Testimony of Elliot Mainzer, President and Chief Executive Officer,

California Independent System Operator Corporation,

Keeping the Lights On: Examining the State of Regional Grid Reliability

Subcommittee on Energy, Committee on Energy and Commerce,

United States House of Representatives

March 25, 2025

Executive Summary

Like other regions of the country, California has faced extreme weather and other challenges, but the California Independent System Operator (CAISO) and our key partners have made major advances in reliability in recent years due to common sense approaches to expanding energy supply, efficiently interconnecting new resources, and proactively planning for transmission upgrades. New resources are coming online at a rapid pace. Since 2020 over 24 GW of new generation capacity has been added to the CAISO grid, including approximately 7 GW last year. This new capacity includes over 11 GW of battery storage. Based on the CAISO's implementation so far of its new interconnection reforms, there has been a material reduction in projects clogging the CAISO interconnection study process. The CAISO's 2023-2024 Transmission Plan included 26 new projects costing $6.1 billion to support 85 GW of capacity by 2035. Reliability is further enhanced in the West by the operation of the Western Energy Imbalance Market (WEIM), which allows over 22 participating entities to rely on a broad geographic footprint of transmission and generation resources to improve reliability and reduce costs. Working in a state driven process, the CAISO partners with regulators, utilities, developers and other stakeholders to advance reliability and affordability for electricity consumers. Through these partnerships we have realized mutual economic and reliability benefits from planning and operational coordination. The CAISO recognizes that our work continues in order to maintain the pace of new resource development to meet growing electric demands and state policy goals. The CAISO remains focused on implementing its coordinated forward planning process with state agencies and looks forward to further engagement with the federal government to ensure reliability and cost savings.

Written Statement

Chairman Latta, Ranking Member Castor, Chairman Guthrie, Ranking Member Pallone, and Members of the Subcommittee, thank you for the opportunity to testify today. My name is Elliot Mainzer. I serve as President and Chief Executive Officer of the California Independent System Operator Corporation, commonly referred to as the CAISO. For the last 25 years, I have served in various roles working to achieve reliable and affordable energy by supporting innovation and creativity in generation development, transmission planning, market design and regional collaboration. I joined the CAISO in September 2020, after an 18-year career at the Bonneville Power Administration (BPA), including seven years as Administrator and CEO.

The CAISO is a nonprofit public benefit corporation and does not own any generation or transmission lines. We do play a number of key roles to ensure the grid is reliable, including transmission planning, overseeing interconnection of new resources, operation of electricity markets, and providing Reliability Coordinator services to 42 entities operating in the Western Interconnection. Unlike other ISOs/RTOs, we do not operate a centralized capacity market but work with the state and municipal entities to ensure adequate procurement and deployment of generation and storage resources.

Reliability

Like other regions of the country, California has faced extreme weather and other challenges, but the CAISO and our partners have made major advances in reliability in recent years due to common sense approaches to expanding energy supply, efficiently interconnecting

new resources, and proactively planning for transmission upgrades. New resources are coming online at a rapid pace.

Since 2020 over 24 GW of new generation capacity has been added to the CAISO grid, including approximately 7 GW last year. This new capacity includes over 11 GW of battery storage. The CAISO relies on these new resources, as well as a diverse generation mix that includes solar, wind, geothermal, biogas, hydro, storage, natural gas, and nuclear generation. As reflected in figure 1, during the next five years, we expect resource growth to continue to be comprised largely of battery storage, solar, and wind resources.

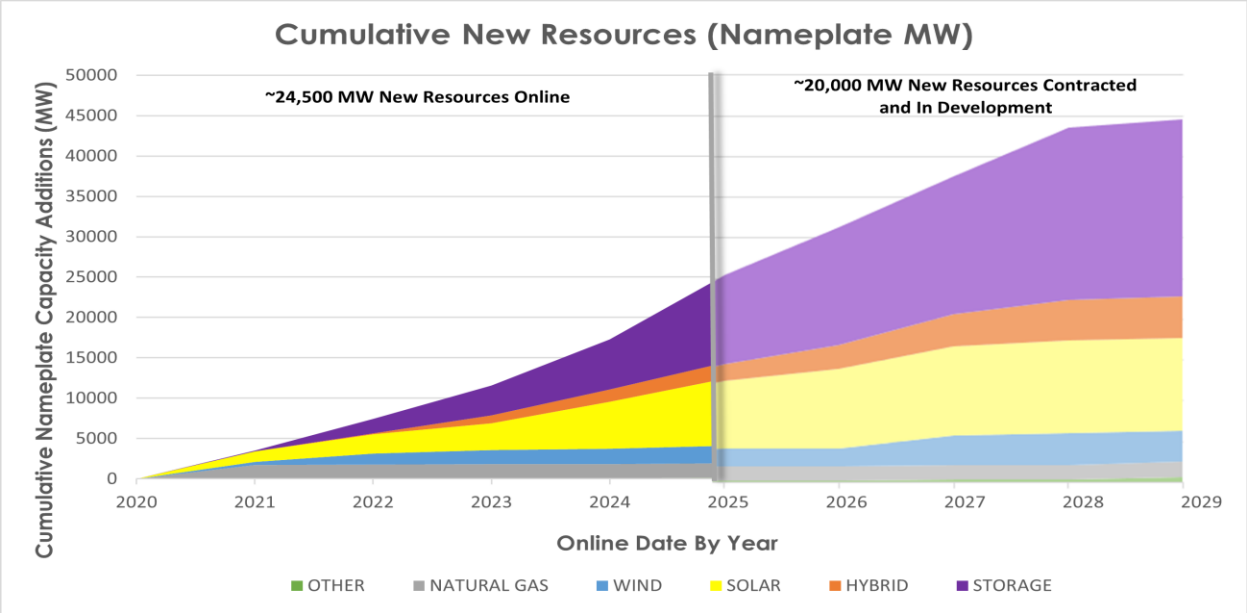

Figure 1. Cumulative new resource additions and projected new resource additions as tracked and reported by the California Public Utilities Commission (CPUC).

The reliability of our grid is also advanced by thoughtful and timely oversight by FERC. Last year, FERC approved a comprehensive set of interconnection reforms resulting from an extensive CAISO stakeholder process. These reforms will help projects aligned with state and local resource plans and located in areas with transmission availability to proceed through the

CAISO interconnection queue. Based on our implementation so far, we have observed a material reduction in projects clogging our interconnection study process.

The CAISO's 2023-2024 Transmission Plan included 26 new projects at an estimated cost of $6.1 billion to support load growth of over 85 GW by 2035. Figure 2 reflects recent transmission developments in the Western United States. These transmission projects will support resources identified in the California Public Utilities Commission's resource planning efforts and increase reliability and foster economic development in the West. Two of these projects, TransWest Express and SunZia, are seeking to participate under the CAISO's novel Subscriber Participating Transmission Owner model to connect out of state resources to the CAISO. Our coordination with adjacent states, utilities, and developers provides a new path to support development across the region.

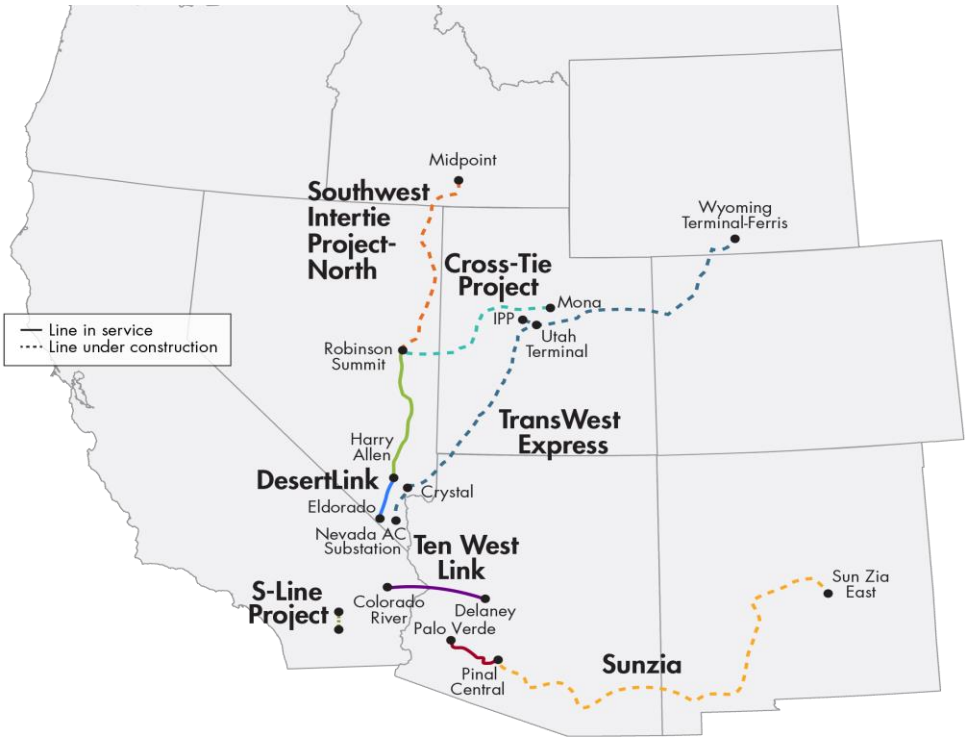

Figure 2. Multi-state transmission projects that deliver west-wide benefits and enhance resilience.

Reliability in the West is further enhanced by the success of the CAISO's Western Energy Imbalance Market (WEIM), which has been in operation since 2014, and optimizes supply in real-time for every fifteen minute interval and then again for every five minute interval across the Western footprint. Enhanced reliability across the region has been achieved because of the large foot print of 22 market participants in ten states. In addition, approximately $7 billion in cost savings have been achieved for electricity customers.

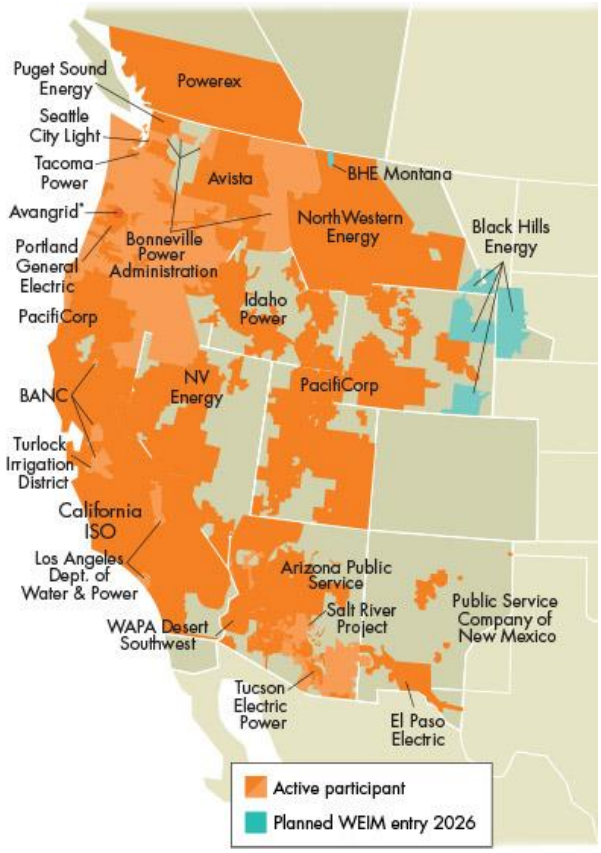

Figure 3. Balancing authorities either currently participating in the Western Energy Imbalance Market or planning to do so.

We are now working to extend our day-ahead market platform to others in the West. Fully approved by the FERC in 2024, the Extended Day Ahead Market will expand the ability to optimize supply and demand in the day-ahead timeframe which will enhance market efficiency and reliability and reduce costs to ratepayers across the West.

State-Driven Process

The CAISO collaborates with California's state agencies and other local regulatory authorities to ensure safe and reliable service to electricity customers. The CAISO, the California Public Utilities Commission (CPUC), and the California Energy Commission (CEC) entered into a memorandum of understanding to improve coordination and to enhance resource and transmission planning to achieve state reliability and policy needs. The CAISO manages the transmission planning and generator interconnection processes, which carefully account for the inputs provided by CEC's demand forecast, the CPUC's integrated resource planning, and additional inputs from non-CPUC jurisdictional local regulatory authorities. All of these processes have a minimum 10 to 15-year horizon, with the CAISO also providing transmission assessments 20 years into the future.

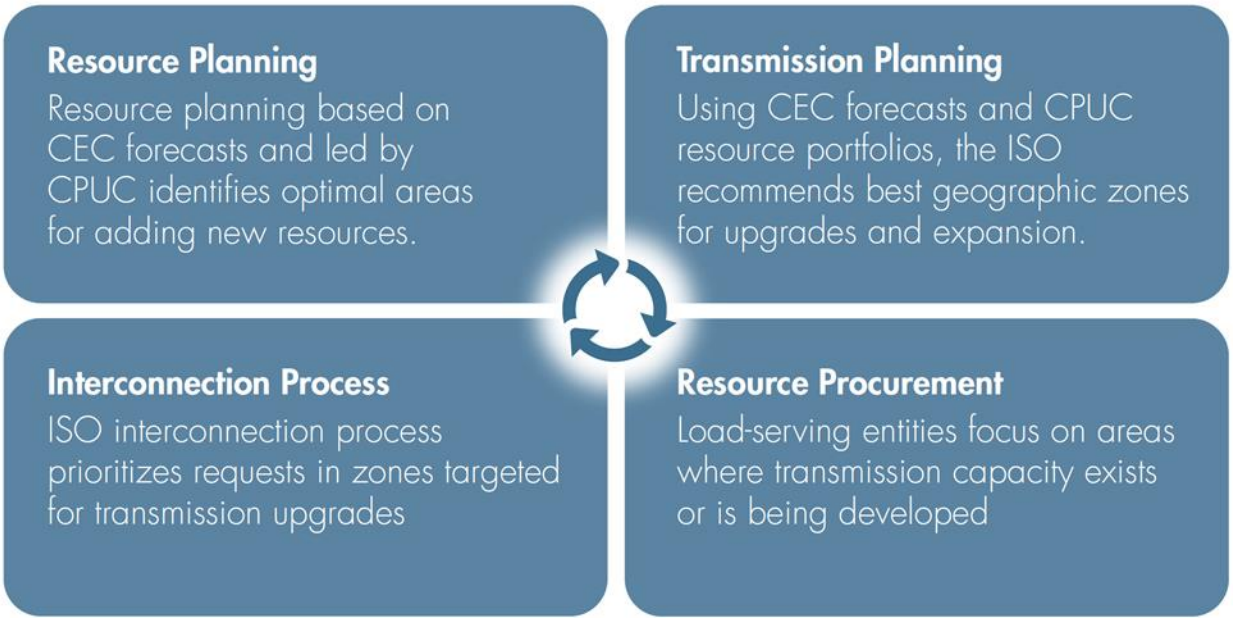

Figure 4. The collaborative process identified in the Memorandum of Understanding signed by the CAISO, the California Public Utilities Commission, and the California Energy Commission.

This coordination has facilitated the addition of thousands of megawatts of new generating capacity and battery energy storage. The CAISO now has over 11 GW of energy storage, one fifth of CAISO's demand, nearly all of which has interconnected in the last few years through the CAISO's interconnection process.

Large Load Growth

Electrification of transportation and buildings has been the primary driver of load growth to date within the CAISO's footprint. The CEC's latest demand forecast shows a 33% growth in peak demand over the next 10 years, and a 45% growth in peak demand over the next 15 years. As the home of Silicon Valley, the CAISO is working diligently to serve emerging large electric loads within our footprint, including major enhancements to the transmission system in Silicon Valley. Currently, there is about 1 GW of data center loads connected to the CAISO system. The CEC projects an increase in data center loads over the next 15 years, with a sharp increase projected to start around the 2028 timeframe. The CEC projects data center load to increase by 2.3 GW by 2030, and 3.3 GW by 2035. In addition to onboarding thousands of megawatts of new generating capacity, the CAISO is also working with our partners in government and industry to increase the role of flexible loads and virtual power plants in supporting reliability within our market footprint, including the potential of securing flexibility services from data centers themselves.

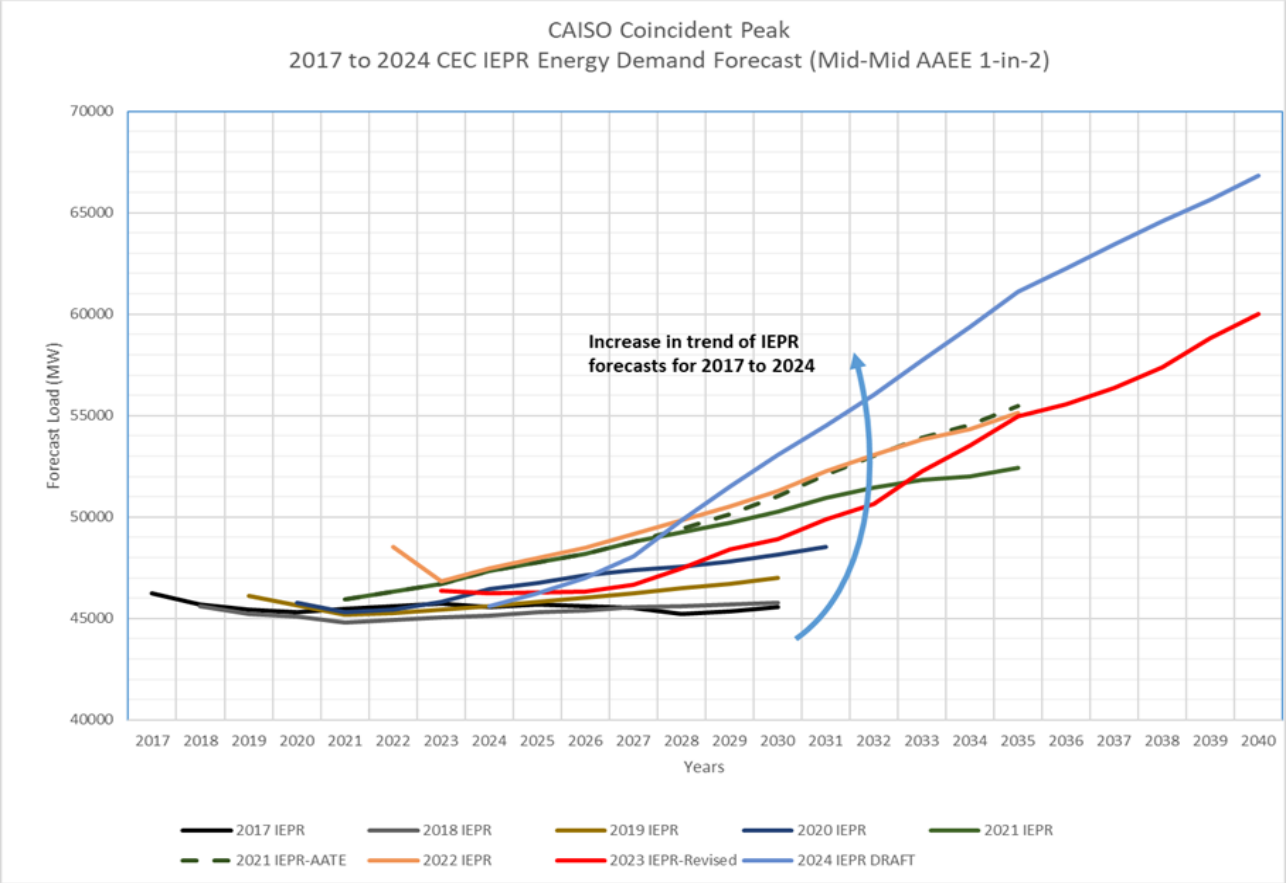

Figure 5. Acceleration of load growth projections from year to year based on the California Energy Commissio n's Integrated Energy Policy Report (IEPR).

Looking Forward

The CAISO recognizes that our work continues in order to maintain the pace of new resource development to meet growing electric demands and state policy goals. The CAISO remains focused on implementing its coordinated forward planning process with state energy agencies and looks forward to further engagement with the federal government to ensure reliability and cost savings for electricity consumers.