Democratizing Utility Data to Accelerate the Clean Energy Transition

Jason Price, Liam Benson, and Anthony Jung

In the months and years to come, the utility industry should anticipate an increasing number of regulatory commissions to begin ruling on third-party access to utility data. Several state orders are currently examining the implications of making utility data more accessible to third parties and customers. Some states are going further and broadening the data pool to include more than just customer-metered end-use data. Whichever position a state may take in democratizing its data, it should do so in a way which will encourage customer adoption and improve the marketing and sales of distributed energy resources (DER) and other energy solutions to help states reach their net-zero carbon goals.

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National and state initiatives to democratize data have had mixed reviews, from complete abandonment to growing adoption. The movement to democratize data began with the proliferation of smart meters under the American Recovery and Reinvestment Act (ARRA) during the Obama Administration in 2009. Included in the Act was a mandate that utilities across the United States collect and make customer meter data available to third parties and other stakeholders. Modeled after the Blue Button Initiative, a national movement that enables consumers to have access to their own health information, the Obama Administration's Green Button Initiative (GBI) was designed to empower customers to make more informed energy decisions on their own energy usage. Proponents of the GBI believed that greater access to customer data would motivate better energy decisions and spur market innovation in energy efficiency, demand response, and other technologies and practices available at the time. For numerous reasons explained later in this article, the GBI fell short of achieving national adoption. Today, regulators are viewing utility data through a modern lens and closely examining states, like Texas and California, on how they have addressed utility data democratization.

TYPES OF UTILITY DATA

Utility data varies and comes from several business areas within a utility, all of it playing a critical role in maintaining the performance of a modernized grid. For example, customer data is typically in the form of energy use and billing information. Grid asset data, available to system operators, monitors the health and performance of the grid, including distribution automation equipment, substations, and other sensors and controls. Advanced meter infrastructure (AMI) data is available in 15-minute intervals and represents the foundation of the GBI. AMI or metered data profiles customer energy use. DER and hosting capacity data captures key DER grid edge technologies that can be supported by a specific circuit on the grid. DER data is essential for developers of solar, electric vehicle (EV) charging networks, geothermal systems, microgrids, heat pumps, and other clean energy technologies.

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Customer meter data, coupled with circuit data and other utility asset data, will allow the marketplace to deliver cleaner energy solutions to homes and businesses. How regulators rule on the accessibility and availability of utility data may determine whether a state, and its associated utilities, can even remotely achieve state decarbonization goals. Initiated several years ago, Texas and California are two examples of where previously mentioned forms of utility data were organized and made available to third parties, with the intent to increase market awareness about the value of this data to help empower customer choice and accelerate clean energy initiatives. Both programs are in use today and are often referenced as successful examples for the rest of the nation to model.

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Texas

Texas built a central meter data repository where all Texas utilities that are part of the Electric Reliability Council of Texas (ERCOT) are required to post their smart meter data. Smart Meter Texas (SMT) makes it easy for customers and competitive service providers to gain access to near real-time customer meter data rather than having to petition both the utility and the customer for the same data that exists in the portal. The energy supply in Texas is deregulated so there are over 70 competitive energy retail companies (i.e., companies with the sole focus of retail sale of electricity or natural gas, or both, to specified customers), who can provide energy quotes and related energy efficiency services based on readily available data through the portal.[1] The Texas model introduces creative market solutions that best fit the needs of customers' businesses or lifestyles. It is also important to note that utilities themselves are simply distribution companies and do not serve customer commodity loads.

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SMT stores daily, monthly, and even in 15-minute intervals for up to 2 years. The

[1] Callmepower.com. *Electricity Companies in Texas: Choose a Retail Electric Provider.* Retrieved from https://bit.ly/3zM0Poj.

statewide platform provides secure access to the data. Customers can invite authorized competitive service providers to access the energy data for competitive quotes on a range of energy-saving services and rates. These energy service companies (ESCOs) differentiate in a variety of competitive ways to offer customer choice and options that best fit the customer.

California

California organized their utilities to collectively standardize the data and make it available at the utility level rather than through a statewide portal like in Texas. Each utility makes smart meter data available and follows the same procedures statewide for data access, data definition, and data portability. Where California differs from Texas is in the addition of DER data for market developers. DER data includes grid-hosting capacity, enabling increased marketing of clean energy development with an advanced emphasis on data democratization by expanding the definition to include data to support energy supply rather than just energy demand, as in Texas.

Where California differs from Texas is in the addition of DER data for market developers.

Development of DER in some locations is dependent upon whether the specific circuit in that location has the capacity to host excess load from the DER. Hosting capacity data, defined as the amount of DERs a distribution system can accommodate without significant grid upgrades, is critical for businesses seeking to make electrification investments. For example, if a circuit is unable to sustain a fleet of EV chargers without costing the developer hundreds of thousands of dollars in grid upgrades, then the entire investment is for naught. All California Investor-Owned Utilities (IOUs) provide a publicly available web portal for anyone to view the hosting capacity at the substation level on their grid. This was mandated by the California Public Utilities Commission (CPUC) several years ago and the utilities have complied.[2] Availability of this information has helped renewable energy developers better target and plan for renewable projects.

As an example, Southern California Edison (SCE) offers a publicly available integration capacity analysis (ICA) portal which allows users to model if additional DERs can be added without the need for any grid upgrades. SCE performs an analysis on every section of every feeder in their territory using 576 profiles for circuit-level load and generation.[3] More granular data, down to the meter or individual generator, is more difficult to process due to the maturity of the network models and availability of generator data where third parties own the DER data. These ICA results are shown on a public website that displays how much generation and load differs on parts of the circuit and potentially support, along with how much existing and queued generation there is on a circuit and substation level. The data makes DER planning and development far more practical and market-oriented. The comprehensiveness and completeness of both metered data and DER data has made California a market leader.

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New York

New York is trailing Texas and California. New York's Climate Leadership Community Protection Act (CLCPA) of 2019 is designed to jump-start clean energy initiatives and the role that utility data serves.[4] With access to integrated metered

[2] Wilson, N. (2021, February 2). *CPUC Ruling Improves a Key Grid Transparency Tool for Siting Renewables, Energy Storage.* IREC. Retrieved from https://bit.ly/3zQSAYe.

[3] Stanfield, S. (2018, October 16). *Key Lessons from the California Integration Capacity Analysis.* IREC. Retrieved from https://bit.ly/3SjqLi7.

[4] Morris, J. & Farmer, M. (2019, June 20). *Unpacking New York's Big New Climate Bill: A Primer.* NRDC. https://on.nrdc.org/2YvHNNX.

customer data and energy system DER data in one portal, the regulators anticipate greater rigors to the data and anticipated efficiencies to accelerate the deployment of clean energy solutions across the Empire State.

As stated in the Proceeding on Motion of the Commission Regarding Strategic Use of Energy Related Data (NYS PSC, CASE 20-M-0082): Such action, "will attract investment, enable analytics, help identify operational efficiencies, promote innovation, and encourage new business models, which will in-turn create value for customers and the State's energy system."[5] New York is one of a handful of states addressing this topic, but the first to push forward a comprehensive integrated data approach through the New York State Energy Research Development Authority (NYSERDA) program called Integrated Energy Data Resource (IEDR).

The Rest of the Country

Now with state climate goals, pressure from industry and public advocacy groups for data access, and success of sister industries on how they manage their data, namely in health and financial services, regulators and policymakers are placing more value on utility data. However, each state is approaching the democratization of the data differently. Each regulatory authority has its own agenda and financial constraints on what can be recoverable or part of utility operations and maintenance.

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Several state regulatory commissions are currently seeking public input on how best to improve on what other states have accomplished and learn from sister industries on how best to manage and protect data. For example, regulators are studying mechanisms that may allow customers agency over their data, including opt out, ease of access and use, standardized methodologies, data portability, security measures, incorporating rate tariffs, and other steps to boost customer adoption and third-party engagement, while some states are exploring the idea of charging for usage of the portal. This includes monitoring and verification of controls as it relates to accessing data for marketing purposes. Exposing utility DER and circuit data to third-party developers as key data points for DER deployment can introduce grid vulnerabilities. There are several state regulatory dockets across the country looking at data accessibility:

- New Hampshire Open Energy Data Platform (Docket No. DE 19-197)
- North Carolina data access rulemaking (Docket E-100, Sub 161)
- New Jersey AMI Data Transparency (Docket EO20110716)
- Illinois Open Data Access Framework (Docket No. 14-0507)
- Maryland RM62 (Public Conference 44)
- Michigan MI Power Grid Data Access and Privacy (Case U-18120)
- Other states in discussions—Arizona, Colorado, Massachusetts, Minnesota, Pennsylvania, Washington D.C.

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While Texas and California have many notable achievements given the sizable effort and hefty investment that was required, adding DER and hosting capacity data promises to improve customer adoption of DER. This addition will provide customers and third-party developers with the information needed to make the right energy investment decisions for the future. To avoid buyer's remorse, state initiatives should include metered and DER data

[5] New York Department of Public Service. (2020, May 29). Case 20-M-0082: Proceeding on Motion of the Commission Regarding Strategic Use of Energy Related Data. Retrieved from https://binged.it/3JqhbX2.

and take a comprehensive approach to achieve decarbonization goals. This will only be possible with the integration of meter data with DER data. The upfront investment is future-proofing what data third parties and the public need to accelerate clean energy development. The examples shown in **Figure 1** illustrate the value of an integrated data approach.

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CONSIDERATIONS FOR THE UTILITY

Once regulators define the framework and overall requirements of a statewide data platform, the utilities will need to participate. Two parallel workstreams are required: one for the state to assemble a team to organize and build the platform to ingest the data that will come from each utility; another for the utility to shore up its data for the release of the data to the state open-access portal.

If a regulatory order is passed, a utility should create a Utility Data Transformation Office to lead the coordination and meet the requirements for eventual release to the state portal. This Office should represent and consider the following:

- **Create a Utility Data Project Management Office (PMO).** The PMO should demonstrate competencies in the build-out of data platforms and associated data management capabilities for sustained value creation. Critical skills should include data governance program definition (i.e., organization, policy, procedure), data platform design and build, delivery of integrated energy data resource plans, and architecture with advanced use case delivery across customer experience and grid modernization.
- **Build a Multi-Disciplinary Team.** Engage the team with members who have deep industry experience across electric and gas utilities coupled

Figure 1. Example Use Cases of an Integrated Energy Data Resource

Use Case	Intended Purpose
Energy Efficiency Customer Identification	As a DER provider, government agency, or community organization, it wants to identify, evaluate, and engage potential energy efficiency customers so that it can increase the adoption rate of energy efficiency programs in its state.
DER Customer Identification	As a DER provider (e.g., rooftop solar, energy storage, etc.), it wants to accelerate the identification, evaluation, and engagement with potential DER customers so that it can identify the most relevant customers and initiate a consent request to them to share their identifying information and usage data.
DER Interconnections	As a DER developer, DER owner, or utility, it wants to accelerate the interconnection approval for planned/installed systems so that the DER project can begin delivering clean energy to customers as soon as possible.
DER Registry and Aggregation	As a DER aggregator or utility, it wants to access information about all DER installed in the geography so that installed DER systems can be aggregated to provide energy and resiliency to the grid in a cost-effective and efficient manner by participating in the wholesale markets.

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with deep data engineering and analytics skills. This team will draw from experience delivering data analytics engagements that have helped utilities and other regulated entities convert data into actionable intelligence and value.

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- **Deep Utility Data Knowledge.** A successful team demonstrates a working knowledge of utility systems and analytics use cases relevant for customers and grid operations. This will prove worthwhile in the long run as the utility scales with more data.
- **Systems-Thinking Approach.** The team should try to envision how the utility's systems will integrate with the state's intended data platform, considering all stakeholder perspectives when building the solution. Skillsets for this approach include data engineering, analytics, and visualization expertise.
- **Data Governance.** Delivering a data governance plan is top priority and often utilities find addressing the governance question critical for success. Key questions that must be answered include: Who owns the data? What defines the data or "data definition"? What are the data rules for participation and engagement? What of the data will be portable? What can we learn from other industries? What are the processes and procedures for protecting data and mitigating risk? What are the rules and frameworks for verifying and securing usage and preventing profiteering?
- **Data Maturity.** The Utility Data Transformation Office must understand where the utility is in its data maturity journey. If the utility is not on pace with its in-state peers from a data maturity perspective, the team must have the insight to identify where investment upgrades are needed on the system to meet the Public Utilities Commission (PUC)'s requirements.
- **Technology.** Interval data from smart meters introduces data at a scale measured in terabytes that can overwhelm a utility as it tries to get its arms around this ever-increasing pool of data. The field has introduced a new class of technologies and requires advanced skillsets needed to manage this data and deliver what is needed by the PUC.
- **Trust.** Complex questions must be answered by a multi-disciplinary team that includes cyber security, data governance, and members of the Utility Data Transformation Office. Key questions that must be answered include: Should the data become public, who is responsible for customer privacy and security? How can a customer opt out of market participation? How is the marketplace evaluated, what businesses have the right to this data, and how can the intentions be verified to protect all stakeholders? What may work in Texas or California may not necessarily be congruent with the rest of the country.

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CONCLUSION

Grappling with key questions around democratizing the data, each state will eventually have to define what data will become available and what role the utility will serve to influence customer behavior and engage third-party developers. If the state's decision is to democratize data through a standardized approach, then the portal must also include all the utility data necessary to support the state's clean energy goals. Given a climate imperative, states must act now to arm the marketplace with the data necessary to change customer behavior and accelerate the build-out of clean energy solutions. Anything less will be incomplete and hold back the state from taking advantage of the climate-positive benefits that a comprehensive portal can offer.