS, utilities, others?

The DOE model emphasized two points as an aid to making decisions. First, the probability that such an event could occur; second, the scope of consequences if the event occurs.

Utilities regularly engage in such deliberations out of sight of legislators. Perhaps it is time to change that situation. Not all utilities and communities will

experience a hurricane, but massive snow or ice storms, tornadoes, fire at a facility, natural gas supply interruption, or other situations can create an emergency.

Legislators, commissioners, commission staff and governors' staffs would benefit from a tabletop exercise to see how much pre-planning is necessary. They would explore how much planning and preparation for an emergency costs, and how utilities prioritize service restitution.

This is also an opportunity to discuss ratemaking issues related to emergency preparedness, service restoration, and the general issues related to system resiliency.

Miles Keogh at NARUC developed several tabletop simulations for PUC commissioners and legislators. They revolve around selecting the appropriate generation mix to meet public policy objectives. The exercises force participants to confront their policy preferences. For example, renewables at thirty percent penetration, DG/DR at twenty percent, or nuclear, and contrast them with the realities of generation costs and system reliability. There were obvious costs associated with building new natural gas generation. The costs associated with the need for transmission line capacity to deliver low cost high plains states' wind energy to East and West coast utilities were less obvious.

There are also decisions to make about retiring existing generation units as well as the timelines and investments needed to bring new generation online. Also, decisions regarding support for distributed generation and energy conservation programs.

There are economic and system operation costs of which policymakers are largely ignorant. They are associated with policy preferences such as high renewable penetration and system reliability. The NARUC tabletop exercise forces participants to make decisions about the mix of generation, DG, transmission, and other factors based on system costs and operational efficiencies. It forces policymakers and regulators to confront the consequences and opportunities of their policy preferences.

> **The risk assessment and planning process can be a valuable and, dare we say, fun educational opportunity.**

Cost of electricity to consumers is a key driver for participants in the NARUC tabletop exercises. System reliability, resiliency, and adequacy are tangentially addressed, but for policymakers, they probably need to be emphasized more.

Legislators can do more damage to the electric system through ignorance than through deliberate efforts. Educating us on the implications of our policy choices is essential if the utility's management hopes to guide policymaking.

While some legislators will accept information on the costs associated with utility planning and public policy decisions as valid, many will not. Engaging those legislators and commission staff members in real-world decision-making exercises can be very beneficial. Some utilities have included legislators, commissioners and staff in nuclear generation event scenarios that involve public safety officials from the state and local communities.

I have participated in such an event and came away with new respect for the coordination between the utility operator and public safety, media, and other partners. While not as extensive, the DOE or other risk assessment and planning process can be a valuable and, dare we say, fun educational opportunity. To that end, please consider:

Partnering with your PUC. Requesting a NARUC simulation team to visit your commissioners, commission staff, legislators, and governor's staff.

Contacting DOE and your state's emergency management team about conducting tabletop exercises for legislators, governor's staff, and commission staff.

Tailoring the tabletop exercises to address issues of specific interest or concern to your company or customers. For example, model the costs associated with promoting DG and DR or utility-size renewable generation within your state versus importing lower cost renewable energy from the Midwest or Southwest. Costs should include the direct cost of service to customers and the indirect costs of maintaining system capabilities, reliability, and resiliency.

As you partner with the DOE, NARUC, your commission and legislators, make sure that public officials understand that your concerns and theirs are the same. Everyone wants an affordable, reliable, resilient, environmentally responsible electric system. The key is to identify policies and economic opportunities to capitalize on the shared objectives. ❖

Happy Nikola Tesla's Birthday! The father of our alternating current system was born July 10, 1856. His last days in the fall and winter of 1942-43 were spent feeding the pigeons of Bryant Park in Manhattan. There, Sixth and 40th has since been called Nikola Tesla Corner.

Positioning for the Next Deal

Small Utility M&A Opportunities

BY GERRY YURKEVICZ

I haven't met a utility exec yet who does not like to make a big splash. I know what you are thinking: my team and I are pretty good at the utility mergers and acquisitions game when the opportunity arises! I know my peers in the executive suite, understand their motivations, study their parachutes, and talk with the bankers.

However, buying small may be different than buying big. Last month we talked about acquisition opportunities in the small utility segment. Oliver Wyman estimates that the acquisition potential is currently worth around fifteen billion dollars and capable of delivering more than seven hundred million dollars in annual earnings. Investors will need a different approach to buying small.

For larger utilities, investing in the small utility market should be an integral part of their development program. The deal synergies are, in most cases, natural and compelling.

In my view, utilities need to focus on three areas to have the best chance of success.

Get to know your target: You need to develop a thorough understanding of potential smaller utility targets so that you can act quickly and decisively when an opportunity arises. Senior management should forge close relationships with their counterparts in smaller organizations. Utility execs tend to stick with their bigger buddies.

It's never too early to talk with regulators: You should lay the groundwork with regulators by understanding customer, business and regulatory issues facing smaller targets. Informally test the waters with regulators as early as possible.

Build internal acquisition capabilities: making smaller deals work takes time and careful planning. An experienced team and great internal processes can help to speed up your ability to be proactive and cost effective with smaller deals.

It's true that larger utilities generally have a competitive edge over other investors when it comes to investing in smaller utilities. However, there are tactics that non-utility buyers such as infrastructure funds and private equity firms can use to improve their prospects.

Waiting for the next deal to come from banks isn't the best strategy for private investors. I believe they should develop targets proactively by sifting the market for the right opportunity to tease out a deal. There are a number of unique and special utility acquisition situations in the market right now that require legwork, but could yield a good outcome for the committed buyer.

The more proactive you are, the more successful you're likely to be.

Investment managers should also look for markets where they are likely to have a distinct advantage because utility buyers may be constrained from participating. There may be local issues relating to customers, rates, regulation or jobs.

A buyer will have to pay at least market to secure the right deal. Premiums can be justified by a combination of thorough pre-acquisition planning and analysis, and by putting in place a strong management team that's motivated by the right incentives after completion.

While these specific tactics can certainly help to enhance any buyer's prospects, there is a simple truth to accept: The more proactive you are, the more successful you're likely to be in the small acquisition game. ❖

Gerry Yurkevicz is a partner in the energy practice at Oliver Wyman, focusing on utility strategy, mergers and acquisitions, performance improvement, and transformation.

Chris Gould a Likely Top Forty Innovator

We first met Chris Gould when he participated in our roundtable, "The Power of Innovation." The roundtable, which we published in January's and February's PUF, included Chris as well as innovation officers of Duke Energy, Oncor and Southern Company, and a former innovation officer of Edison International.

See pages 22 through 31 of January's PUF, and pages 28 through 37 of February's PUF.

Chris has three titles at Exelon. He is senior vice president for corporate strategy. He is chief sustainability officer. And, if those aren't cool enough for you, he is the chief innovation officer.

We ran into him again at the recent and mammoth Innovation Expo. Nearly three thousand utility employees converged in Washington to compete for prizes for the most promising innovations.

This remarkable event, celebrating the creativity and passion of thousands of people at this not-stodgy utility, is highlighted in August's PUF. Check out the extensive cover article with interviews, pics and video.

One of the interviews is with Chris. You need to give it a read. Chris is part curator – part impresario of innovative ideas, initiatives and implementation.

Chris graduated Penn State in 1993 with a BS in civil engineering. He surely can handle stresses. He was a senior engineer in the nineties with EA Engineering, Science and Technology and with

Chris is part curator – part impresario of innovative ideas, initiatives and implementation.

URS Corporation. He next picked up an MBA at Pitt.

That's when he joined Exelon in the Philadelphia area. First as a senior analyst, then Chis was manager for fundamental analysis for the Power Team – a neat title, then director for financial planning, and then director for pricing/structuring.

He became a vice president in 2008, for corporate financial planning. Two years later he was made senior vice president for corporate strategy, his current gig.

Seems to us that Chris is a likely Top Forty Innovator. In November's PUF, as we've announced, we'll publish our new annual list, the Fortnightly Top Forty Innovators.

As we've said, everyone making the Top Forty will have distinguished themselves during the last year, serving the

Chris Gould, right, at "The Power of Innovation" roundtable, with Bert Valdman, left, formerly chief strategy officer of Edison International and presently CEO of Optimum Energy.

public interest. Invented costless clean electricity generation? That would do it.

Or you could have developed or advanced the adoption of a technology, application, method, regulatory approach, or public policy that has the potential to serve the public interest. Understanding that such projects are predominantly the product of groups of people, rather than lone wolves like Nikola Tesla, a nominee can be an organizational or project leader that urged and stirred action and achievement.

The Top Forty issue in November will be a big deal. Interviews. Photos. Audio. Video. It will highlight some of the most outstanding leaders in our field. Like – perhaps – Chris Gould. ❖

Great Commissioners I've Known

BY STEVE MITNICK, EDITOR-IN-CHIEF

My career in utility regulation and policy, now thirty-nine years in duration, has been enriched by hundreds of friends. They were thoughtful and passionate about the public interest. They were funny and kind. Usually they had all these traits.

Many of them were great commissioners. I started to list them. But the list soon got out of control.

I then limited the list to retired commissioners. This was hard. We're fortunate to have this many great currently-serving commissioners.

I then further limited the list to retired commissioners that I've worked with substantially. This was hard too. It made the list manageable, sure. But it also forced me to leave out so many glorious people.

Of the remaining twenty-five, six of them have worked at consultancies with me. After they served as commissioners of course. Indeed, I hired three of them. And I retained three more of them as lawyers or consultants. And one of these great people hired me, while she was a commissioner. It was my first big break as an expert witness for staff.

Of the remaining fifteen on the list, we generally collaborated on projects and common interests, or just talked a lot at NARUC gatherings. When a Winter, Summer or Annual Meeting approached, I looked forward to seeing them again.

Here's the list. Dear friends omitted below, please forgive me. I miss you as much.

NARUC president Rob Powelson, left, and executive director Greg White, right. Rob, a member of the Pennsylvania Utility Commission, has been nominated to serve at FERC. Greg was formerly a member of the Michigan Public Service Commission.

Vicky Bailey, Indiana Utility Regulatory Commission and Federal Energy Regulatory Commission
Mike Banta, Indiana Utility Regulatory Commission
Ashley Brown, Public Utilities Commission of Ohio
Paul Centolella, Public Utilities Commission of Ohio
Charlie Cicchetti, Public Service Commission of Wisconsin
Tony Clark, Federal Energy Regulatory Commission
Lisa Crutchfield, Pennsylvania Public Utility Commission
Terry Fitzpatrick, Pennsylvania Public Utilities Commission
Bill Flynn, New York Public Service Commission
Craig Glazer, Public Utilities Commission of Ohio
George Hall, Federal Power Commission
Maureen Helmer, New York Public Service Commission
Jim Hoecker, Federal Energy Regulatory Commission
Wendell Holland, Pennsylvania Public Utility Commission
Joe Kelliher, Federal Energy Regulatory Commission
Phil Moeller, Federal Energy Regulatory Commission
Phil O'Connor, Illinois Commerce Commission
Paul Roberti, Rhode Island Public Utilities Commission
Bob Rowe, Montana Public Service Commission
Ron Russell, Michigan Public Service Commission
Marc Spitzer, Arizona Corporation Commission
Charlie Stalon, Federal Energy Regulatory Commission
Bill Steinmeier, Missouri Public Service Commission
Branko Terzic, Public Service Commission of Wisconsin and Federal Energy Regulatory Commission
Patricia Worthy, District of Columbia Public Service Commission

A handful of you will be in San Diego for the NARUC Summer Meeting. See you there. As for the rest, you know where to find me, at Public Utilities Fortnightly. Drop me a line. ❖

Electricity can be fun! Here's the cool Gundam anime statue, a tourist favorite, in front of a shopping plaza on Odaiba, a man-made island in Tokyo.

PUBLIC UTILITIES FORTNIGHTLY
"In the Public Interest"

EXECUTIVE EDITOR
Bruce W. Radford
radford@fortnightly.com

EDITOR-IN-CHIEF
Steve Mitnick
mitnick@fortnightly.com

EDITOR-AT-LARGE
Pat McMurray
mcmurray@fortnightly.com

EDITOR
Angela Hawkinson
hawkinson@fortnightly.com

LEGAL EDITOR
Phillip S. Cross
pcross@fortnightly.com

PUBLISHER
Joseph D. Paparello
paparello@fortnightly.com

ART DIRECTOR
Michael Eacott
eacott@fortnightly.com

CIRCULATION
Teela Wormley
twormley@fortnightly.com

EXECUTIVE MANAGEMENT
Bruce Radford, President; Phillip S. Cross, Vice President; Lewis Turner, Treasurer; James Norris, Secretary

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USEA
United States Energy Association

10TH ANNUAL ENERGY SUPPLY FORUM





USEA will hold its 10th Annual Energy Supply Forum at the National Press Club in Washington, D.C. This annual gathering will bring together the country's top energy industry and policy leaders to examine the current state of energy exploration and production, electricity generation, and global and domestic fuel supply. Mark your calendar for this important event. Full agenda coming soon!

JULY 27, 2017

THE NATIONAL PRESS CLUB ◆ WASHINGTON, DC

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