

Energy Imbalance Market (EIM)

EIM expansion is the best approach to grid regionalization



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Mission

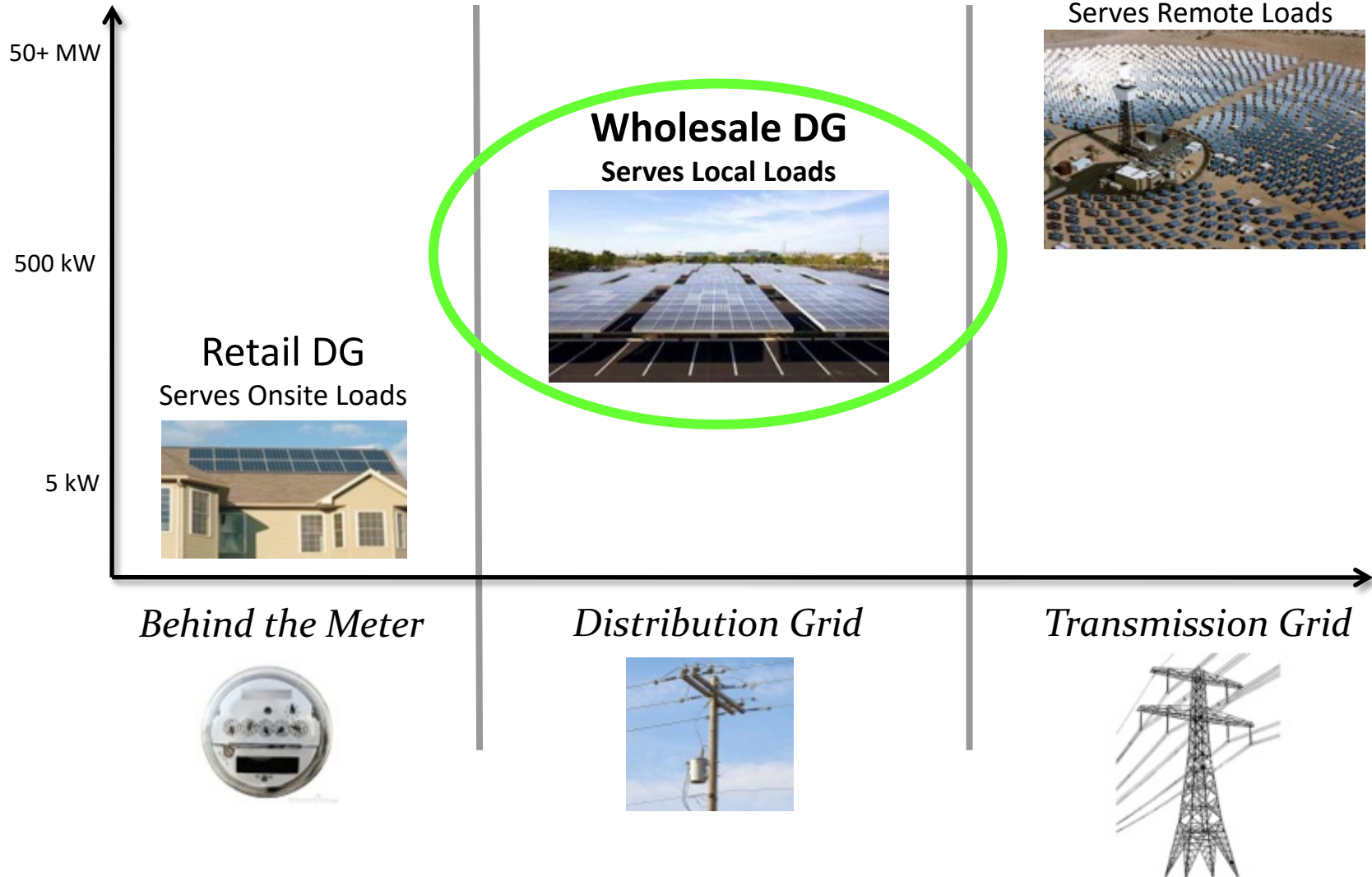
To accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise.

Renewable Energy End-Game

100% renewable energy; 25% local, interconnected within the distribution grid and ensuring resilience without dependence on the transmission grid; and 75% remote, fully dependent on the transmission grid for serving loads.

Wholesale Distributed Generation (WDG) defined

Project Size



A Community Microgrid is a new approach for designing and operating the electric grid, stacked with local renewables and staged for resilience.

Key features:

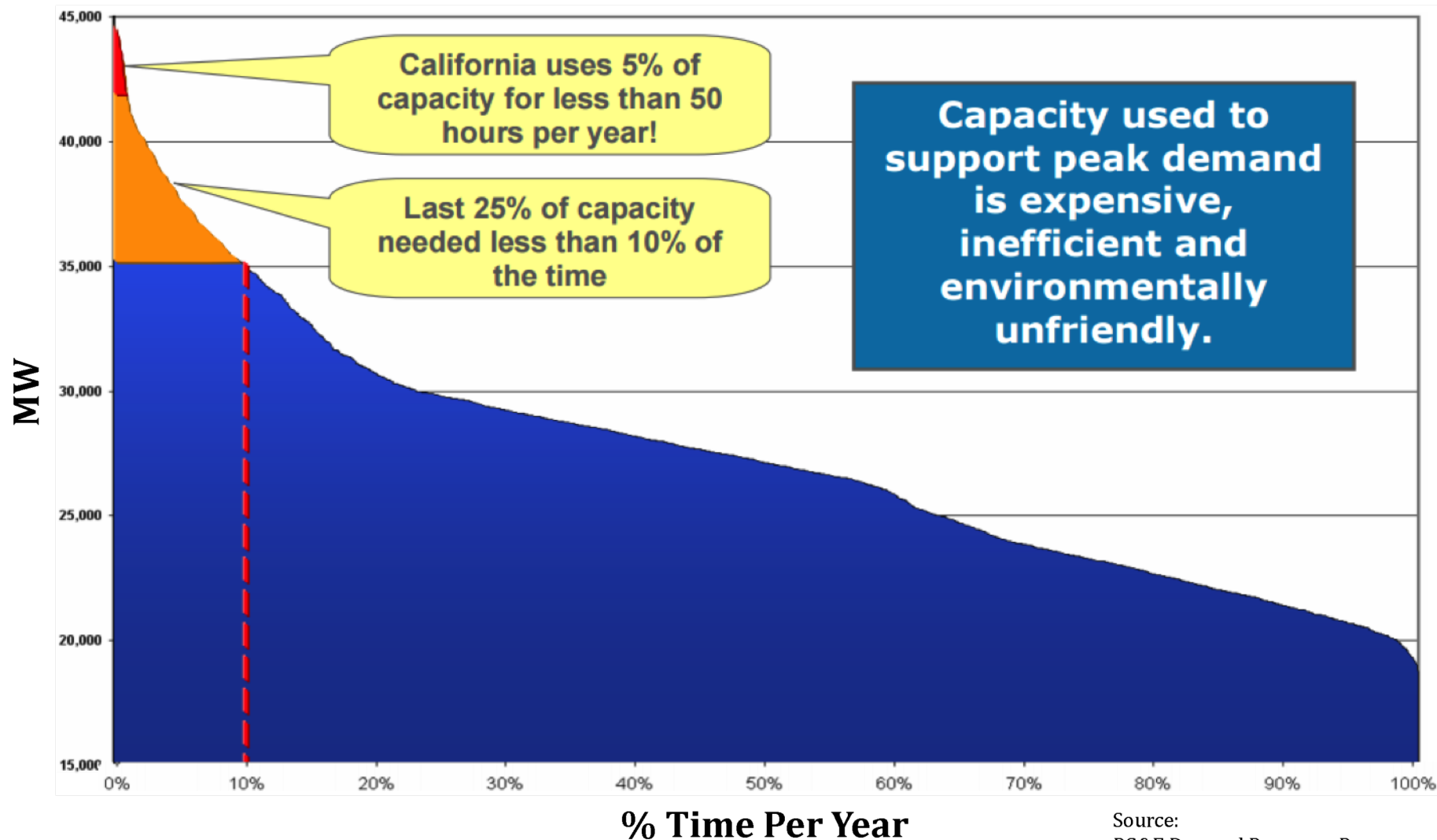
- A targeted and coordinated distribution grid area served by one or more substations – ultimately including a transmission-distribution substation that sets the stage for Distribution System Operator (DSO) performance. gregory.thomson@sunrun.com
- High penetrations of local renewables and other distributed energy resources (DER) such as energy storage and demand response.
- Staged capability for indefinite renewables-driven backup power for critical community facilities across the grid area – achieved by 25% local renewables mix.
- A solution that can be readily extended throughout a utility service territory – and replicated into any utility service territory around the world.



Service	Key to Delivering Service
Power Balancing	<u>Capacity</u> of real power (W)
Voltage Balancing	<u>Location</u> of reactive power (VAr)
Frequency Balancing	<u>Speed</u> of ramping real power (W)

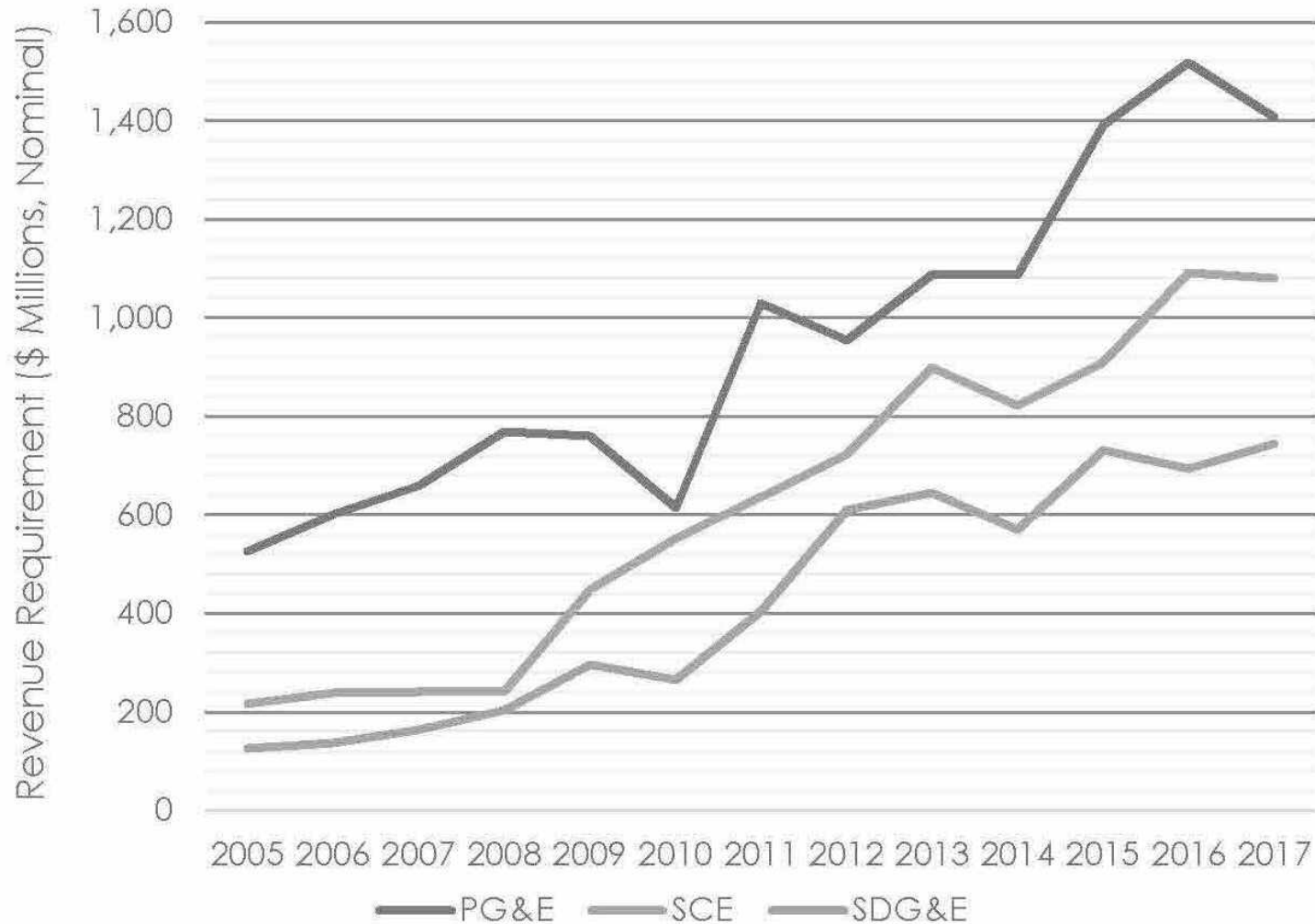
The Duck Chart only addresses Power Balancing but Distributed Energy Resources deliver unparalleled location and speed characteristics

Transmission Grid Load Duration Curve

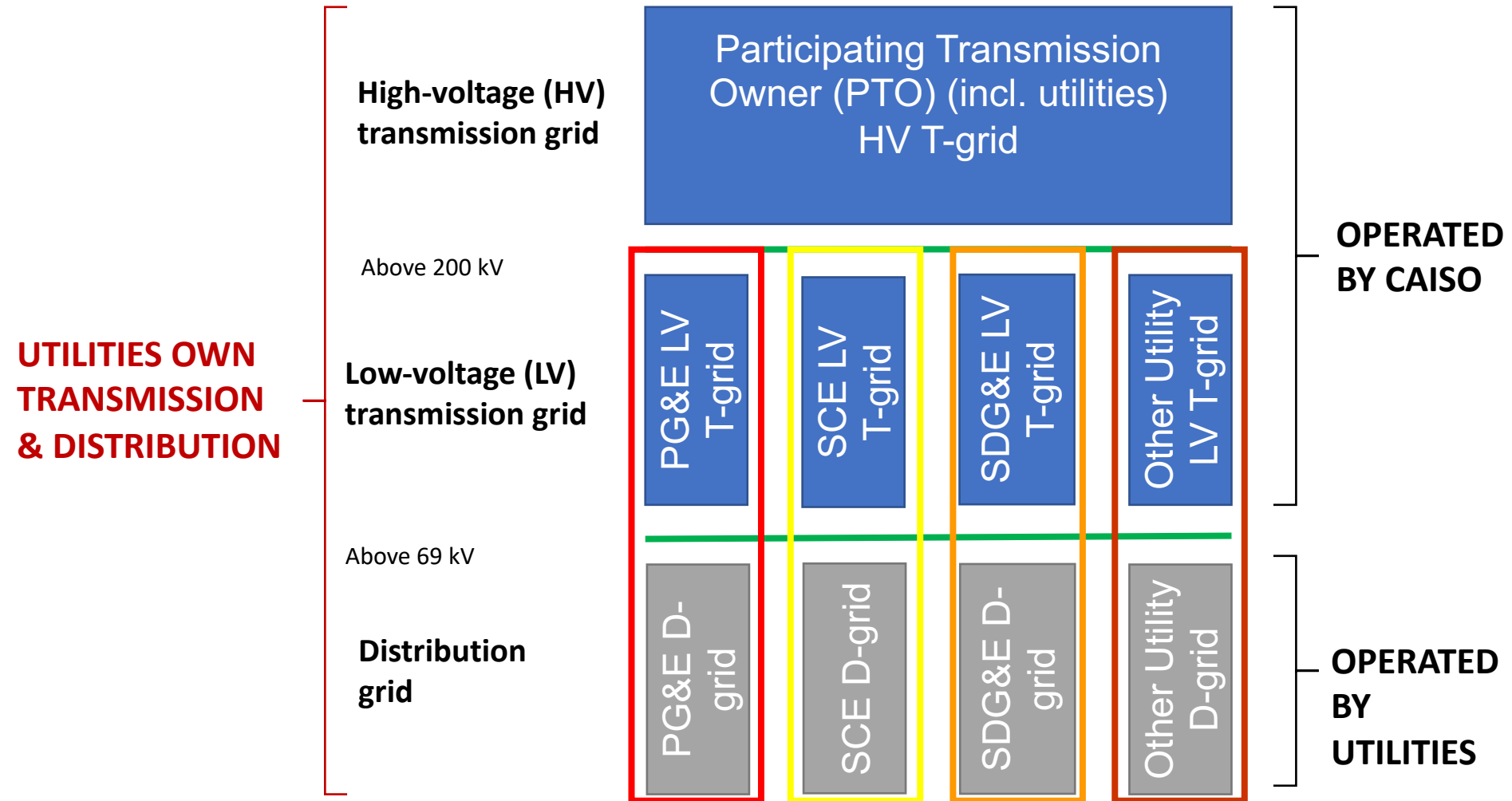


Source:
PG&E Demand Response Programs:
An Overview, November 17, 2009

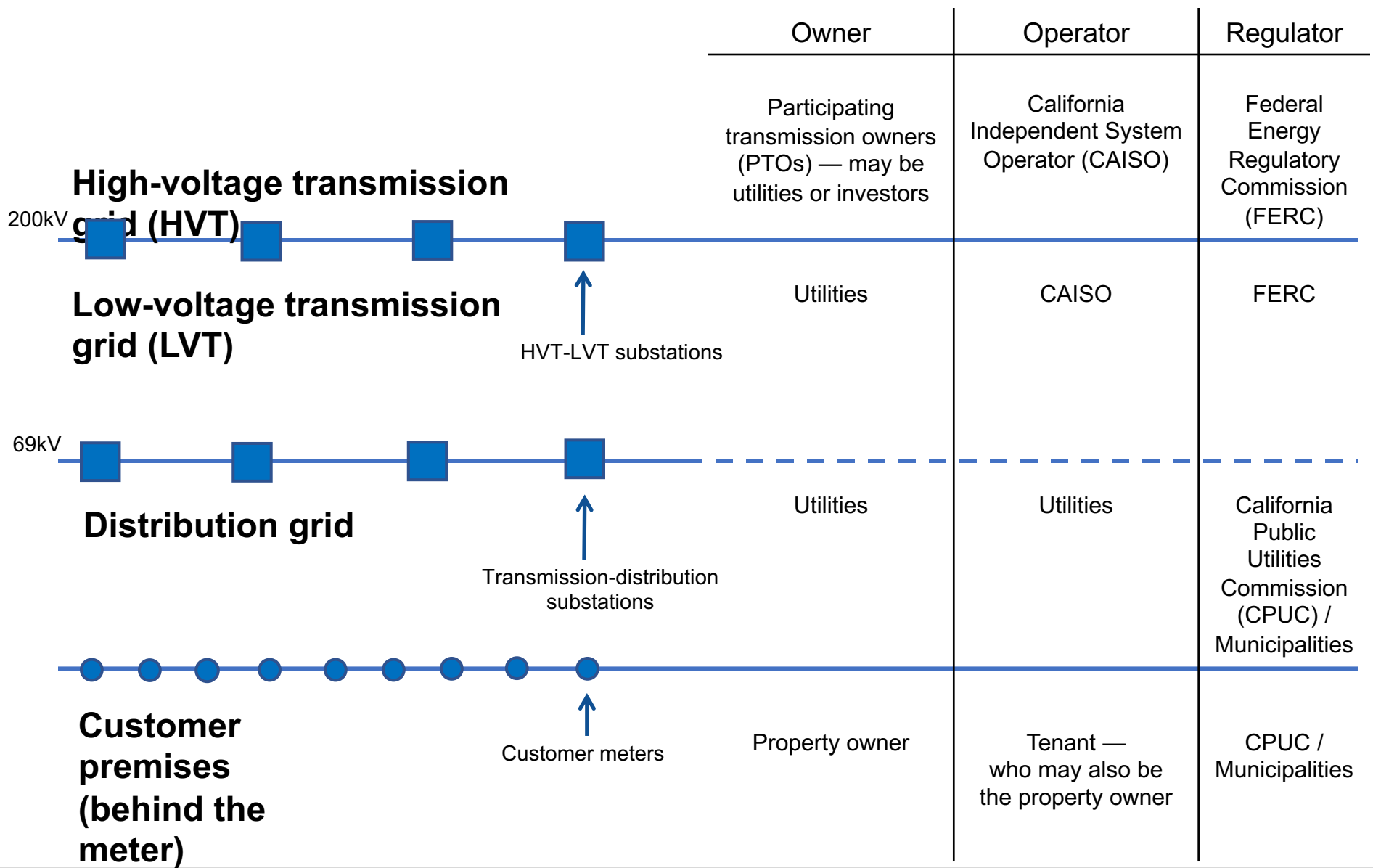
Figure 3.6: Trends in Transmission Revenue Requirement²²



Transmission and distribution facilities



Who owns, operates, and regulates the power grid



proposal: Restructuring to improve competition and

Transmission and distribution facilities

Only Participating Transmission Owners own transmission assets

BRIGHT LINE
↓

High-voltage (HV) transmission grid

Above 200 kV

Low-voltage (LV) transmission grid

Above 69 kV

Participating Transmission Owner (PTO)

HV T-grid

LV T-grid

LV T-grid

LV T-grid

LV T-grid

OPERATED BY CAISO

Utilities own & operate distribution only

Distribution grid

PG&E D-grid

SCE D-grid

SDG&E D-grid

Other Utility D-grid

OPERATED BY UTILITIES

- [Transmission Access Charges \(TAC\)](#) in California are assessed inconsistently and unfairly, creating a massive market distortion
 - In PTO utility service territories, California ratepayers pay the same charge for “using” the transmission system whether or not the energy they use travels across that system
- The TAC market distortion has hidden costs:
 - Californians could pay up to \$60 billion extra over the next 20 years
 - 3 cents per kWh is being stolen from clean local energy projects — 50% of their total cost — making them look more expensive than they really are
 - Fewer \$\$ are available for the resilience that Community Microgrids bring our communities
- The Clean Coalition is proposing this reform: Charge for electricity transmission based on actual use of the transmission grid
 - This method is already being used successfully by California’s municipal utilities

