

TerraVerde
ENERGY

Independent Energy Advisors

Booth #403

Tony Pastore | Senior Advisor

Energy Infrastructure Procurement ACWA Fall Conference 2025



Bringing Water Together

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Thank you!

- **Dennis Cafferty, GM, El Toro Water District**
- **Marc Serna, AGM, South Coast Water District**
- **Craig Hayes, Partner, BBK Law**
- **Ali Chehrehsez, CEO, TerraVerde Energy**

- Public agency **owner's advisor** for over 15 years
- ACF, analysis, feasibility, optimization, competitive procurement, O&M
- Deliver **microgrids**: solar, battery, linear generators, CHP, EV charging

160+ Public Agency
clients

600+ SYSTEMS
deployed & managed

> \$1 BILLION
in projects



What is energy infrastructure?

- **Solar**
- **Battery**
- **CHP**
- **Linear Generators**
- **EVs and Chargers**
- **Optimizers > Smart controls, VFD, SMC, etc**

Onsite Electricity Generation and Storage

Solar



Battery



CoGen, CHP



Fuel Cell

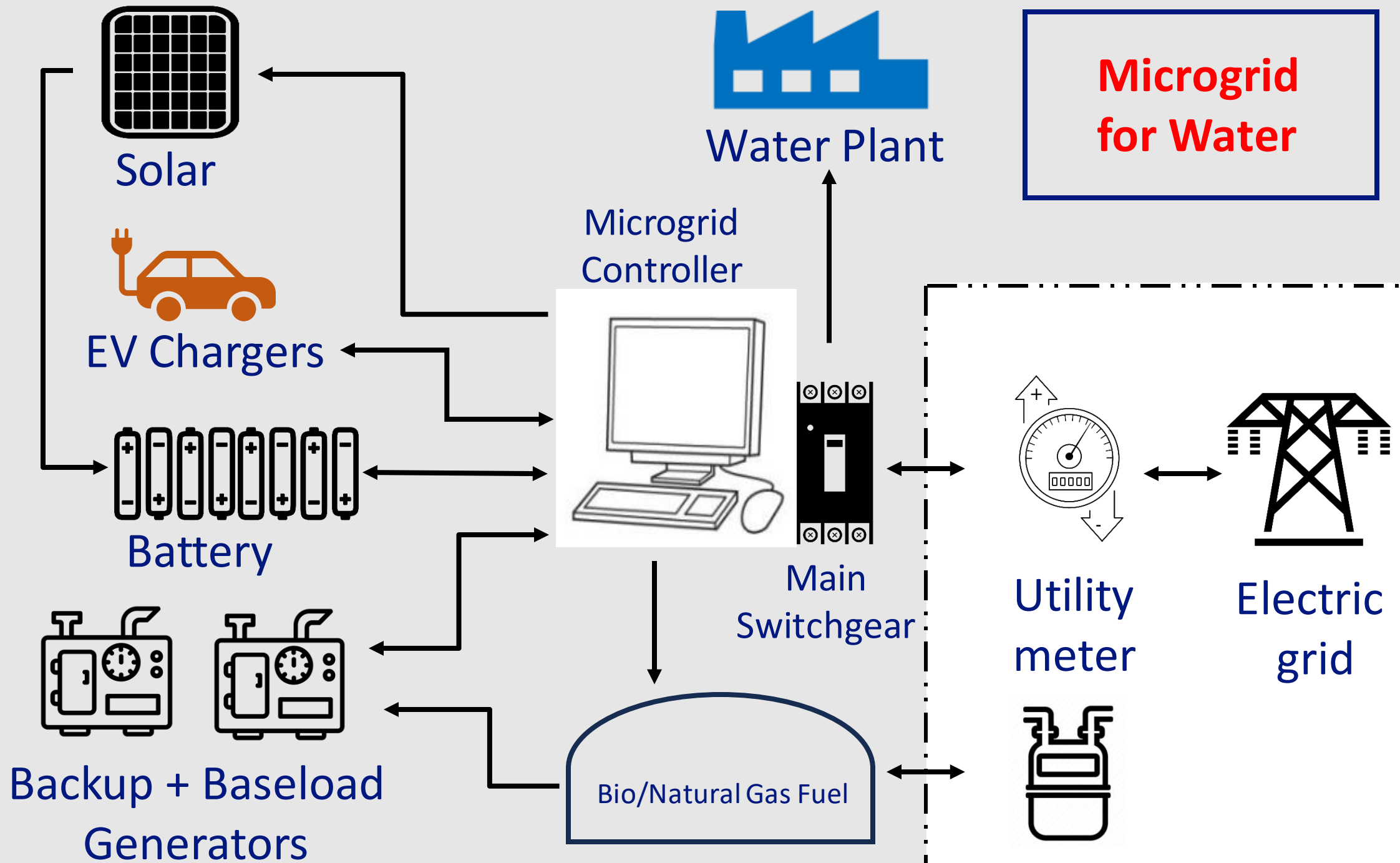


Linear Generator



EVs & Chargers



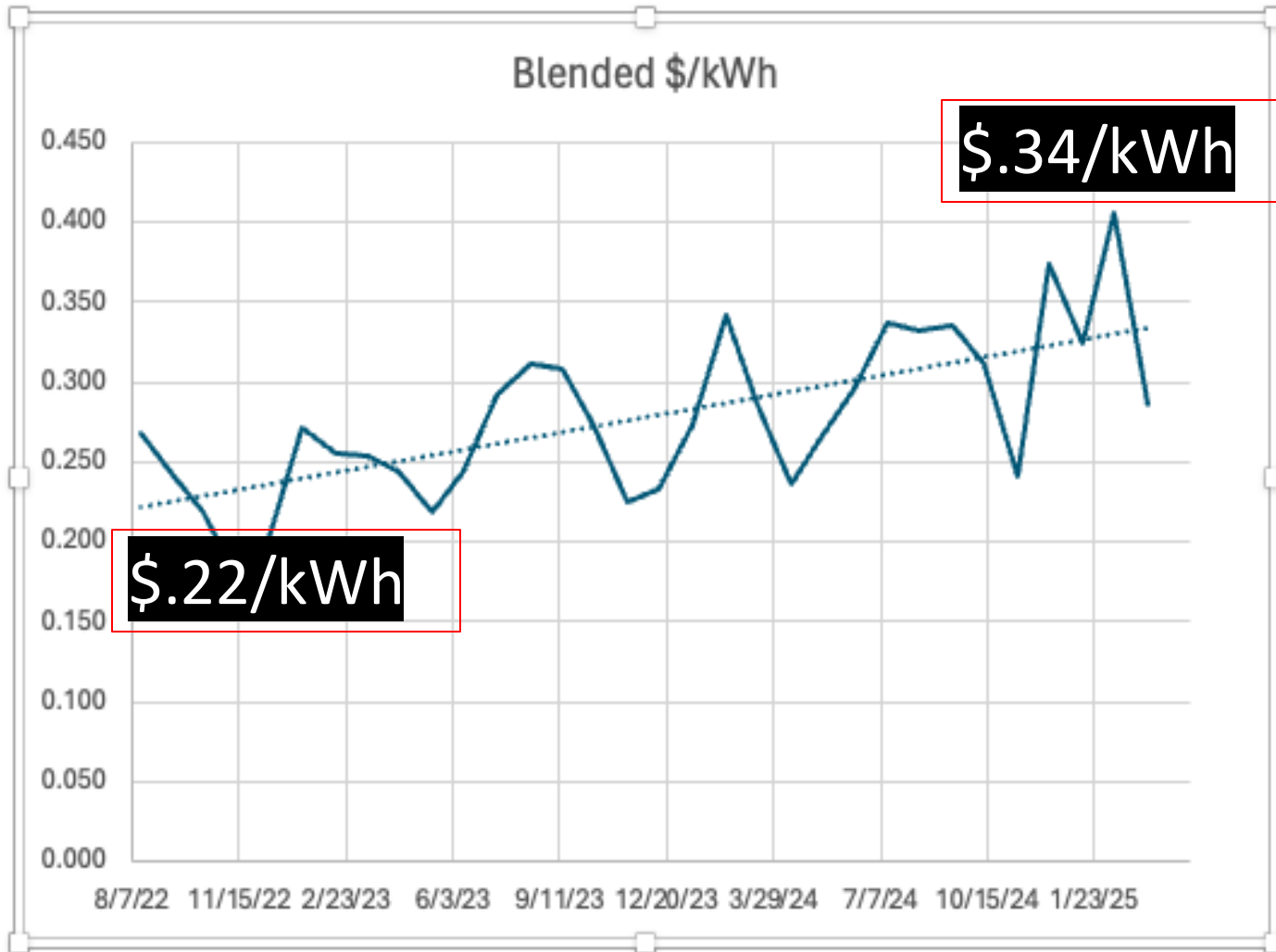


Why is energy infrastructure important?

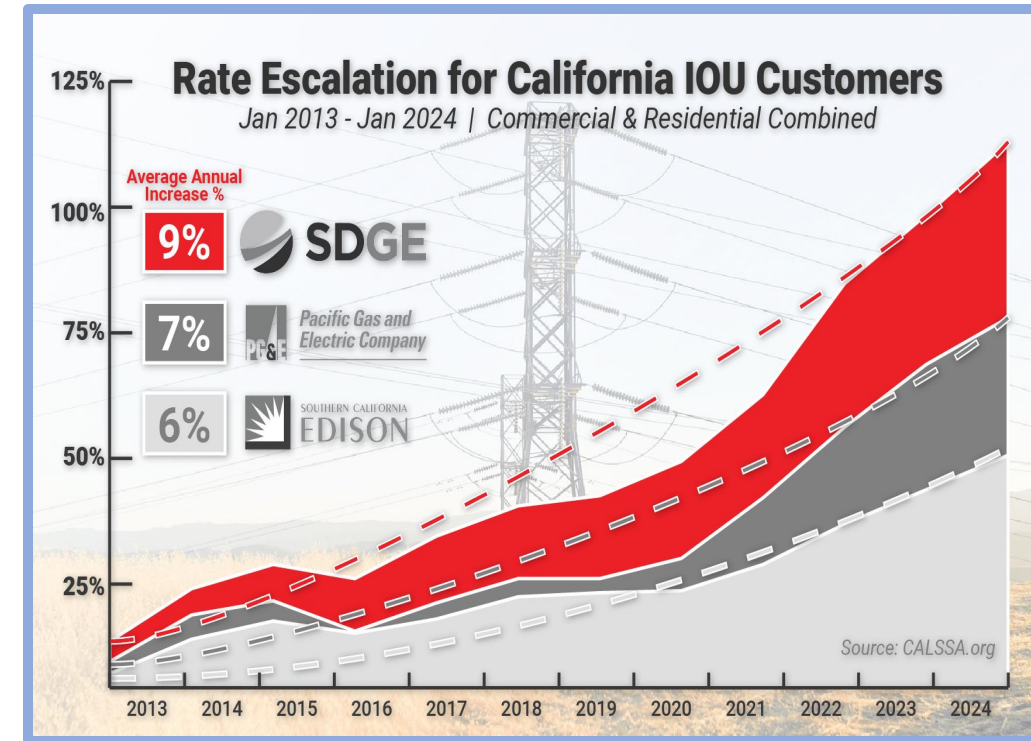
- **Reduce operating expenses**
- **Ensure operational reliability**
- **Energy Independence & GHG Reduction**

SAMPLE WATER AGENCY

PG&E 29 month (2.5 yr) = 64% cost increase per kWh

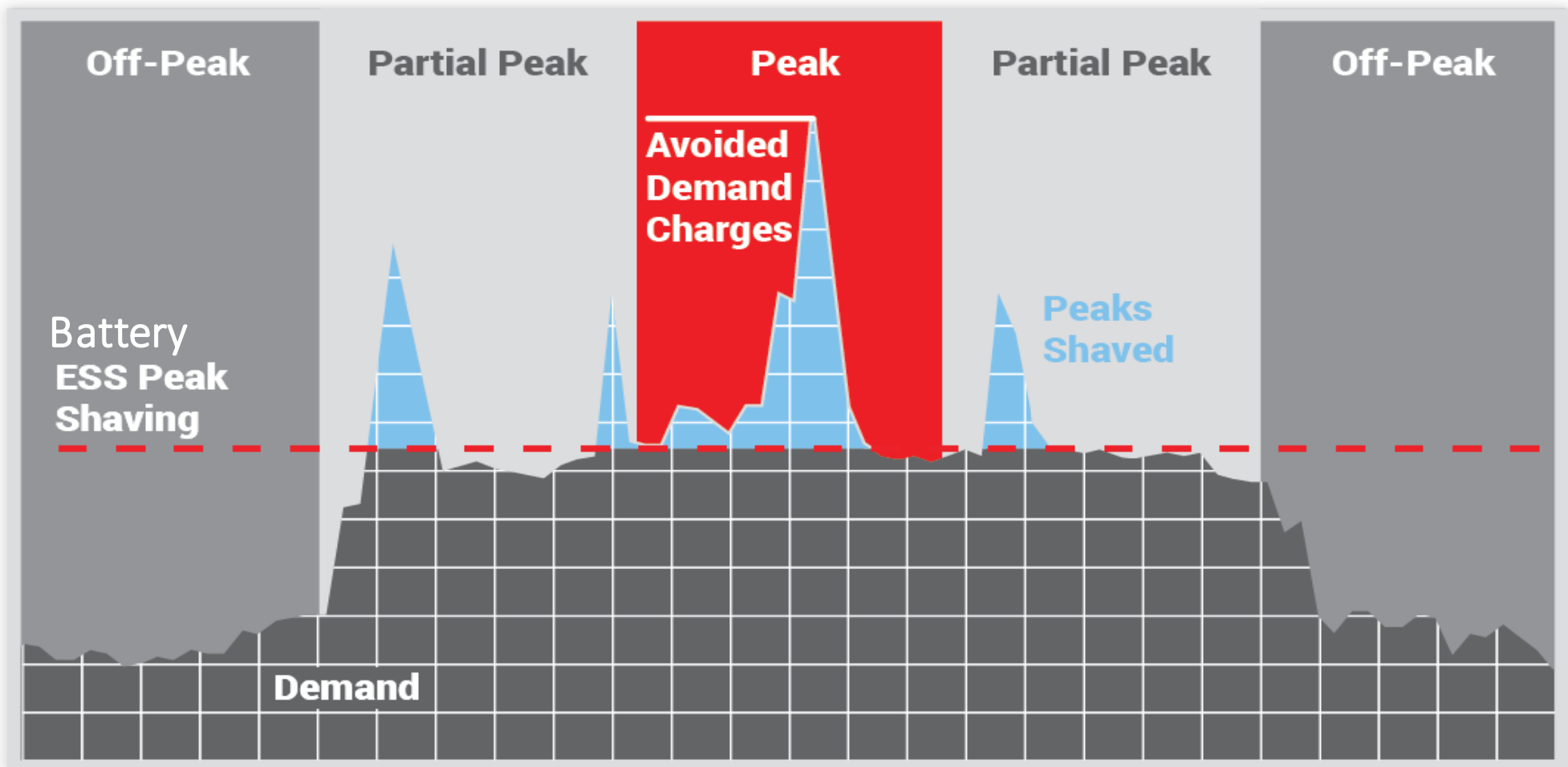


10-year PG&E Avg. Escalation = 7%/yr



Microgrids (onsite generation and storage) create load “flexibility” to avoid TOU peak period cost and/or demand charges (peak shaving).

Demand charges can be more than **40%** of electricity costs.



THE WORLD'S FUTURE ENERGY SUPPLY

2050F

RENEWABLES

2035F

SOURCE IEA - WORLD ENERGY OUTLOOK 2025. TOTALS MAY VARY SLIGHTLY BECAUSE OF ROUNDING.

2024

EXAJOULES EJ
193 30% SHARE OF ENERGY SOURCE

192 27%

OIL

184 25%

NATURAL GAS

165 23%

161 22%

Solar grows 1000% by 2050 - from about 1% to 11% of global energy generation.

178 27%

95 13%

148 23%

91 12%

OTHER

65 9%

SOLAR

79 11%

43 6%

NUCLEAR

40 6%

WIND

61 8%

HYDRO

25 4%

TRADITIONAL BIOMASS

40 5%

19 3%

2024

2035F

2050F

18 3%
16 2%
9 1%
9 1%

700

600

500

400

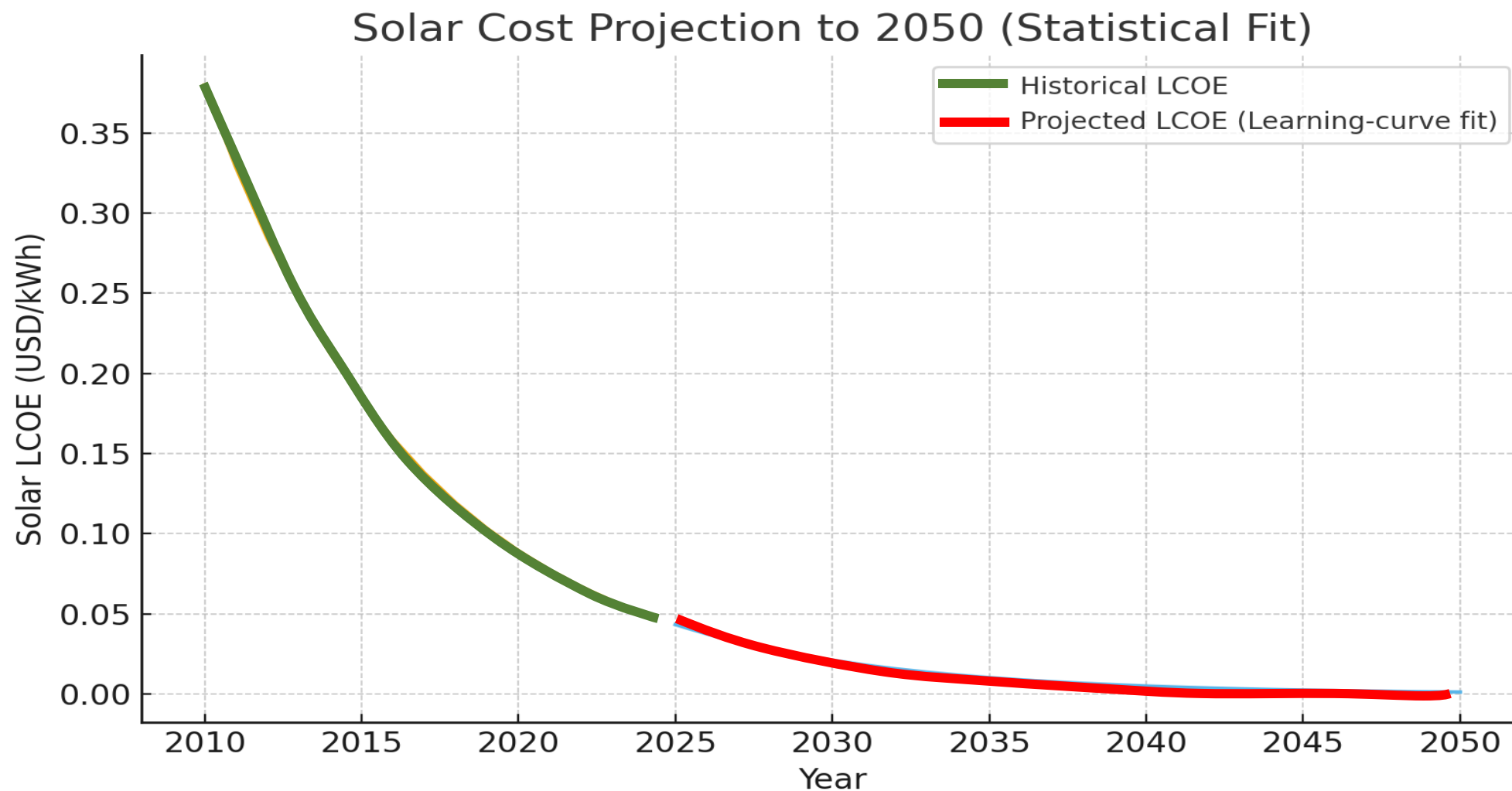
300

200

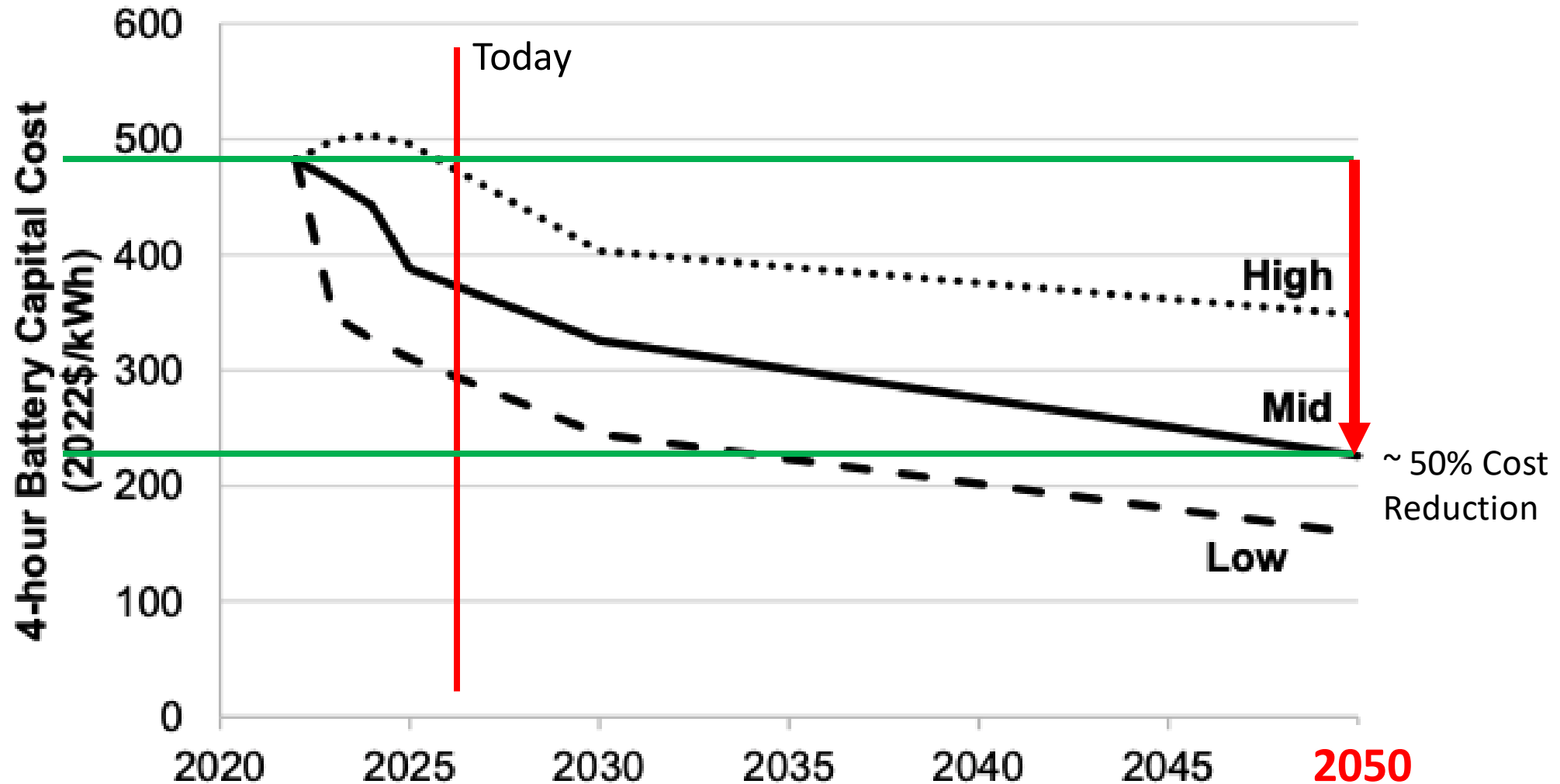
100

23 3%
10 1%

Solar LCOE Projection \$/kWh



Battery Energy Storage Cost Projection \$/kWh



PSPS Events - More frequent and longer

FPI AND WINDSPEED CRITERIA REFINEMENTS

- Updated application of FPI when broader fire weather concerns identified
- When new FPI criteria applied, suggests 20-40% more PSPS activation days and event size is up to twice as large in 2025 assuming similar weather to 2024
- Refined application of windspeed discount factors

NEW HFRA CIRCUITS AND EXPANDED BOUNDARIES

- 32 new circuits and ~47,000 more customer accounts now in HFRA and in scope for PSPS
- Expanded precautionary boundaries around HFRA; up to ~123,000 more customer accounts could be in scope for PSPS
- Includes areas and customers that have not experienced PSPS in the past

24/7 MONITORING AND ALERT SYSTEM

- Capturing unexpected weather (outside of current PSPS activation) meeting PSPS de-energization thresholds
- Circuits could be de-energized immediately at any time, day or night
- IMT activation and notifications would follow

How do agencies get Energy Infrastructure?

- ***Procurement and Contracting***
- ***For your reference***

Procurement Pathways

Pathway	Advantages	Considerations / Risks
Design-Build GC 4217 (Energy Service Contracts)	• Rapid; Board resolution replaces low-bid process. • Energy cost-savings, renewables, microgrid projects. • Allows energy, O&M, and performance guarantees. • Good for District-owned projects. • Relies on qualifications and “Best Value”	• Requires verified cost-avoidance findings. • Limited to energy-related scopes (civil/fiber work may need separate bid). • Not ideal for complex revenue-sharing or multi-agency structures.
Design-Bid-Build (PCC §§ 20160-20465)	• Traditional Public Contract Code procurement model. • Ensures transparency and fairness through competitive low-bid process. • Provides District with design control and clearly defined roles between designer and contractor. • Best for well-defined scopes i.e. electrical site work, conduit installation, or switchgear foundations.	• Sequential process extends overall schedule (design must be 100% complete before bid). • Limited contractor input during design limits opportunities for innovation & VE. • Change orders typical when conditions differ from plans. • Does not easily accommodate performance or outcome-based specifications.
Progressive Design-Build (PCC § 22185)	• Qualifications-based selection ensures experienced team. • Collaborative “open-book” design and pricing. • Flexibility to refine scope before final GMP.	• Requires significant owner participation in Phase 1. • Longer upfront planning period and potential associated “time” cost. • PCC procedures and reporting requirements.
Public-Private Partnership (P3)	• Transfers design, financing, and operational risk. • Private capital supports large projects e.g. substation. • Supports performance-based contracts tied to reliable service level agreement operation	• Complex and time-consuming to negotiate. • Legal and financial structuring costs higher. • May require enabling resolutions and long-term commitments

Contract Types

Contract Type	Description	Advantages	Considerations / Risks
Power Purchase Agreement (PPA)	Developer owns and operates system; District purchases electricity per kWh rate over a fixed term (e.g., 20–25 years).	• No upfront capital. • Predictable future energy cost. • Developer monetizes tax incentives (IRA/ITC/PTC).	• District has limited control. • Long-term obligation tied to site lease and creditworthiness. • Buyout options may be restricted. • System monitoring required.
Energy Service Agreement (ESA)	Developer provides bundled “energy service”. Payments based on performance & availability, not energy volume.	• Shifts performance and O&M risk to provider. • Flexible structure for microgrid resilience metrics. • Works with GC 4217 or P3.	• Requires robust measurement and verification (M&V). • Complex billing and reporting. • May carry higher service premiums.
Shared Savings Agreement (SSA)	Payments are based on sharing verified actual cost savings relative to established baseline utility bills.	• Both parties share incentives. • Pay-for-performance structure minimizes downside. • Encourages optimization & system efficiency.	• Requires detailed baseline analysis and M&V plan. • Savings fluctuates per rate changes. • Limited scalability for larger projects.
Engineering, Procurement, and Construction (EPC)	District funds project; EPC contractor delivers design, procurement, construction, and commissioning per fixed-price or guaranteed basis.	• District owns and controls assets and benefits • Flexible financing (COPs, grants, incentives). • District provides O&M	• District bears financing and operational risk. • Requires internal technical oversight. • Upfront capital investment required.

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We solve energy infrastructure puzzles.

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