DecisionWare Group
Policy Analysis for
Energy, Economy and Environment

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Subject: Energy Strategy Modelling Recommendations

We are almost to the middle of the most decisive decade yet in our fight to transition to a clean energy system that does not contribute to the climate crisis. Our current planning and regulatory processes are siloed according to the individual regulated utility companies, and the state does not yet have a planning process that can identify the benefits of optimizing across our entire interconnected energy system. Therefore, this ODOE study will be unique in its ability to look at every sector of our interconnected energy system so that the modelling and analysis can examine:

- trade-offs between sectors and fuels, such as vehicle electrification and heat pump adoption;
- trends in technology cost, performance and availability, and
- the impact of new and emerging technologies.

I started working full-time in the renewable energy field in 1980 as part of the Solar Energy Program at Sandia National Labs, and a few years later I left to manage the renewable energy program as Bechtel Corporation, where I helped lead development of PVUSA and the Solar Two Power Tower. Back then, the renewable energy community started discussing the paradigm shift from the centralized utility system to a distributed and smart network composed centralized and distributed generation and storage, demand response enabled by virtual power plants and smart devices. Back then, renewables were still quite expensive for grid applications, but had niche markets that helped them develop to the point where solar and wind are currently the lowest cost new generating resources available. Many other components of this transition are already cost effective, such as grid enhancing technologies and reconductoring, which are already in commercial use in Europe. Other such as batteries are becoming more cost effective – leading to expanded applications, while long-term storage and other new technologies are still on the horizon.

Since 2000, I have performed full-sector deep decarbonization studies using the MARKAL/TIMES framework in China, the U.S., and over a dozen other countries. Unfortunately, many current planning frameworks suffer from built-in biases in favor of the traditional centralized utility system, which is why we need modelling and analysis tools that that will accurately analyze their potential role of a distributed smart grid in our energy future.

I commend ODOE in seeking input on the design of the study, and recommend that whatever consultant and modelling framework is elected, that they have the capabilities to:

- Include all supply resources and demand sectors in our interconnected energy system so that the impact of cross-sectoral changes, such as vehicle electrification and heat pump adoption, can be analyzed,
- Model several levels of scale:
    1. First at the level of the regional northwest energy system to establish boundary conditions for the second level,

2. A long-term Oregon planning model using annual flows, with time-sliced reserve capacity calculations, and third,
3. A power flow model that can take the system configuration data from the annual model and run it against multiple weather variations of the normalized weather used in the annual model to assess resilience and reliability.

- Model all transmission expansion options, including grid-enhancing technologies and reconductoring existing transmission towers.
- Represent major congestion points in the transmission and distribution system so that option for relieving congestion can be examined.
- Represent the full range of Energy Efficiency (EE) options for all demand sectors, as developed collaboratively with Staff, Stakeholders, and Energy Trust of Oregon.
- Represent a broad range of Small-Scale Renewable (SSR) and Community Benefit Renewable Energy (CBRE) project types, and identify model parameters that can be used as metrics to quantify the net benefits and potential of each class of SSR/CBRE projects, as developed collaboratively with Staff, Stakeholders, and Energy Trust of Oregon.
- Represent net-metered rooftop solar installations 1) with an integrated storage requirement and 2) without the storage requirement but with strategically located sub-station storage.
- Represent Aggregated Demand Response and Virtual Power Plant technologies, with options for utility (or public) financing of residential and/or commercial battery systems.
- Include potential a Long Lead Technologies, such as offshore wind, geothermal, and advanced storage technologies for medium and long-term requirements.
- Use Portfolio Analysis to define a limited set of possible future pathways, and use Sensitivity Analyses to examine the impact of new and emerging technologies based on variations in projected technology cost, performance and availability.

Thank you for providing this opportunity to comment, and I look forward to participating in the public workshops to come.

Sincerely,

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