

[Recurve](#) is an industry leader in meter-based demand flexibility. Recurve's analytic platform identifies where distributed energy resources can bring the greatest value and tracks changes in energy consumption resulting from demand flexibility interventions for both individual buildings and in the aggregate to support resource planning and facilitate performance-based transactions. We encourage and support market-based solutions for decarbonization.

We appreciate the opportunity to share our thoughts and preliminary answers to the questions posed in "*The Future of Distributed Flexibility*." Our answers derive from our recent experiences establishing market frameworks to deliver distributed flexibility utilizing a common digital energy infrastructure. While the terminology may differ slightly, the core concepts of transparency, accountability, and streamlined delivery of demand flexibility are the same. We look forward to supporting follow-up conversations with more detail to enable the data-driven demand flexibility markets in the United Kingdom.

Section 1

1. What do you think distributed flexibility could contribute to the energy system?

Primarily distributed flexibility offers more options for low-cost energy resources like energy efficiency, demand response, and customer-site generation into the mix to optimize our energy resources on the path to decarbonization. Flexibility can make a substantial contribution to reducing energy and capacity procurement costs and should be considered a priority infrastructure and operational investment.¹

2. Will a focus on CER (Consumer Energy Resources) flexibility also help enable other forms of flexibility, especially distributed flexibility?

A focus on investing in Consumer Energy Resources will help augment the value of distributed flexibility by engaging customers (and compensating them appropriately) for their contributions to grid reliability and resilience. Where they are able, consumers can also make private investments in their own resilience that can complement efforts to reach net zero and supplement grid operations.

Section 2

3. Is there a 'case for change' and a need for a common vision for distributed flexibility?

Yes. The core "case for change" is that energy system planning must consider all energy resources that can complement system optimization, especially when prioritized for decarbonization policies. Distributed flexibility is key to unlocking a decarbonized, reliable grid of the future. The common vision can be as simple as all resources having a chance to "play" and be compensated for the value they deliver.

¹ A recent report from [the Brattle Group](#) estimates that investments in "virtual power plants" a form of demand flexibility could save US utilities billions in capacity costs in the next ten years.

4. What is your vision for how to accelerate the delivery of accessible, coordinated and trusted markets for distributed flexibility?

Recurve's vision for accelerating the delivery of accessible, coordinated, and trusted markets for distributed flexibility is to make it "work like everything else." Demand flexibility can be procured and financed via contracts equivalent to a power purchase agreement. The changes in energy consumption they deliver can be quantified with common open-source weights and measures framework to provide trust and transparency in market transactions and system planning. Open markets enable innovative vendors to deliver technology-agnostic solutions to consumers. Utilities and regulators can see the outcomes derived from any number of interventions using the same lens for performance accountability.

This vision is gaining momentum through implementation. In response to an [Emergency Proclamation](#), California took action to address a statewide electricity shortage. The California Public Utilities Commission authorized the [Market Access Program](#) as a strategy to reduce peak demand. This program was created by [D.21-12-011](#), which authorized up to \$150 million to fund projects that are incremental to the main energy efficiency portfolio. Market Access incentivizes peak savings (7 to 9 pm) during the summers of 2022 and 2023, with payments based on actual savings at the meter with value tied to avoided cost and emission reductions to address summer reliability. The program is open to qualified aggregators.

The open market leverages the publicly available avoided cost curve² as the price signal to aggregators. In six months, the open market nearly doubled the system benefits generated by the traditional energy efficiency portfolio and delivered double the system benefit per unit of energy saved. The [Demand FLEXmarket](#) is currently operating in several jurisdictions.

5. Will certainty of an end vision help accelerate enabling work and make it cohesive?

Certainty of the end vision or the outcomes - clearly communicated as a price signal to the market - will help accelerate investment and drive innovation from the many sources we cannot even predict. The value of cohesion comes from the consistency of valuation and defining performance with a common standard.³

² Documentation of the components of California's Avoided Cost Calculator is available here: <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/demand-side-management/acc-models-latest-version/2022-acc-documentation-v1a.pdf>

³ The [OpenEEMeter](#) provides a common weights and measure for demand flexibility by operationalizing a method and provides a Python code base that is available under an open license available to any market actor without restriction.

6. When should a common digital energy infrastructure be in place? And therefore, when should development begin?

The time is now to establish a digital energy infrastructure, which can be executed rapidly depending on the details and complexity expected and the available data assets. We agree that a platform to enable a common digital energy infrastructure could streamline and accelerate this vision by addressing core market failures outlined in the report:

"The common digital energy infrastructure would address three of the market failures by delivering information provision, market coordination of operations and actions, and trust and governance." ~ p. 8

The FLEXmarket platform, and Recurve's other analytical tools, are designed to build the information bridge between regulators, utilities, aggregators, and customers to coordinate the delivery of operations and outcomes. With a common price signal and a standard method to quantify performance impacts, it also supports trust and governance of the program model for accountability.

Section 3

7. What should a common energy digital infrastructure look like, and why? Please consider the archetypes or develop your own proposition.

We recommend Ofgem consider the FLEXmarket as a prime example of a common energy digital infrastructure because of its simplicity. It combines the core components of access to information and market coordination via price. It enables trust and accountability within the market with a transparent means of performance settlement via open-source weights and measures.

The platform solution begins with a common price signal that captures the time value of changes in energy consumption. The avoided cost provides a base value; other value, like decarbonization, reliability, and equity, can be layered on top of the base value of avoiding energy use at specific times.

This value stream is provided directly to the market as a price signal for the short and long-term value of interventions that will result in changes in energy consumption patterns needed to optimize the grid and/or achieve decarbonization objectives.

Market actors (aggregators) design business models to connect with customers and are paid by customers for the value of the project to them (i.e., comfort, bill reduction, etc.). The market sponsor pays for the value delivered to the grid (i.e., avoided cost, reliability, etc.). Customers often receive a direct payment, and aggregators can finance many interventions creating a cash flow by selling the demand flexibility delivered.

Variations on this model can be adapted to the local needs for appropriate value streams, payment cadence, and other factors. At the end of the day, however, the impacts delivered are the basis of payment in the market, and data infrastructure provides the upfront intelligence to forecast performance and ultimately pay on the performance.

8. What is your view on the desirability and feasibility of the archetypes or your own alternative proposition?

The FLEXmarket model offers a streamlined approach to delivering demand flexibility when and where it is needed most. Market actors have found it a desirable pathway to build compensation for grid value into their business operations rather than adapting to a complex and rigid program model for delivering technology-specific rebates. Given that customer technology solutions, open source methods, and code base are available today; it is feasible to operationalize an open market model like FLEXmarket almost anywhere. Similarly, customers have been highly satisfied with how service providers have delivered on their goals for reducing energy use, increasing comfort and safety or improving economic competitiveness.

The California Public Utilities Commission cited several benefits when adopting this model to address summer reliability issues in 2021. The rationale of their final decision is available in [D.21-12-011](#), and program plans and reported progress are available on their [web page](#). In summary, they cited the following primary benefits of this model being accountability and the ability to draw in a wide array of providers.

"The major benefits of the program are that funds are only expended for portfolios of projects that deliver verifiable energy savings at peak times. In addition, any implementers that can deliver those savings and meet standardized eligibility criteria will be able to participate in this type of standardized program." p. 24.

Section 4

9. Should a common digital energy infrastructure be new-build, or should it build out from existing infrastructure?

Based on our current market knowledge, market vendors operating in this space can build a common digital energy infrastructure. It would **not** have to be built from scratch, and even if it originated or was customized for a specific organization's implementation, a competitive solicitation could successfully attract and procure solutions that are capable of launching a common digital energy infrastructure that could deliver on the core components envisioned in the report. Though it may take time and iteration to fully realize some capabilities.

10. What are the important areas for consideration when designing institutional delivery models for a common digital energy infrastructure?

The key considerations in institutional delivery models must consider the "why" and the elements of the market they can enable or operationalize (e.g., data availability). We have operated FLEXmarkets with county governments, focused on economic development and decarbonization, as well as utilities and load-serving entities focused on grid value and cost optimization. Either model can be functional if the market sponsor or institution has a core value stream that can translate to a price signal and have the data access authority to operationalize the market.

11. What are the important areas for consideration when designing financial delivery models for a common digital energy infrastructure?

Financial delivery models can vary for any situation. Existing financial mechanisms like power purchase agreements could be more effectively leveraged for demand flexibility as a model for project financing. This model could be complemented by public funds to support investment in the social benefits of air quality or decarbonization.

Resources:

[Decarbonization of electricity requires market-based demand flexibility](#)

The Electricity Journal, Volume 32, Issue 7, August–September 2019, 106621

[Demand FLEXmarket](#); Access to information about market structure, current markets, aggregators and other applications.

[Market Access Program](#): California Public Utilities Commission

[California has a plan to pay efficiency providers to help prevent blackouts](#) Canary Media 19 November 2021

[MCE Launches \\$6 Million Residential Efficiency Market Program](#), April 18, 2022

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