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Wires Cos. Plug In to CPP

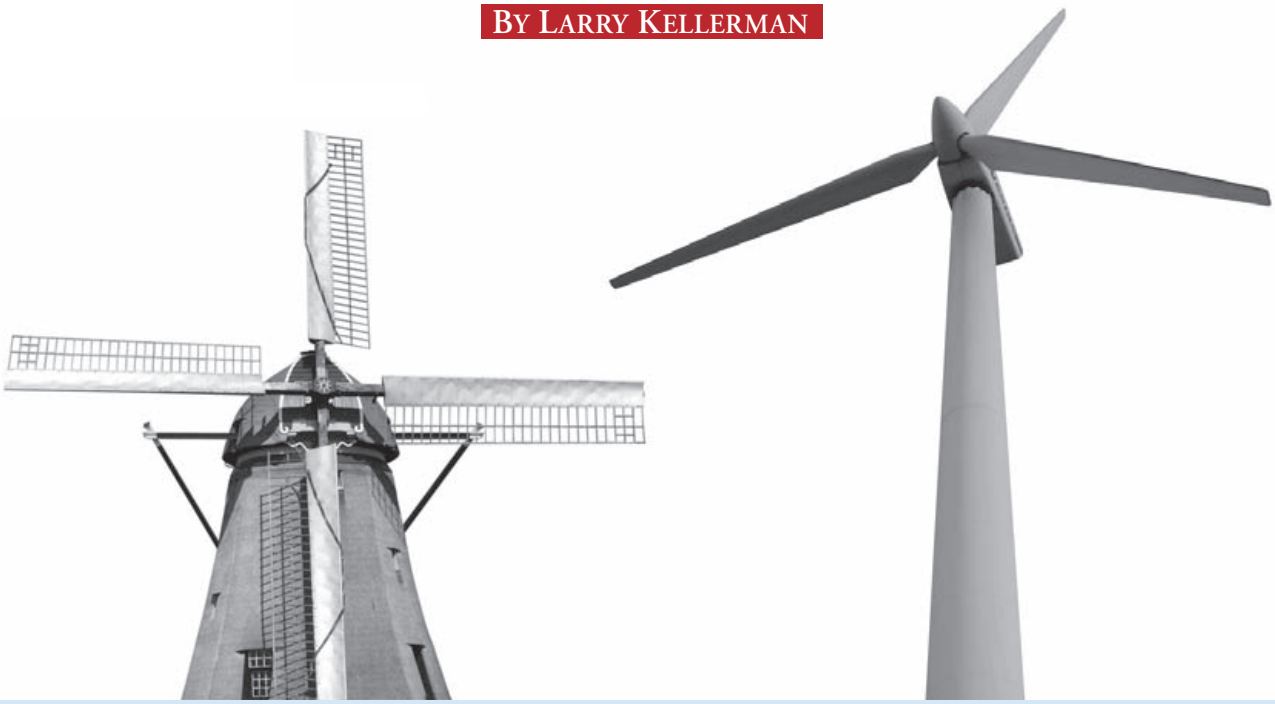
Reinvigorating Biz Model

At APPA Legislative Rally

Reinvigorating a Century Old Business Model

The Power of Efficient Capital

By Larry Kellerman



From Pearl Street Station to the solar array deployed on your roof. The common theme and challenge that the electric power industry has faced over the years is how to deploy massive volumes of capital to efficiently supply affordable energy to society.

That remains a challenge that the electric utility industry is quite capable of addressing. And in so doing, both perpetuating the industry's business model and enhancing its ability to serve customers.

By embracing the time-tested regulated construct and adapting it to enhance the relationship with the people we serve, utilities can enter a new era of growth and rejuvenation. We can have a clean, networked, and dynamic ecosystem of energy production, delivery, management and consumption. Customers don't have to wait decades while the grid incrementally evolves to incorporate transformational technologies. Led by customer-driven choices and decisions, we in the utility industry can and should accelerate that transition.

To provide a backdrop for this forward-looking utility model, it helps to look back into the industry's history to gain important insights about how we got here.

Past As Prologue

Over a century ago, in 1912, a clean, low cost, and domestically generated fuel supplied the pumping, milling, sawing and a host of other industrial and domestic needs for much of North America. It was the wind blowing across our country's vast heartland.

As electrification took hold, these wind turbines were synched up with new electric generators to further enhance their prodigious capability. We may view wind energy today as a success story with 50,000 turbines spinning in the USA, but in 1912 there were 120 times that – about 6 million.

That year, if a Fortune 500 ranking of the largest industrial enterprises in America had existed, the US Wind Engine Company would have been high on that list. It was the pre-eminent American manufacturer of wind turbines and had been a true technological innovator over its entire history.

In the 1912 annual report, the company's president wrote:

"As long as the wind continues to blow across the hills and plains of this vast country, our company will continue to grow and prosper."

Then, only a few years later, it had closed over half of its production lines. A decade later, it went under. What happened?

Around that same time, Chicago Edison, a tiny electric utility company, was struggling to survive in a local industry that included twenty-seven competitors. To grow and become profitable, the company had to lower its price.

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Great technological advances can only make great contributions if attached to a commercial structure that enables customers to say yes quickly.

But this was a high-cost industry consuming huge amounts of capital. That's when innovation struck.

If they could sign up customers over the long haul, they might get banks to lend money at attractive rates and then use those low financing costs to drop the price of their product. Still, they needed something else to entice the banks.

In order to secure that cheap financing, they needed to partner with the State of Illinois. They needed a guaranteed territory in exchange for a guaranteed limit on profits. In other words, they needed to get themselves regulated.

Regulation became a positive, constructive and transformational point of inflection for the electric industry. It enabled the utilities to achieve what no other energy company had thought to do: finance the business with low cost, permanent capital so customers didn't have to pay up-front. They could access low-cost investment grade debt and ample supplies of transparently priced equity to finance all of their customers' energy needs.

Meanwhile, a customer who wanted to install a windmill had to pay the US Wind Engine Company or its competitors and vendors for the full capital and installation cost. And it had to pay it up-front out of cash reserves.

The old model was no match for companies that adopted Chicago Edison's killer app. The US Wind Engine Company was too slow, collapsing even as the wind kept blowing across the plains.

It's All About Commercial Structure

There is a universal business lesson here. Great technological advances can only make great contributions to society if they

are attached to a commercial structure that enables customers to say yes quickly and in large numbers.

Wind wasn't killed by fossil fuels. But rather by a commercial business model that allowed customers to say yes, both rapidly and at scale.

Here and now, we in the energy sector still operate in the most capital-intensive business on earth. If we want mass adoption of new energy technologies, we need a new commercial model to allow customers to say yes in large numbers. Such a model is arguably more important than the technologies themselves.

We need a new commercial model that empowers and enables customers to meet their energy needs cost-effectively from among the wealth of available energy resources. And it must achieve this with the same ease they currently enjoy when power is delivered by their local utility to an outlet in their home from a distant power plant.

> "This reinvigorated model introduces individual-level customization – a million customers can have a million different rate bases."
>
> *– Larry Kellerman*

Over the past century, energy needs have changed. In our digital world, customers will not tolerate and cannot afford outages. We know now that customers don't use electricity identically. One-size doesn't fit all. Doing more with less energy is an appealing equation to most. Many customers also want energy from resources that don't harm our planet.

We need a new commercial model to make the ownership of distributed solar projects affordable for all of society. And paid for the same way you pay your electric bill every month.

We need a new commercial model that allows vehicle manufacturers, working with electric utilities and power suppliers, to offer a single blended price for the vehicle and all of the electric fuel. With the total cost being comparable to the cost of conventional vehicle operation and fueling.

Reinvigorated Regulated Model

The model I've just described is not a distant ideal. It is feasible today.

We call this the "Million Rate Base" construct. But whatever one calls it, we are talking about a natural evolution and reinvigoration of the model pioneered a century ago in Chicago.

Regulated utilities can again enable customers to say yes in large numbers, allowing them to accrue their own energy producing and energy saving assets. While we continue to support the traditional rate base model for grid level investments.

Utilities can do this by matchmaking capable vendors with interested customers. And then financing their purchases at the utility's cost of capital.

We can collaborate with specialized vendors – proven experts in providing residential solar panels, community wind turbines, energy management systems, energy efficient appliances, and a wide array of transformational energy technologies – to find the very best options available today and in the future. Then we can challenge those vendors through competitive processes to offer goods and services to our customers at the lowest possible cost – without a markup.

Likewise, regulated utilities can pass along a very low cost of capital because we can raise capital at a very low cost and finance products cheaply. Under this model, utilities will voluntarily use the same regulator-approved cost of capital for these products as for traditional grid-based investments.

Letting Million Flowers Bloom

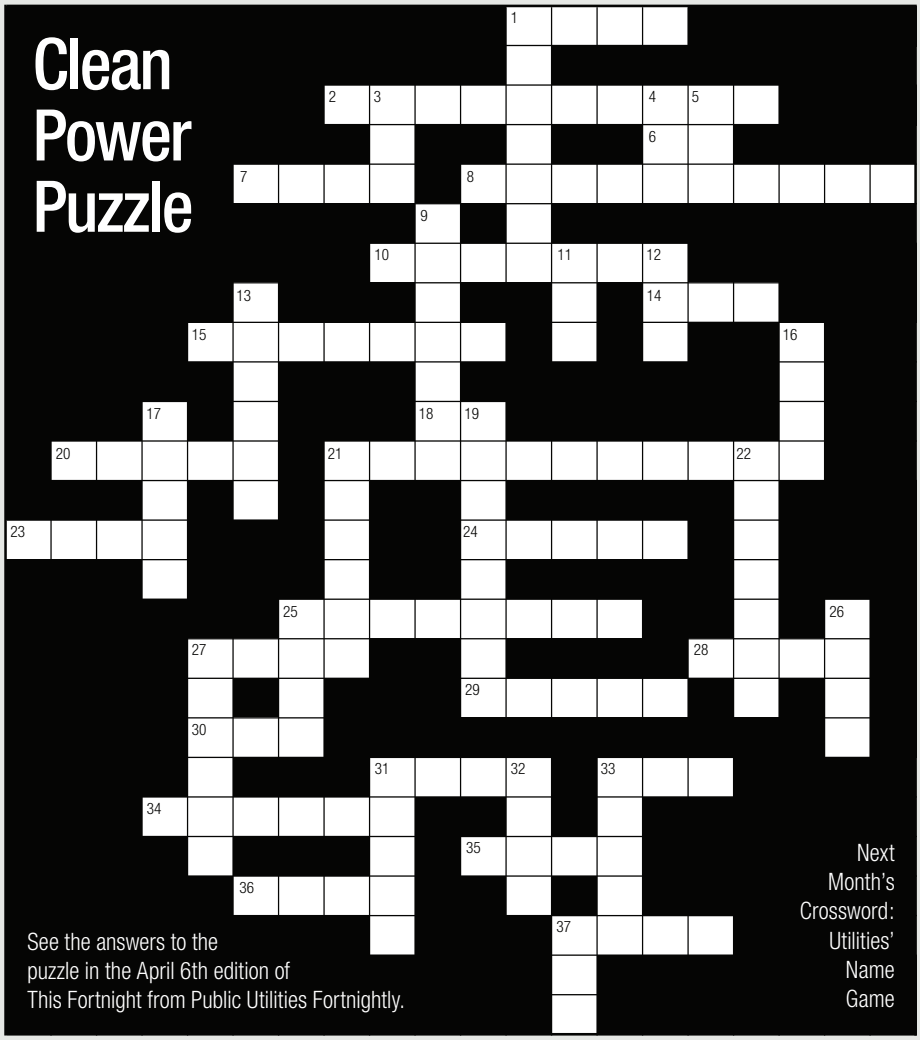
Critically, this reinvigorated model introduces individual-level customization – a million customers can have a million different rate bases. It allocates the cost of each customer-facing asset to the individual who ordered it via that customer's monthly utility bill.

Our regulated utilities can empower customers to select solar or wind, to produce and manage their own energy. Or to reduce their energy costs and environmental impact with new technologies.

In the past – and frankly, looking at today's environment, in the present too - only consumers with significant financial means could acquire innovative but expensive energy technologies. Even when vendors have offered leasing programs, the financing terms were far more expensive than a utility's cost of capital and only available to customers with high credit ratings.

Moreover, the vendor has generally owned the assets at the conclusion of the lease term, not the consumer. Consumers need a much better and more transparent deal in order to say yes.

Under the rejuvenated regulatory construct described here, a customer who wishes to purchase, for instance, the latest energy efficient HVAC system, solar panels or energy management system would turn to their local utility for the best deal. After the contract period, with the asset totally amortized within the "rate



Across

1. reliable critic
2. more with building block four
6. assessment
7. incentive program
8. more with building block three
10. skeptical judges
14. more with building block two
15. not changing the _____
18. first letter of CPP
20. it's up to each _____
21. EPA's favorite word selling CPP
23. state target
24. _____coal generation to gas
25. MATS case lead plaintiff
27. war on _____
28. not mass-based
29. path to 2030
30. state standards
31. best diet system
33. where to read CPP
34. _____cost of carbon
35. efficient gas-fired plant
36. skeptical commissioners
37. continuous stack meter

Down

1. baseload that gets no respect
3. state takes a pass
4. 111(b)
5. 1970 act
9. environmental _____
11. McCarthy's agency
12. regulated plant
13. one _____(d)
16. Supremes said
17. head start action
19. not new plants
21. disliked fuels
22. plants that get hot
25. not rate-based
26. lower with building block one
27. emissions hurt planet
31. four for building, but now three
32. cap & trade in northeast
33. combined _____
37. like fric & frac, _____& trade

base," the customer would own the asset at no additional cost.

Additionally, the model enables companies across many industries to access bottom-line benefits. The new financing capability offers access to sophisticated energy management systems to control energy consumption and reduce costs.

Better For Each Customer, Better For All

This kind of model isn't just better for customers; it's better for the system. Rooftop solar panels, smart thermostats, energy management systems, electric vehicles and other technologies will multiply and diversify in a manner that alters the entire electric supply and delivery landscape.

The grid will become more efficient and cleaner, supplying local loads from energy resources at or near the point of consumption, reducing energy losses while retiring inefficient centralized resources such as coal-fired power plants over time. Grid infrastructure will harden to increase reliability, resilience and security via interconnected microgrids that disconnect and continue to operate independently in the event of a power outage.

This model also virtually eliminates the problem of overinvestment and asset write-downs in the electric utility industry because it greatly reduces the need for utilities to accurately predict loads well into the future. It means fewer large scale, difficult to manage, and often contentious construction projects.

Small generation projects are easy to manage and are significantly lower risk investments. When cost overruns occur in this

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Electricity, Efficiency and Growth

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these investments through an allocation of a crude oil tax eliminates divisive posturing and circular arguments about who can, will or should pay.

Electricity customers pay taxes and consume transportation and communications services. In a mature developed economy, there are few opportunities in history to impose a vision that will benefit everybody.

Building transcontinental railroads, providing universal access of telephone service, rural electrification and building the interstate highway system are examples of transformational infrastructure investments. Building a fully integrated grid for North America is the next great opportunity to realize higher levels of economic efficiency and prosperity by increasing the competitiveness of the domestic economy. PUF

Endnotes:

1. Cost benefit analysis in the electricity industry has been taken up in industry studies sponsored or conducted by the Electric Power Research Institute. See particularly, Logan, Douglas, Murty Bhavaraju, Roy Billinton, and David Garrison, (1990), *Cost-Benefit Analysis of Power System Reliability: Determination of Interruption Costs: Volume 1: Measurement Methods and Potential Applications in Reliability Cost-Benefit Analysis*, EPRI EL-6791 and Electric Power Research Institute (2014) *The Integrated Grid; Realizing the Full Value of Central and Distributed Energy Resources.*
2. Cost benefit analysis has been an area of economic theory and practice for almost fifty years but has not been effectively applied in regulatory decisions affecting electrical system infrastructure investment. The challenges of implementing this approach are described in: Mishan, Ezra and Euston Quah (2007) *Cost-Benefit Analysis*, 5th Edition, Routledge, New York, New York.
3. Data for 2012 industrial transactions taken from: IMPLAN Group LLC., IMPLAN System (data and software) 16905 Northcross Drive, Suite 120, Huntersville, North Carolina, 28078, www.implan.com.
4. All Federal investment and public spending data are taken from statistical resources of the General Accounting Office, 2013, *Federal Investment*, December; www.cbo.gov/publication/44974.
5. This diverse set of programs is detailed in Kirk, Robert S., (2013) *Federal-Aid Highway Program (FAHP)*, Congressional Research Service 7-5700, R42793, December.
6. The features of this tool are described in Bent, Russel, Loren Toole and Alan Berscheid, (2012). Transmission Network Expansion Planning with Complex Power Flow Models, *IEEE Transactions on Power System*, Vol. 27., No. 2, April.
7. Impulse response functions are an econometric technique used to describe the dynamic economic effects of transportation infrastructure investment. See: Leduc, Sylvain and Daniel Wilson, (2012) *Roads to Prosperity or Bridges to Nowhere, Theory and Evidence on the Impact of Public Infrastructure Investment*, Federal Reserve Bank of San Francisco, Working Paper Series 2012-04, June. Our approach employs regional economic impact assessment models to estimate an impulse response based on characteristics of infrastructure investments by type.

Reinvigorating

(Cont. from p. 27)

context, they measure in the hundreds or thousands of dollars, not multiple billions. This model also produces jobs – local jobs in the communities purchasing the services.

The kind of commercial innovation that killed wind is exactly what can bring it and an array of other clean, cost-effective energy producing and energy saving technologies back in full force. Along with a huge array of new technologies available now and those we haven't even dreamed of yet.

A model that promotes mass financing with granular customization will accelerate the natural market processes and rapidly evolve us toward the energy future our customers want. History tells us that when customers can say yes in large numbers, the business winds shift quickly. PUF

Rethinking

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analysis, but with the logarithm of energy usage as a dependent variable. Other options have been proposed which have more complex implementations.

Call for a New Standard

It's time for a new standard for measuring behavioral savings specifically targeted towards small business populations. All parties involved at the front end of program design should be carefully assessing how they'll measure savings for this group of customers. Greater visibility into actual program performance may reveal significant untapped savings and economic opportunities that could be realized through more behavioral programs for smaller businesses. PUF