

# How Wellinghoff, Rabago, and other grid reformers would design their own electricity markets

## SEPA asked stakeholders to design the "51st State." Here's a rundown of the non-utility contributions.

By [Gavin Bade](#) | April 9, 2015

For the past few months, the Solar Electric Power Association (SEPA) has been collecting submissions for the 51st State project, an initiative that brings together stakeholders from across the industry to lay out their ideas for a new energy market in a hypothetical 51st state.

Last week, Utility Dive highlighted the [submissions from the utility sector \(http://www.utilitydive.com/news/how-aps-appa-and-nreca-would-design-a-blank-electricity-market/380795/\)](http://www.utilitydive.com/news/how-aps-appa-and-nreca-would-design-a-blank-electricity-market/380795/), with proposals from from Arizona Public Service, the National Rural Electric Cooperative Association, and the American Public Power association.

Today, our analysis focuses on the “grid reformers” — non-utility stakeholders who submitted proposals aimed at reshaping energy markets. By and large, their proposals call for more transformative changes than their utility counterparts.

All 12 proposals are available to read in full on the SEPA [51st State website \(http://www.sepa51.com/submissions.php\)](http://www.sepa51.com/submissions.php). Our focus today is on the two of the most detailed proposals from well-known grid reformers, particularly their ideas on the role of the utilities and their regulators.

### Wellinghoff, Tong & Hu: The ‘Transactive Energy’ framework

You may recognize the names of Jon Wellinghoff, the former FERC chairman and now a partner at Stoel Rives, and James Tong, vice president of strategy and government affairs at Clean Power Finance. The two have become the patron saints of sorts for the Independent Distribution System Operator (IDSO) model, which advocates for an independent grid operator on the distribution system.

Wellinghoff, Tong, and Jenny Hu of Vivint expand on the [IDSO model \(http://www.utilitydive.com/news/jon-wellinghoff-utilities-should-not-operate-the-distribution-grid/298286/\)](http://www.utilitydive.com/news/jon-wellinghoff-utilities-should-not-operate-the-distribution-grid/298286/) in their proposal for the hypothetical state of "Welhuton," advocating a [transactive energy \(http://www.utilitydive.com/news/jon-wellinghoff-utilities-should-not-operate-the-distribution-grid/298286/\)](http://www.utilitydive.com/news/jon-wellinghoff-utilities-should-not-operate-the-distribution-grid/298286/) framework for the state. That model envisions the grid like a network “not unlike the Internet, stock market, or

our capitalistic economy,” with millions of actors each day making value-based energy decisions on a “plug-and-play” grid with multi-directional electricity flows.

Under that framework, the transmission and distribution networks would act as marketplaces — “platforms on which customers more freely choose providers and technologies,” as the authors put it. Regulated utilities would retain ownership of the transmission and distribution infrastructure as they are, in the words of the authors, “the only aspects of the electric system that are truly natural monopolies.”

To protect utilities from undue risk, power generation and retail services would be deregulated and competitively sourced. In other words, regulated utilities would not own any generation or distributed energy resources directly.

Under the model, utilities would relinquish day-to-day control of grid operations to the IDSO, which, along with the utility, would be under the jurisdiction of state regulators. The IDSO would be responsible for maintaining safety and reliability, providing open access to the grid, promoting market mechanisms and overseeing the optimal deployment of distributed energy resources (DERs).

Utilities would still be governed by traditional cost-of-service regulation, and would have to go to regulators as they do today to propose grid upgrades. But if they wanted to own generation or DERs, they would have to do it through unregulated subsidiaries, and not the regulated utilities themselves.

The authors acknowledge that utilities would likely object strongly to divesting from generation and relinquishing operational control, but they say it is a sacrifice they would have to make for the greater good of the system.

“Power generation is a highly lucrative business, involving huge multi-billion dollar infrastructure investments. But the same reasons that make them financially rewarding also make them financially risky,” the submission reads. “Allowing utilities to continue to rate base generation would impose inordinate risks on ratepayers. The same conditions would apply if distribution businesses were allowed to make competitive investments in DER.”

But far from getting rid of utilities, the authors believe their model will actually open new opportunities for them. By legally separating the regulated, risk-averse transmission and distribution utility from its unregulated, risk-taking subsidiaries, utility holding companies will be able to obtain fairer valuations for both, the authors claim. Holding companies will be able to obtain predictable returns from the regulated businesses, but if they want a taste of riskier endeavors, they can always set up unregulated subsidiaries.

However, the authors stress: “No revenues, information, brand, personnel or any other

aspects of a monopoly business can be used by the competitive business and vice versa. In fact, the only link between the two subsidiaries should be that they are owned by the same utility holding company.”

Grid investment and operational decisions in Welhuton would be based on transactive energy tariffs, derived from forward and spot power prices. Customers looking for power would need to buy a forward tender for the desired amount of electricity, including electric delivery and grid costs. Any discrepancies between that amount and what is actually consumed would be settled on the spot markets.

“The energy network’s TE tariffs internalize the system-level impact of each energy transaction; hence, these tariffs prevent unfair cost-shifting to others, particularly vulnerable segments, when others adopt DER,” the report reads. “The system-level costs of engaging in DER transactions will be built into the pricing of those DER transactions.”

The authors predict that the system of spot and forward prices will resolve the debates over net metering and the value of demand response because customers will be able to choose their electricity providers. If they feel that there is unfair cost shifting going on, they can simply switch to another company where that’s not the case.

“In short, market discipline will prevent *unfair* cost-shifting,” the report reads. “Providers who do not adequately price value and cost in accordance with customers’ needs and perceptions will lose business.”

Wellinghoff, Tong and Hu realize their vision is a transformative change for most energy systems across the United States. But if policymakers are looking for ideas to bridge the gap, the authors suggest they start with something like New York’s [REV initiative](http://www.utilitydive.com/news/all-about-the-rev-how-and-why-new-york-wants-to-develop-distributed-energy/370536/) (<http://www.utilitydive.com/news/all-about-the-rev-how-and-why-new-york-wants-to-develop-distributed-energy/370536/>).

“Distribution utilities can temporarily host the DSO (distribution service operator) under strict standards of conduct until the independence can be established,” they wrote. “Consumers can be given inducements over time to switch to more efficient pricing mechanisms. We welcome the opportunity to discuss these solutions in further detail.”

### **Rabago & Kennerley: The “Sharing Utility”**

If you have been following the rooftop solar boom, you will likely recognize Karl Rabago, now the executive director of the Pace Energy and Climate Center. Rabago, a former Texas utility commissioner and Austin Energy executive, helped develop the nation's first value of solar tariff for Austin Energy. He and Jim Kennerly, now the principal analyst at Sustainable Energy Advantage and formerly a senior policy analyst at the NC Clean Energy Technology Center, submitted a proposal for a “bottom-up”

energy system they are calling the “shared utility.” The idea is to replicate the model of consumer empowerment in the sharing economy — think Uber — in the power sector.

Just like in the transportation industry, where companies like Uber have disrupted the taxi monopoly, the authors see the same happening with DERs on the power grid. This will encourage more market-based approaches to utility operations rather than “the top-down style planning of the 20th century,” according to the authors.

A well regulated “sharing utility” would do three things:

*Shift market surplus downstream to customers ... utilizing a robust, locally integrated resource planning process, and provides transparent price information determining short, medium, and long term planning cost values for marginal distribution capacity and energy.*

*Set performance standards that reward optimization of several factors, including short and long-term prices, environmental responsibility, customer satisfaction, grid reliability and service quality standards (especially for service to low-income customers), and minimization of revenue requirement.*

*Encourage third-party participation in provision of services rather than the exercise of market power, operating essentially as an "independent distribution system operator." Much like other companies in the sharing economy, the sharing utility is an entity compensated not simply based on expected throughput, but on performance, service, and the ability to leverage private market assets and solutions.*

To get there, Rabago and Kennerly take the reader on an extended anecdote from their imaginary state Midlandia, which sounds a bit like New York. After being hit by Hurricane “Cindy,” the nuclear-heavy state embarks on an adventure to reform their grid and utility business structures.

After a lengthy negotiation process with stakeholders, Rabago and Kennerly — posing as consultants for the hypothetical state — propose a list of five principles for their new regulatory construct.

The first principle is that “the full impact of electricity generation, delivery, and use on natural systems ... must be accounted for.” In practice, that means a price on carbon. Wellinghoff, Tong and Hu proposed this in their submission as well; none of the utility sector proposals did.

“In many ways,” the authors write, “pricing carbon provides the clearest and most helpful market signal to utilities, given that a clear pathway for a carbon price would give utilities and independent power producers a far greater degree of long-term certainty with regards to their generation choices, and allows them to fully invest their time in programs and options that provide their customers with means to mitigate costs.”

Rabago and Kennerly’s second principle is that traditional cost-of-service regulation should be largely exchanged for “value-based pricing of the functionality of unbundled

services. The traditional model would be left only for those services that meet the definition of a natural monopoly."

Utility regulation today, the authors write, is largely based on the idea that all the components of the electricity system, from the power plant to the meter, represent a natural monopoly where a single supplier can provide the least cost. In many states, that label has been shed for generation, but with the advent of DERs, that moniker no longer applies to the distribution system either, according to the authors.

"[W]ith the rapid development of both metering and communications technologies, including cloud-based infrastructure utilizing open-API systems, many traditionally monopoly service components, like metering and other downstream distribution infrastructure, can be handed over to competition," Rabago and Kennerly write.

The third principle is that "every new regulated system asset has to prove its economic value to society ... on a full life-cycle accounting basis." That means that utilities and regulators would have to look harder at possible negative externalities of any potential investment. The authors suggest the sharing utility adopt integrated resource planning techniques, extend valuation methods designed for DERs to other resources, and implement risk-adjusted discount rates that "can improve assessment of disparate resources."

Fourth, the authors believe that electricity pricing in Midlandia should allow for a larger array of choices, and "reflect the full, location- and time-sensitive long-run marginal cost (LRMC) of utility service. Price structure need not mimic cost structure."

This feat would be especially difficult, the authors say, because Midlandia, like most other states, only has two tiers of utility pricing — one for the regulated utility and one for non-utility generators. Making matters more difficult, regulators tend to make rates using "embedded cost" methods for traditional generation that heavily rely on what the authors say is an imprecise averaging of costs. In contrast, they use "avoided cost" methods for DERs. That doesn't allow for location- or time-specific pricing because all utility customers are aggregated — and their individual needs and consumption are disregarded.

To change that, Rabago and Kennerly propose a number of fixes, including "segmenting customers into a more granular matter," enhancing utility sharing of customer power data, and establishing long-run marginal cost for "all the unbundled components of service."

Lastly, Rabago and Kennerly's fifth principle is that utilities should provide customers with "full and fairly-priced access" to DERs. Unlike the Wellinghoff & Tong proposal, utilities would have the option to own, operate and rate base investments in DERs — they would just have to prove to regulators that the market situation constitutes a

natural monopoly. In situations where the utility could not prove it should be owning DERs, the authors say “utilities can propose programs to encourage the development of private market solutions in the most cost-effective way possible that creates the greatest net benefit to customers.”

If and where utilities are not the owners of DERs, the authors advocate for a policy framework that allows utilities to “collect a share of the net savings (plus a performance incentive, if desired) from DER products and services that it can incentivize through distinct programs, but would have delivered and owned by private market actors.”

This scheme, Rabago and Kennerly write, is quite similar to the way utilities have been investing in energy efficiency and demand side management programs already, although it is seldom used for DERs. Rabago and Kennerly believe it would lead to enhanced deployment of DERs. As fuel prices rise and carbon prices are instated, the avoided cost of clean-energy DERs will rise, making them more lucrative.

### **Other proposals—and the road ahead**

Many of the remaining submissions share some of the same ideas with the proposals described in this article.

America’s Power Plan offered up a proposal that updates James C. Bonbright’s [ten principles for electricity ratemaking \(http://www.amazon.com/Principles-Public-Utility-Rates-Bonbright/dp/0910325235\)](http://www.amazon.com/Principles-Public-Utility-Rates-Bonbright/dp/0910325235) for the 21st century. The group’s proposal is quite thorough, but it punts on the critical issue of who should operate the distribution system. Instead of advocating outright that utilities should be required to relinquish operation of the distribution grid to an independent body, the authors write that the 51st State should simply consider both options.

John Farrell of the Institute for Local Self Reliance offered up an updated and revised proposal for his “energy democracy” framework, which Utility Dive [outlined \(http://www.utilitydive.com/news/how-power-companies-can-get-to-utility-20-and-beyond/342629/\)](http://www.utilitydive.com/news/how-power-companies-can-get-to-utility-20-and-beyond/342629/) back in December. That proposal seeks to get utilities past the “2.0” business models and to a place where localized needs and desires for electricity service — enhanced DER deployment, for instance — are met in a bottom-up, democratic fashion by electricity service providers of all stripes.

In one of the more offbeat proposals, James A. White, Director of Engineering at Texas A&M University, offers up an idea for a 100% solar-powered state. Drawing on both large-scale utility solar plants and an expanded rooftop solar fleet for power, the grid would utilize multiple types of energy storage to save intermittent generation for later use. These would include not just utility-scale and behind-the-meter lithium ion batteries, but also EV batteries, more pumped storage, and utility-scale “electrochemical storage batteries such zinc-bromine or vanadium flow

batteries.” White believes the cost of storage can fall quickly enough to make a 100% solar-powered state a reality.

What may be most striking about the 51st State proposals is the gap between the utility sector and the grid reformers. The non-utility submissions — including those not covered here, mostly written by consultants and analysts — all involve a significant amount of both theoretical and work in designing new electricity systems. Not so for the utility proposals, which spent most of their time affirming the positive aspects of today's system and arguing for changes at the edges of the grid. Of course, no one expects an incumbent to design a market that would put them out of business.

Regardless, the difference in expectations and objectives between the utility contributions and those of the grid reformers is intense. While one group sees a broken industry full of unaccounted for externalities, unfair market practices and unwarranted ratepayer risks, the other sees an electric system that is remarkably successful at its core duties — providing cheap and reliable power.

The gap between grid reformers and utilities isn't new and will not be bridged by SEPA's 51st State initiative alone. But what the project does is open up a safe space for discourse on energy system reformation, where the usual stakes of regulatory action and impacts on ratepayers and the environment are not real.

Talking about electricity reform may not open up a new regulatory docket or get a bill introduced in a state senate, but if [recent system reform efforts](http://www.utilitydive.com/news/beyond-the-substation-how-5-proactive-states-are-transforming-the-grid-edg/369810/) (<http://www.utilitydive.com/news/beyond-the-substation-how-5-proactive-states-are-transforming-the-grid-edg/369810/>) teach us anything, it's that discourses matter — that the daring ideas floated today can become the core of a transformative initiative tomorrow. We're already seeing that happen in [places like New York](http://www.utilitydive.com/news/in-new-york-utility-of-the-future-will-be-air-traffic-controller/373342/) (<http://www.utilitydive.com/news/in-new-york-utility-of-the-future-will-be-air-traffic-controller/373342/>), where regulators, reformers and utilities are hard at work hashing out the details for a new distributed energy market.

There's certainly no shortage of those daring ideas in the 51st State, from both utilities and industry watchers. As SEPA President Julia Hamm said when the initiative launched, its goal is to create "a test-bed that offers a new way to think about solar . . . and a resilient, reliable grid.”

But with a clear desire in many communities to reform the energy system, don't be surprised if the “test-bed” of ideas begins to look more real. If stakeholders begin taking these ideas back to their states, one may just show up on a regulatory docket near you.

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