Addendum to The 51st State: Market Structures for a Smarter, More Efficient Grid

We'd like to use this addendum to share our thoughts on the discussions at the 51st State Summit and address the questions that were raised about the ideal state of Welhuton.

We, the authors of the Welhuton proposal, note that we shared very similar views with those who also submitted proposals to SEPA's 51st State Initiative. These views include the common understanding that regulated utilities will play a key, strategic role in the delivery of energy services in any ideal state. New grid technologies such as DERs offer today's power industry the opportunity to both empower its end consumers and further improve the efficiency, resiliency, and flexibility of the grid. However, to take advantage of these opportunities, we recognize that existing regulatory models and pricing mechanisms need to be updated to reflect this new environment.

We noticed that the most vexing questions we and other authors received at the conference centered around who gets to do what and for how much in these new models. These questions included the following from the black and white hat tables:

- What are the roles of the utilities, third parties, and customers, in detail?
- Is smaller necessarily better (distributed technologies vs. large-scale technologies)?
- Can we trust competitive players to ensure universal access and protect the underprivileged?

The best way to answer the "who" and "what" in Welhuton is to first ask the "how".

In the ideal state of Welhuton:

- How do we allocate resources to where they are most valued?
- Or conversely, how do we assign risks and costs to those who are most willing and able to assume them?

Basic economics teaches that freedom of choice and market forces are the best means to answer these questions; and in Welhuton, we maintain that this is true in the electricity industry *especially* because of the growing presence of distributed technologies.

To be clear, we do not presume that DERs are necessarily better than centralized generation. Quite the contrary, the state of Welhuton seeks to move away from these kinds of value judgments, which presupposes the superiority of one technology or business model over another. Prevailing regulatory models rely heavily on such value judgments. For that reason, we argue that we will likely see even more contentious debate regarding regulatory issues from net metering and demand response to rate design and investment decisions. We contend that an open and neutral platform that allows all players and products to fairly compete will best enable customers and the power industry to determine *what* resources get deployed (small/distributed vs. large/centralized) and *who* gets to own them. This is not a call for unfettered, unregulated competition. It is call for more competition under a regulatory framework with a neutral grid operator.

With this understanding, we would like to address some questions about the Welhuton model.

Is the creation of an independent distribution system operator (IDSO) a prerequisite to more investment in distributed energy resources?

A neutral grid operator *is* the prerequisite. The grid operator should not have a conflict of interest in choosing between assets owned by utilities and those owned by customers and third parties. There can be means other than the IDSO to mitigate this conflict of interest. For instance, utilities may be disallowed to

earn a rate of return on assets they own—much like the regulation that applies to municipal utilities and electric cooperatives. Utilities can own and operate the grid as a distribution system platform (DSP) and be governed by strict standards of conduct. New York's REV proceeding takes this approach. Finally, there can be a competition for the role of the distribution system operator (DSO), in which qualified utilities or companies must compete for the DSO position every, say, 10 to 20 years, and can lose the position if they underperform. This model is similar to the one present in Germany and is advocated by Senator Angus King of Maine. Of the various approaches, we argue that the best way to achieve neutrality in the IDSO framework is to disallow operators of the grid from owning assets on the grid. If a DSO is to be the "air traffic control" of the grid, can we trust that these air traffic controllers will serve the public's best interest if they also own airlines?

Besides eliminating the conflict of interest, what are the other benefits of an IDSO?

The IDSO can integrate with the ISO and allow aggregated DERs to bid into the transmission grid. This will increase efficiency and lower costs to consumers. The IDSO will reduce the risks that have to be borne by utilities; investment decisions would be transparent and made by the IDSO. Utilities will have more certainty on approvals and cost recovery for investments.

Will a push for more free markets leave less privileged customers with higher cost electricity, less reliability or even denial of access? Who is backstopping the free market as the provider of last resort?

No. We should be suspicious of arguments that falsely pit free markets against protecting the public's interest. In fact, more competition can better ensure that the underprivileged get more cost-effective or superior service. The provider of last resort (POLR) can be a dedicated competitive retail provider who bids for the service, or it can be rotated among competitive retail providers. Welhuton would subsidize these energy providers – using fees levied on all other customers – so that these providers can serve the less privileged. These providers will compete against each other for the right to be the POLR and would be evaluated against transparent performance metrics set by the state and its commission. This approach is similar to how the Netherlands and Switzerland currently provide universal healthcare completely through private insurers.

Can you explain how the Energy Box would work in greater detail (Who owns it? What is its jurisdiction? How does it interact at the DSO/ISO level? How dynamic do we make rates for a particular level of adoption?)

The energy box is a buffer between complex, dynamic rates and a consumer who expects a simple, consumer-friendly interface. Energy boxes leverage automation technology and machine-to-machine communication to translate real-time grid requirements into an invisible, seamless consumer experience. There was debate at the conference about whether the energy box needed to be a physical technological entity; we believe that remains to be seen as the penetration of automation technology increases. At its core, the energy box is a consumer-level buffer, fulfilling the same needs on the grid as a mutual fund does for consumers on the stock market.

In a scenario with an energy box, the question of how dynamic rates can be depends more on the sophistication and reach of the energy box provider than it does on any other factors. It is the energy box that is translating the complex rate into a consumer-friendly experience; therefore, the rate can be made as complex as the energy box provider can handle without affecting the consumer experience.

How and who operates the energy box will likely differ depending on how the energy industry develops moving forward. Ideally, there will be numerous energy box providers in Welhuton offering competitive value propositions and consumer experiences so users—whether a single household, a community, or

other jurisdiction— can choose the energy box that best fits their needs. How energy boxes interface with other aspects of the energy ecosystem (i.e. ISO, etc.) needs to be determined; we welcome an in-depth discussion about energy box technology in the context of various regulatory environments in Phase II.

Is the Transactive Energy (TE) tariff the only pricing mechanisms that would work?

No. We offer the TE model as an *ideal* end state, but we see it as one of a variety of options for a more market-based approach. We recognized that there are a number of hurdles (including consumer acceptance of TE, jurisdictional challenges, and the need for widespread deployment of interoperable DER technologies) that may make TE unsuitable in many markets or service areas. Nevertheless, TE provides a useful framework and promising concepts that should be considered as we reform utility models including: forward contracts for the purchase of energy services, a market for energy and the transport of energy, and pricing based on location and timing.

How difficult would it be to start implementing these ideal solutions? How much of these ideal solutions do we need to implement in order to get a majority of the benefits?

It is not resource-intensive to implement the foundational components of the Welhuton proposal, the IDSO framework and energy boxes, in today's environment. The IDSO would not be built from scratch, but rather pull from the expertise and resources currently housed in various organization such as utilities, ISOs, regulatory bodies, etc. Though the exact mechanism will vary, we propose splitting off groups with the relevant expertise and merging them into the independent entity that will become the IDSO. Regarding the energy box, the technology to enable energy box functionality is well established; what those with this expertise need now are the proper incentives to be able to reap value from developing such energy box solutions.

Although there are few large-scale quantitative analyses available on the impact offered by components of this ideal solution, this is currently an active area of research in many academic institutions. Please reach out to the authors for more information or to be put in touch with the relevant researchers at MIT, BU, and other institutions.