California Public Utilities Commission

Guiding Principles for Demand Response in California

ENERGY DIVISION STAFF PROPOSAL

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Executive Summary

To support the development of a comprehensive, reliable, and cost-effective future for demand response in California, Energy Division staff recommends a set of updated guiding principles for demand response in California. The proposed guiding principles are grounded in the existing principles and objectives for demand response developed collaboratively by the California Public Utilities Commission (Commission), the California Energy Commission (CEC), and the California Independent System operator (CAISO) in prior interagency collaborations.

The Commission, CEC, and CAISO have a long history of interagency cooperation on demand response and other distributed energy resource policy initiatives, including the State's Energy Action Plan for California as well as the first interagency vision for the future of demand response in California.[1, 2]

This Energy Division proposal reaffirms the foundational objectives of demand response—improving grid reliability, reducing costs to ratepayers, and supporting the state's environmental mandates—while introducing an updated set of guiding principles to ensure demand response is a consistent, predictable, reliable and cost-effective resource . The proposed updated guiding principles are:

1. Demand response shall be **predictable and reliable** in order to be incorporated into the State's forecasting and planning frameworks and depended on in both system planning and real-time grid operations.
2. **Standard and consistent** valuation methodologies and evaluation metrics, along with standardized data formats, communication protocols, and data access processes, shall be adopted to enhance the transparency, comparability, and effectiveness of demand response resources and programs across the State.
3. Demand response resources in California shall be **cost-effective** and demonstrate clear value by delivering measurable system and ratepayer benefits.

[1] State of California Energy Action Plan, adopted: April 18, 2003 by the CPA; April 30, 2003 by the CEC; and May 8, 2003 by the CPUC.
[2] D.03-06-032, at 7-8 and Appendix A.

4. Demand response resources and programs shall continue to support California's **energy and environmental goals** and prohibit use of fossil fuel generation except under strictly limited conditions.

1. Background

2003: Draft Interagency Vision

In 2002, in response to the 2000-2001 California energy crisis, the Commission instituted Rulemaking (R.) 02-06-001.[3] This foundational rulemaking developed a set of comprehensive demand response policies and practices in an effort to improve the reliability of the State's electric system, reduce costs to ratepayers, and protect the environment.[4]

During this proceeding, three working groups were established. The first working group (WG1) was an interagency working group comprised of principles and staff from the Commission, the CEC, and the California Power Authority (CPA).[5] WG1 supported record development in the rulemaking and guided policy. WG2 focused on large commercial and industrial customers, while WG3 focused on smaller commercial and residential customers participating in demand response.[6]

A draft interagency vision statement for the future of demand response in California was developed by the agencies and received feedback from stakeholders. The draft interagency vision statement was attached to D.03-06-032 but not formally adopted by the Commission because it was deemed as "a work-in-progress at all times."[7] Of relevance to this staff proposal, the draft interagency vision statement included the below objectives and principles:

Objectives

- Cost-effective demand response should be used to meet a portion of the reserve requirements.

[3] R.02-06-001, Order Instituting Rulemaking on policies and practices for advanced metering, demand response, and dynamic pricing.
[4] D.03-06-032, at 3.
[5] The California Consumer Power and Conservation Financing Authority (California Power Authority, or CPA) was established by the Legislature in 2001. Its function, as described in P.U. Code § 3310 and throughout Division 1.5 of the Code, was to incent new generation and to develop new demand-side management programs.
[6] D.03-03-036, at 3-4.
[7] D.03-06-032, at 7-8 and Appendix A.

- Demand response resources should lower power costs using several approaches, including the use of dynamic retail rates.
- Demand response should contribute to environmental protection goals by reducing the need for – and never encouraging increased use of – fossil fuel generation resources.

Principles

- Demand response programs should be periodically evaluated to determine past performance and improve future effectiveness.
- Effective demand response efforts require coordination amongst several agencies.

2007: Energy Division's Proposed Demand Response Goals

In Phase 2 of R.07-01-041[8], Energy Division issued a staff proposal summarizing the goals described in the 2003 draft interagency vision statement, and providing updates on the state's progress towards achieving those goals.[9] These updates recognized the tremendous changes that had occurred in the years since the initial vision statement, including progress towards the rollout of advanced metering infrastructure in California, and CAISO's ongoing efforts to integrate demand response resources into its wholesale markets.

Energy Division staff then proposed several goals for demand response in California, building upon the 2003 draft interagency vision statement. In part, the 2007 staff proposal included the following goals:

- Demand response resources should react to economic signals sent by the wholesale market, thereby reducing the need for CAISO to trigger scarcity pricing. Misalignment between demand response resource triggers and wholesale market prices is detrimental to California's ratepayers.
- Encourage the use of technology to automate demand response. The predictable and repeatable nature of technology-backed demand response improves the reliability of such resources, which mitigates risk to market operations and grid operations.

2008: Interagency Vision for Demand Resources

[8] R.07-01-041, Order Instituting Rulemaking regarding policies and protocols for demand response load impact estimates, cost-effectiveness methodologies, megawatt goals and alignment with California Independent System Operator Market Design Protocols

[9] Assigned Commissioner's and Administrative Law Judge's Ruling Revising Phase 2 Activities and Schedule, October 1, 2007.

In 2008, an update to the 2003 draft interagency vision was developed by staff from the Commission, CEC, and CAISO and refined through stakeholder feedback.[10] The 2008 update reflects advances in technology and progress made towards the qualitative goals described in the 2003 version, but the overall ethos of the vision remained unchanged.

The 2008 draft interagency vision statement included an expanded view of who can serve as a demand response provider. These included investor-owned utilities (IOUs), non-IOU load-serving entities like electric service providers and community choice aggregators, other third-party providers, and large customers capable of participating directly in the CAISO wholesale markets.

The 2008 objectives emphasized the role of demand response in reducing peak demand and overall electricity costs, improving grid reliability at various levels, supporting environmental goals by integrating with intermittent renewables, and empowering customers through dynamic pricing. Importantly, both the 2003 and 2008 vision statements explicitly excluded the use of fossil-fueled backup generators from the definition of demand response.

The 2008 guiding principles promoted default enrollment of customers in time-varying rates and encouraged the deployment of advanced metering and automated demand response technologies to minimize customer burden. They also called for customer-authorized access to energy usage data, preferential procurement of cost-effective demand response by load-serving entities, and competitive, transparent demand response markets. Ongoing evaluation of demand response efforts was deemed essential, as was strong coordination among the Commission, CEC, and CAISO across key policy areas to ensure the effectiveness and alignment of demand response initiatives.

2016: Goal and Principles for Demand Response

In D.16-09-056 in R.13-09-011[11] the Commission formally adopted a goal and six broad principles for all demand response programs which are subject to Commission regulation. The adopted goal and principles were largely consistent with the earlier interagency vision statements from 2003 and 2008.[12]

Goal

[10] California Demand Response: A Vision for the Future. Draft issued for discussion June 11, 2008.
[11] Order Instituting Rulemaking to Enhance the Role of Demand Response in Meeting the State's Resource Planning Needs and Operational Requirements.
[12] D.16-09-056, Ordering Paragraphs (OP) 7 and 8.

Commission regulated demand response programs shall assist the State in meeting its environmental objectives, cost-effectively meet the needs of the grid, and enable customers to meet their energy needs at a reduced cost.

Principles

- Demand response shall be flexible and reliable to support renewable integration and emission reductions;
- Demand response shall evolve to complement the continuous changing needs of the grid;
- Demand response customers shall have the right to provide demand response through a service provider of their choice and Utilities shall support their choice by eliminating barriers to data access;
- Demand response shall be implemented in coordination with rate design;
- Demand response processes shall be transparent; and
- Demand response shall be market-driven leading to a competitive, technology-neutral, open market in California with a preference for services provided by third-parties through performance-based contracts at competitively determined prices, and dispatched pursuant to wholesale or distribution market instructions, superseded only for emergency grid conditions.

2. Updated Guiding Principles

Building upon the existing Commission objectives, and the overarching goals of the Commission for demand response to be a consistent, predictable, reliable and cost-effective resource that supports California's energy and environmental goals, Energy Division proposes to update the demand response guiding principles based on the following core values.

I. Predictability and Reliability

The California Legislature, the Commission, the CEC and the FERC have all recognized the critical role of demand response in: ensuring system reliability; avoiding high energy prices;

and enabling the integration, utilization, and participation of behind-the-meter distributed energy resources in California's energy landscape.[13]

It is critical for demand response resources to be predictable and reliable because demand response is incorporated into the State's forecasting and planning frameworks and the State relies on demand response resources as dependable capacity for both system planning and real-time grid operations.

If demand response performance is inconsistent or unpredictable, it jeopardizes grid reliability, triggers emergency procurement of costly backup resources, and erodes confidence in the capability of demand response resources to play a significant role in achieving the State's energy and environmental goals.

Ensuring that demand response resources deliver as expected is especially critical as the State moves toward greater electrification and increased use of behind-the-meter distributed energy resources. Without confidence in its performance, demand response cannot be counted and relied on as a true grid resource.

Building on this core value, Energy Division proposes the following updated guiding principle:

> *Demand response shall be **predictable and reliable** in order to be incorporated into the State's forecasting and planning frameworks and be depended on in both system planning and real-time grid operations.*

II. Standardization and Consistency

To enhance the reliability of demand response resources it is important to establish consistent terminology, standard methodologies and common evaluation metrics to ensure that all stakeholders operate within a shared understanding, leading to better coordination, increased participation, and more reliable outcomes.

[13] Public Utility (PU) Code 454.5(b)(9)(C)(i); PU Code 380; Energy Action Plan, May 8, 2003; SB 846 Load Shift Goal Report, May 26, 2023; FERC Order 719, "Wholesale Competition in Regions with Organized Electric Markets," October 17, 2008; FERC Order 745-A, "Demand Response Compensation in Organized Wholesale Electricity Markets," December 15, 2011; and FERC Order 2222, "Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators," September 17, 2020.

Standard valuation methodologies and evaluation metrics allow for apples-to-apples comparisons across programs. This is crucial for accurately valuing demand response resources in system planning and grid operation as well as conducting evaluation, measurement, and verification based on consistent performance metrics. Without them, results lack comparability and credibility.

a. Standard Valuation Methodologies and Evaluation Metrics

The ability to accurately estimate resource capability and measure the load impact provided by demand response resources is critical in strengthening and expanding the effectiveness of demand response in the State's planning and procurement framework.

Standard and consistent counting methodologies allow for apples-to-apples comparisons across programs. This is crucial for accurately valuing demand response as a resource considered in system planning.

Similar to valuation metrics, it is important to adopt consistent evaluation, measurement, verification methodologies and performance metrics. Without them, results lack comparability and credibility. Moreover, inconsistent valuation methodologies and performance metrics create unintended redundancy, misalignment, risks to system reliability, and increased costs to ratepayers.

b. Standard Data Formats, Communication Protocols and Data Access Processes

Standard data formats and architectures and standard communication protocols for transmitting data, such as customer interval consumption data and dynamic price signals, are essential to ensure scalability, efficiency, and interoperability across the energy ecosystem.

Without standardization, utilities, aggregators, technology providers and consumers face additional integration costs, increased risk of errors, and delays in delivering value to the grid, the ratepayers and the customers. Standardized protocols enable seamless communication between systems, reduce vendor lock-in, and support faster deployment of demand-side programs, and dynamic price signals. As highlighted by the US Department of Energy, "[e]nsuring system reliability requires a secure, end-to-end communications pathway capable of handling the information requirements of the modern grid, linking stakeholders across the generation sector, the transmission system, the distribution system, and the grid

edge."[14] Interoperability and standardized communication protocols minimize risk, avoid vendor lock-in, and provide ease of upgrades, and scalability.[15]

Building on this core value, Energy Division proposes the following updated guiding principle:

> ***Standard and consistent*** *valuation methodologies and evaluation metrics, along with standardized data formats, communication protocols, and data access processes, shall be adopted to enhance the transparency, comparability, and effectiveness of demand response resources and programs across the State.*

III. Cost-effectiveness

Statute requires the IOUs and Publicly Owned Utilities first meet their resource procurement needs through all available energy efficiency and demand reduction resources that are *cost effective*, reliable, and feasible.[16],[17]

The 2003 and 2008 interagency Vision Statements both feature cost-effectiveness as a crucial component of demand response program design. The 2008 update succinctly stated as an objective that, "[d]emand response activities and infrastructure should be designed to be cost-effective." The Commission has also affirmed that Commission-jurisdictional demand response resources shall assist the State in meeting its environmental objectives, cost-effectively meet the needs of the grid, and enable customers to meet their energy needs at a reduced cost. [18]

On October 30, 2024, Governor Gavin Newsom issued Executive Order N-5-24, issued on which requests that the Commission take concrete steps to improve the affordability, reliability, and safety of electric service for all Californians.[19]

As demonstrated in the Commission's response to this Executive Order,[20] and as described at length in the most recent demand response budget authorizations,[21] the cost-effectiveness of demand response programs is a paramount concern. In alignment with the Governor's

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[14] U.S. Department of Energy, "Secure Communications Interoperability Challenges in the Power Grid," 2023, at 2.
[15] U.S. Department of Energy, "Guidelines for Next-Generation Grid Communications Architecture" 2024, at 4.
[16] PU Code section 454.5(b)(9)(C)(i)
[17] PU Code section 9615
[18] D.16-09-056, Ordering Paragraphs (OP) 7 and 8.
[19] Executive Order N-5-24, issued October 30, 2024
[20] CPUC Response to Executive Order N-5-24, issued February 18, 2025, at 31.
[21] D.23-12-00, at 7-17, 74-75, 162,

Executive Order, it is imperative that demand response resources in California demonstrate clear value by delivering measurable system and consumer benefits.

In addition, Similar to the established regulatory principle that utility capital assets should be used and useful in order to be eligible for cost recovery[22], in order for demand response resources to be cost-effective they must result in real, measurable load reductions in response to the economic and/or reliability signals that indicate when the resources are needed. A demand response resource that is not consistently available and doesn't reliably respond to the appropriate economic and reliability signals is not a cost-effective resource.

Building on this core value, Energy Division proposes the following updated guiding principle:

> *Demand response resources in California shall be **cost-effective** and demonstrate clear value by delivering measurable system and ratepayer benefits.*

IV. Supporting California's Energy and Environmental Goals

The California Legislature, the Commission, the CEC, and the FERC have all recognized the critical role of demand response in ensuring system reliability; avoiding high energy prices; supporting renewable energy integration, and advancing California's ambitious energy and environmental goals.[23]

Demand response plays a crucial role in integrating renewable energy by making electricity demand more flexible to match the variable nature of clean energy sources like solar and wind. By responding to grid conditions, demand response supports renewable energy integration, enhances system flexibility and reliability while reducing strain on the grid and the grid emissions. However, it is important to note that demand response can only support

[22] Pub. Util. Code § 454.3 and § 454.8

[23] Pub. Util. Code § 454.5(b)(9)(C)(i); Pub. Util. Code § 380; Energy Action Plan, May 8, 2003; SB 846 Load Shift Goal Report, May 26, 2023; FERC Order 719, "Wholesale Competition in Regions with Organized Electric Markets," October 17, 2008; FERC Order 745-A, "Demand Response Compensation in Organized Wholesale Electricity Markets," December 15, 2011; and FERC Order 2222, "Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators," September 17, 2020.

California's energy and environmental goals if it performs consistently and reliably. The 2003 and 2008 interagency Vision Statements clearly stated that[24]:

a. Demand response can reduce greenhouse gas and other emissions by reducing the need to dispatch inefficient fossil fuel peaker plants, and
b. Definition of demand response does not include the shifting of customer load from grid power to fossil fuel auxiliary or emergency backup generators.

The Commission has consistently rejected the use of fossil fuel resources to simulate demand response.[25] We must continue to support demand response programs and rates that do not inadvertently create an incentive for customers to shift on-site load to fossil fuel resources, so that demand response in California remains a truly clean resource.

Building on this core value, Energy Division proposes the following updated guiding principle:

> *Demand response resources and programs shall continue to support California's* ***energy and environmental goals*** *and prohibit use of fossil fuel generation except under strictly limited conditions.*

3. Conclusion

California's current and future energy landscape and the grid's growing reliance on demand response resources make it critical to ensure that demand response resources be:

I. Predictable and reliable,
II. Subject to standard and consistent valuation methodologies and evaluation metrics and data processes,
III. Cost-effective, and
IV. Aligned with California's energy and environmental goals.

Building upon these core values, Energy Division recommends the following updated guiding principles:

[24] D.03-06-032, Att. A at 2; June 11, 2008 California Demand Response: A Vision for the Future, at 4: "The definition of demand response does not include or encourage switching to use of fossil-fueled auxiliary or emergency backup generation."
[25] D.05-01-056 Conclusion of Law 23; D.06-11-049, at 58; D.09-08-027, at 166; D.11-10-003, at 29; D.14-12-024, OP 10 & 11; D.16-09-056, OP 3.

1. Demand response shall be **predictable and reliable** in order to be incorporated into the State's forecasting and planning frameworks and be depended on in both system planning and real-time grid operations.

2. **Standard and consistent** valuation methodologies and evaluation metrics, along with standardized data formats, communication protocols, and data access processes, shall be adopted to enhance the transparency, comparability, and effectiveness of demand response resources and programs across the State.

3. Demand response resources in California shall be **cost-effective** and demonstrate clear value by delivering measurable system and ratepayer benefits.

4. Demand response resources and programs shall continue to support California's **energy and environmental goals** and prohibit use of fossil fuel generation except under strictly limited conditions.

The updated guiding principles are intended to strengthen the role of demand response as a dependable and cost-effective resource within California's evolving energy landscape. By reaffirming the foundational goals of grid reliability, ratepayer value, and environmental stewardship, these principles build upon a long history of interagency collaboration among the Commission, CEC, and CAISO. The proposed principles emphasize the need for predictability, standardization, cost-effectiveness, and alignment with California's clean energy policies. Together, these updates provide a clear and actionable framework to ensure demand response remains an integral component of California's energy planning, operations, and decarbonization strategy.