Clean Coalition

CAISO: New leadership and the path forward

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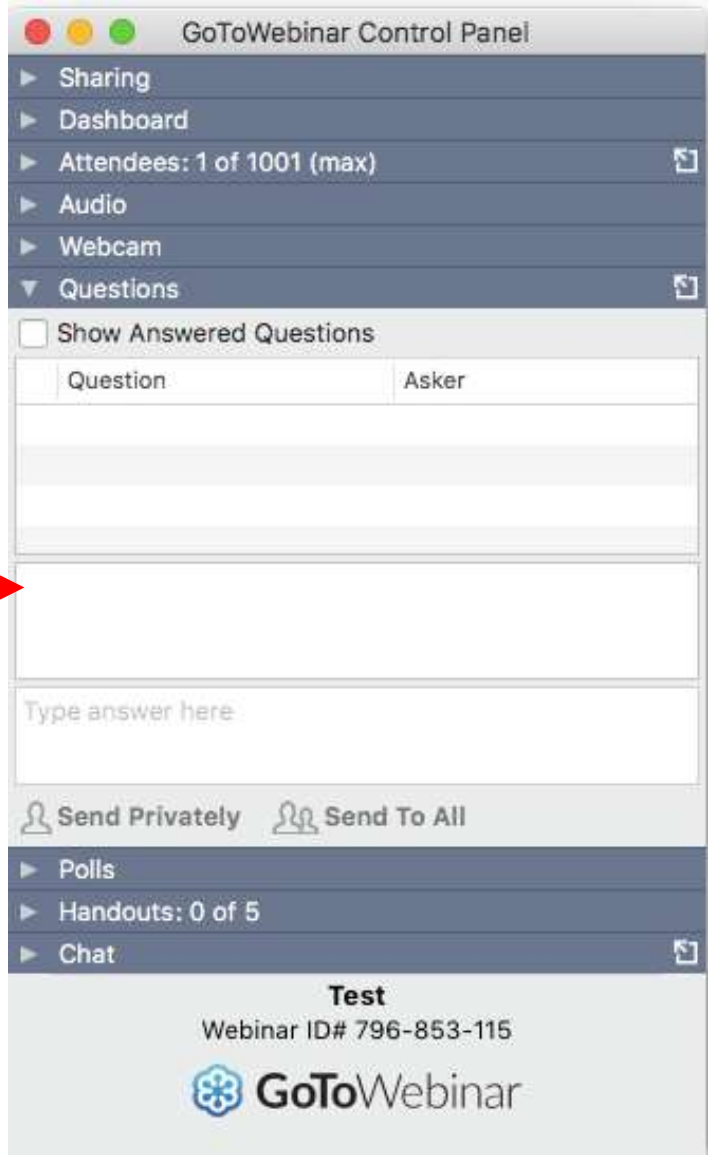


Presenters

Elliot Mainzer, CAISO President and CEO

Elliot Mainzer is committed to using leading-edge policies and new technologies to accelerate California's drive toward the reliable decarbonization of its electric power grid. He started in his new role at the ISO on September 30, 2020 following a successful 18-year career at the Bonneville Power Administration (BPA) where he was at the forefront of transformational changes in the western electricity market. He has co-chaired the Western Electric Industry Leaders Group and has served as the Chair of the U.S. Entity for the Columbia River Treaty with Canada and on the boards of the Electric Power Research Institute, and the Utility Wind Integration Group.

A native of San Francisco, Mr. Mainzer has an undergraduate degree in geography from U.C. Berkeley and a master's degrees in Business Administration and Environmental Studies from Yale University

Presenters

Mark Rothleder
CAISO Chief Operating Officer

Neil Millar
VP of Infrastructure and Operations Planning

Stacey Crowley
VP of External and Customer Affairs

Anna McKenna
Interim Head of Market Policy and Performance

Delphine Hou
Director of California Regulatory Affairs

Presenters

Craig Lewis

Craig is Executive Director of the Clean Coalition. He has over 30 years of experience in the renewables, wireless, semiconductor, and banking industries. Previously VP of Government Relations at GreenVolts, he was the first to successfully navigate a solar project through California's Renewable Portfolio Standard solicitation process. Craig was energy policy lead on Steve Westly's 2006 California gubernatorial campaign. His resume includes senior government relations, corporate development, and marketing positions at leading wireless, semiconductor, and banking companies such as Qualcomm, Ericsson, and Barclays Bank. Craig received an MBA and MSEE from the University of Southern California and a BSEE from the University of California, Berkeley.

Mission

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

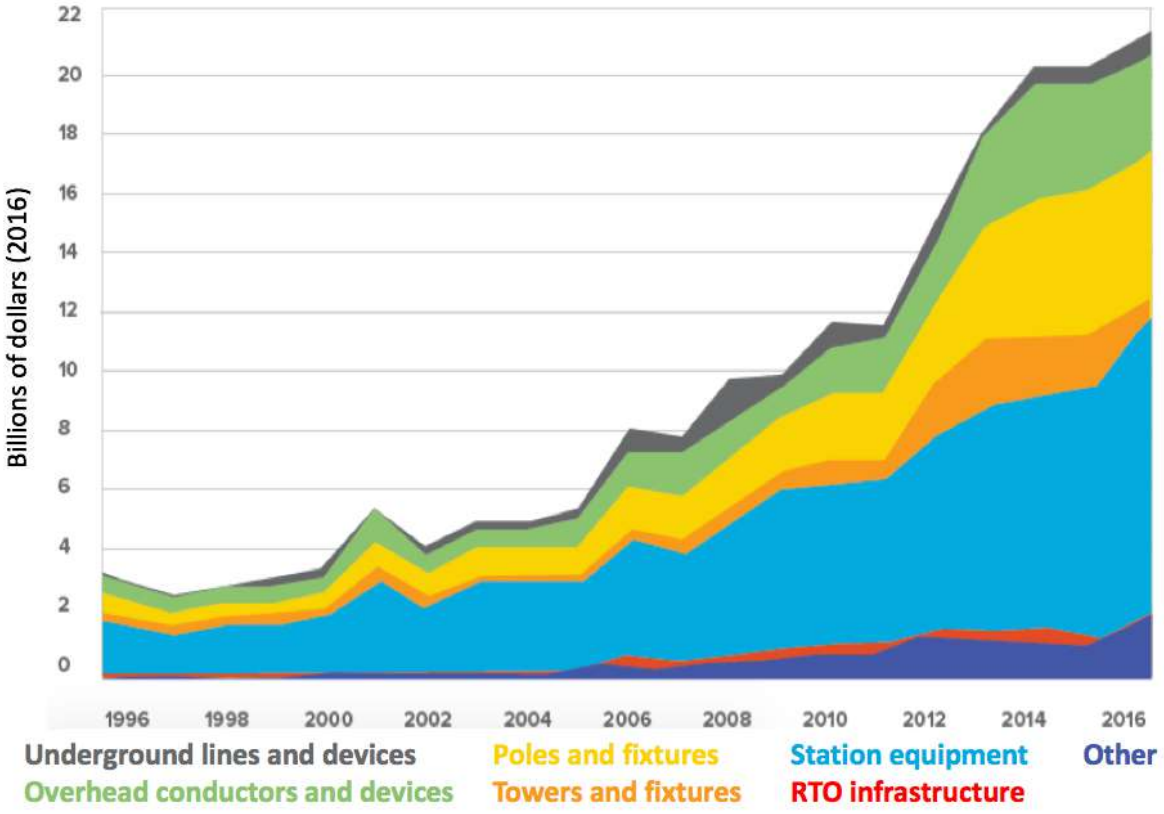
100% renewable energy end-game

- 25% local, interconnected within the distribution grid and facilitating resilience without dependence on the transmission grid.
- 75% remote, dependent on the transmission grid for serving loads.

Transmission costs are fastest growing component of electricity costs

- Unbelievably high guaranteed 12% return-on-equity for transmission investments leads to predictable conflicts-of-interest and perverse market outcomes.
- Market distortions like the erroneous metering & assessment of Transmission Access Charges (TAC) for California IOUs creates massive market distortions that steal value from local generation, hurt ratepayers, and preempt energy resilience.

The explosion in transmission spending by major utilities, 1996 - 2016



Transmission costs are bigger than they seem due to O&M driving ~10x increase to upfront costs

- Transmission costs are the fastest-growing component of electricity bill and are already about the same cost as the energy itself.
- The capital costs of transmission infrastructure represent a fraction of total transmission costs. Operations and maintenance (O&M) and returns on investments drive up transmission costs significantly over the life of these assets, with those excessive costs borne by ratepayers.

Nominal costs

Asset value capital cost ($100 base)	$100
Return	$197
O&M	$631
Total nominal ratepayer cost per $100 investment (50 years)	**$928**

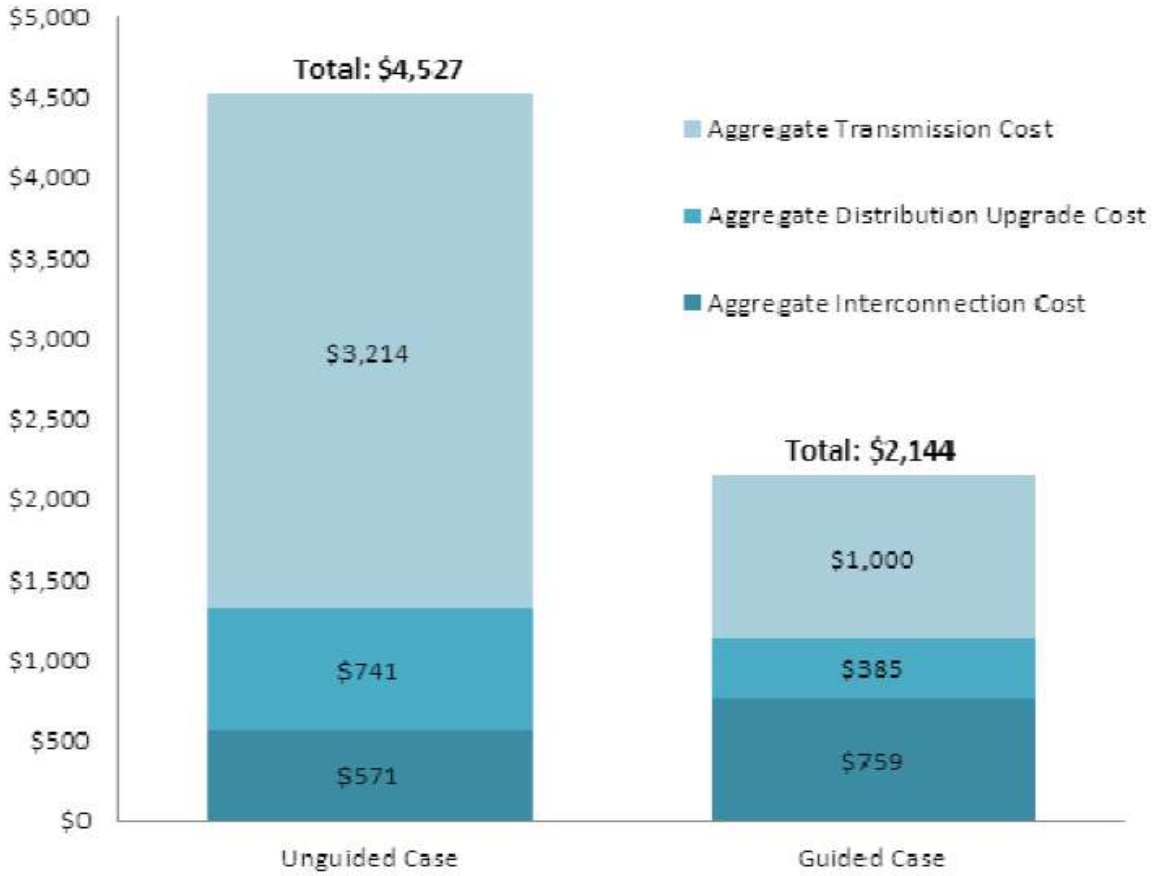
Real costs, discounted for inflation

Discount rate	2.19%
Asset value capital cost ($100 base)	$100
Return, discounted	$140
O&M, discounted	$296
Total discounted (real) ratepayer cost per $100 investment (50 years)	**$536**

In nominal dollars, total lifetime ratepayer cost is nearly 10x the initial capital cost; O&M accounts for 68% of this because it increases much faster than inflation. In real dollars (constant value dollars, accounting for inflation), the total lifetime cost is 5x the initial capital cost, and O&M accounts for 55% of this.

Optimizing the grid for ratepayer savings requires lots of local renewables & energy storage

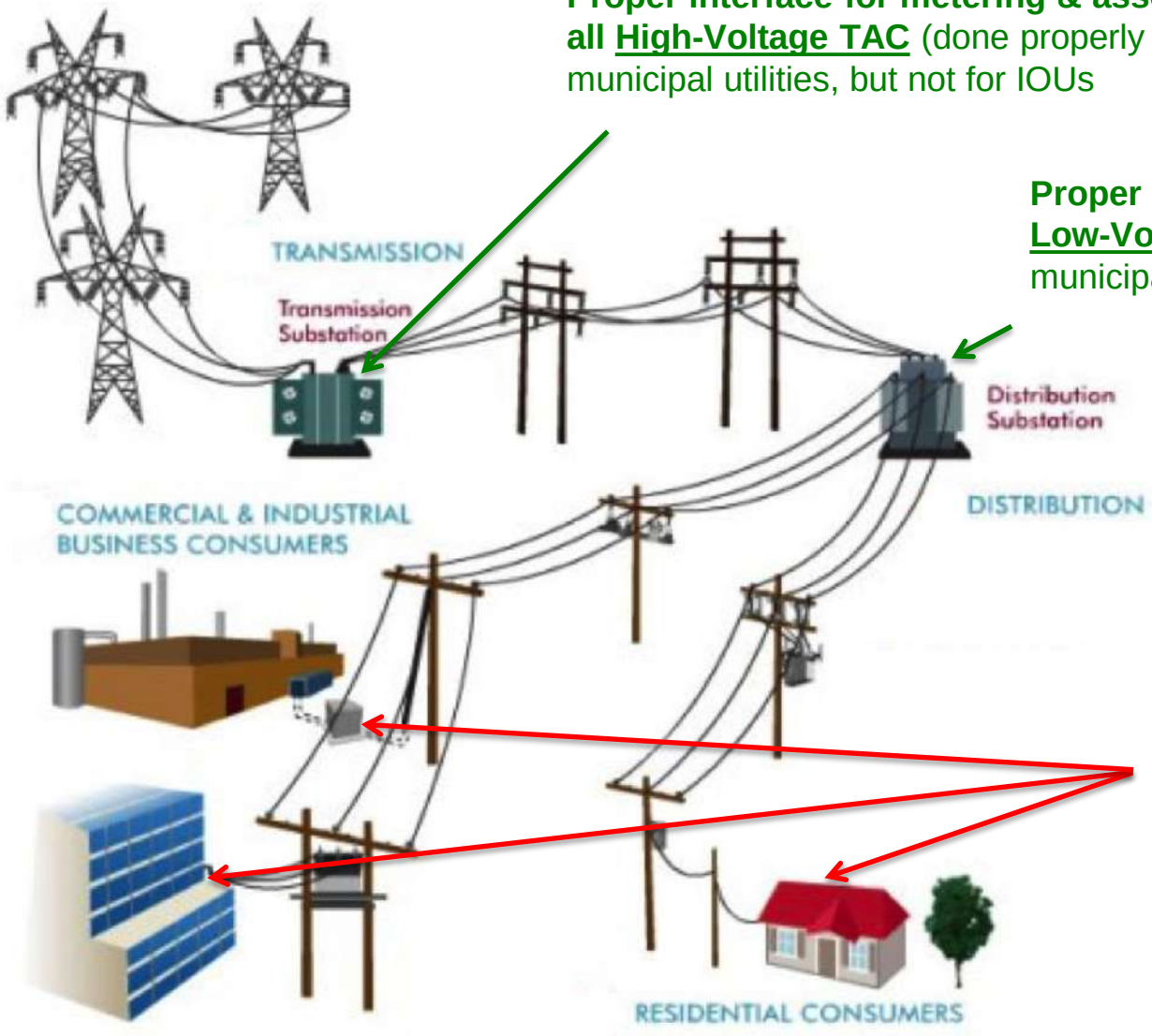
- SCE found that intelligently siting 4 GW of local solar would preempt over **$2.2 billion** in new transmission infrastructure investments, which represents approximately **$20 billion** in ratepayer savings over the lifetime of such transmission investments when considering O&M.
- Transmission costs are always borne by ratepayers, while distribution & interconnection costs are always borne by solar project developers.



TAC market distortion visual

Proper interface for metering & assessing all <u>High-Voltage TAC</u> (done properly for municipal utilities, but not for IOUs

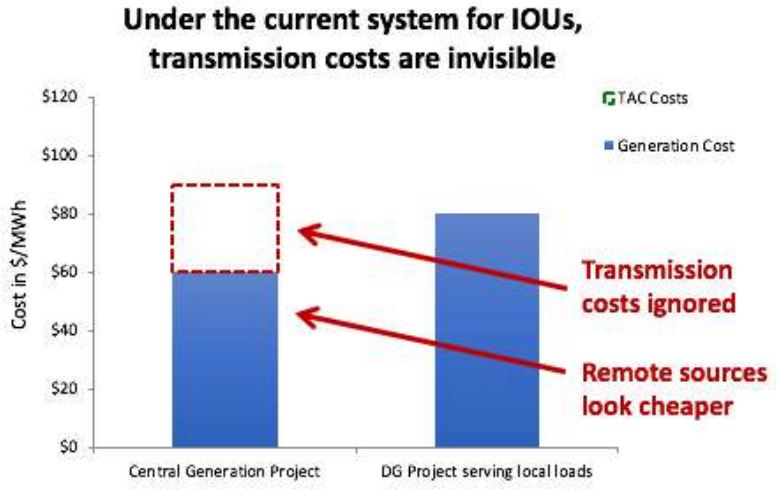
Proper interface for metering all <u>Low-Voltage TAC</u> (done properly for municipal utilities, but not for P)

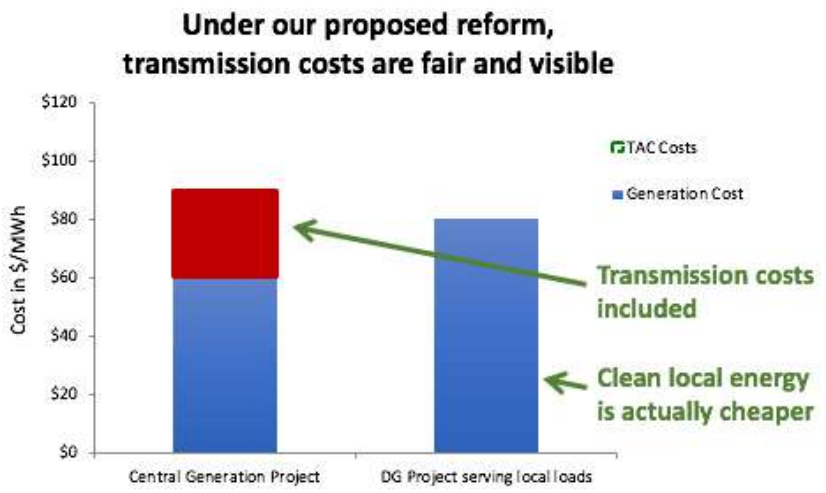


Current interface for metering TAC in IOU service territories
(at customer meters with no distinction of energy from next door vs 1,000 miles away)

TAC Campaign = easy fix to massive distortion

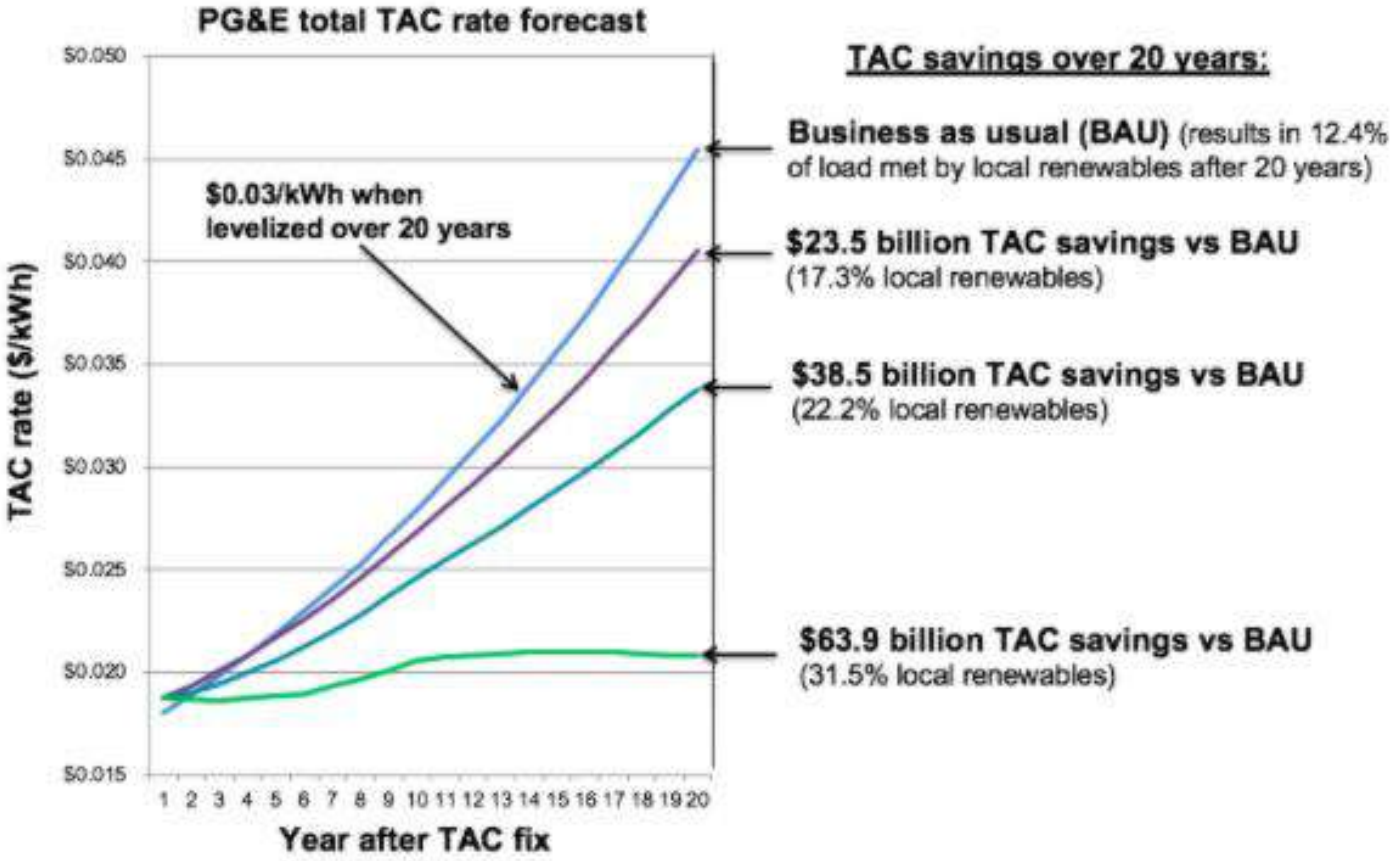
- Transmission Access Charges (TAC) in California are assessed inconsistently and unfairly, creating a massive market distortion
  - In Participating Transmission Owner (PTO) utility service territories, like IOUs, California ratepayers erroneously pay the same volumetric transmission usage fee (aka TAC) whether or not the energy they use travels across the transmission grid.
- The TAC market distortion is massive:
  - 3 cents per kWh is being stolen from local renewables, making them look more expensive at an estimated $60 billion cost to California ratepayers over 20 years.
  - Stealing funds from DER-driven Community Microgrids that deliver community resilience.
- The easy fix is to consistently meter and assess TAC based on actual volumetric use of the transmission grid as is already the case for non-PTO utilities.





Not fixing TAC would cost Californians $60 billion over the next two decades

- Generating energy closer to where we use it means we need less transmission infrastructure, which lowers costs for ratepayers by avoiding expensive transmission lines.
- Continuing with business as usual will cost Californians ~ $60 billion in avoidable transmission costs over the next 20 years.



Optimizing the grid for energy resilience requires lots of local renewables & energy storage

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Goleta Load Pocket (GLP) is the perfect opportunity for a Community Microgrid

- GLP spans 70 miles of California coastline, from Point Conception to Lake Casitas, encompassing the cities of Goleta, Santa Barbara (including Montecito), and Carpinteria.
- GLP is highly transmission-vulnerable and disaster-prone (fire, landslide, earthquake).
- **200 megawatts (MW) of solar and 400 megawatt-hours (MWh) of energy storage** will provide 100% protection to GLP against a complete transmission outage ("N-2 event").
  - 200 MW of solar is equivalent to about 5 times the amount of solar currently deployed in the GLP and represents about 25% of the energy mix.
  - Multi-GWs of solar siting opportunity exists on commercial-scale built environments like parking lots, parking structures, and rooftops; and 200 MW represents about 7% of the technical siting potential.
  - Other resources like energy efficiency, demand response, and offshore wind can significantly reduce solar+storage requirements.

Full value of local renewables must be compensated

Direct Relief case study: Can do five times more local solar (and lots more energy storage too), but there are no market mechanisms available for commercial-scale DER. What is clear, though, is that the TAC market distortion steals 3 cents/kWh from Feed-In Tariff (FIT) programs and Net Energy Metering (NEM) export — and this massive market distortion needs to be fixed.

Direct Relief Solar Microgrid could be 5 times bigger and serve the broader GLP Community Microgrid