Clean Coalition

Making Clean Local Energy Accessible Now

Transmission Access Charges (TAC)

A massive market distortion that harms local renewables and California ratepayers

Katie Ramsey
Staff Attorney
Clean Coalition
202-709-8063 mobile
katie@clean-coalition.org

Daryl Michalik
Associate Executive Director
Dynamic Grid Council
415-305-0202 mobile
daryl@dynamicgridcouncil.com

Key TAC-related definitions

- Transmission Access Charges (TAC)
  - Per kWh fees for using the CAISO-controlled transmission grid.
  - There are Low Voltage (LV) and High Voltage TAC.
- Transmission Energy Downflow (TED)
  - Energy that downflows across defined transmission interfaces points
    - Two existing points: HV-to-LV and LV-to-Distribution.
    - Under CAISO expansion there would be a third point: Super HV-to-HV.
  - Correct metering basis for assessing TAC.
- Customer Energy Downflow (CED)
  - Energy that downflows from the distribution grid across customer meters.
  - Incorrect metering basis for assessing TAC.
- Participating Transmission Owner (PTO)
  - Entity that owns part of the CAISO-controlled transmission grid.
  - TAC correction is needed in PTO utility service territories (IOUs).
  - Non-PTO utilities (munis) are already handled correctly for TAC.

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3. Why resolve the TAC before CAISO expansion?
4. CAISO's delays to date
5. Next steps & how to get involved

Distributed Generation (DG) = Wholesale DG and Retail DG export (often referred to as NEM export)

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Project Size

50+ MW

500 kW

5 kW

Wholesale DG
Serves Local Loads

Retail DG
Serves Onsite Loads

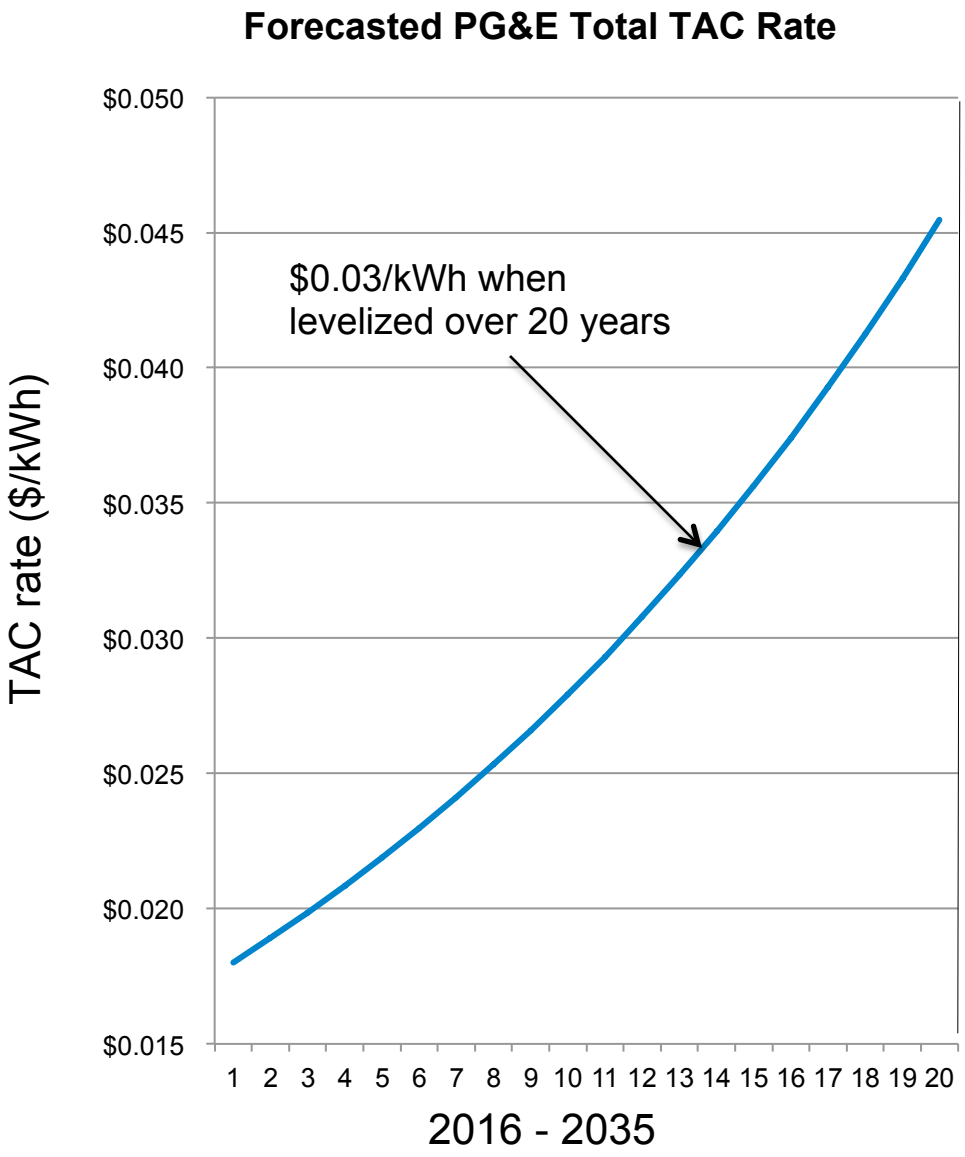
Central Generation
Serves Remote Loads

Behind the Meter

Distribution Grid

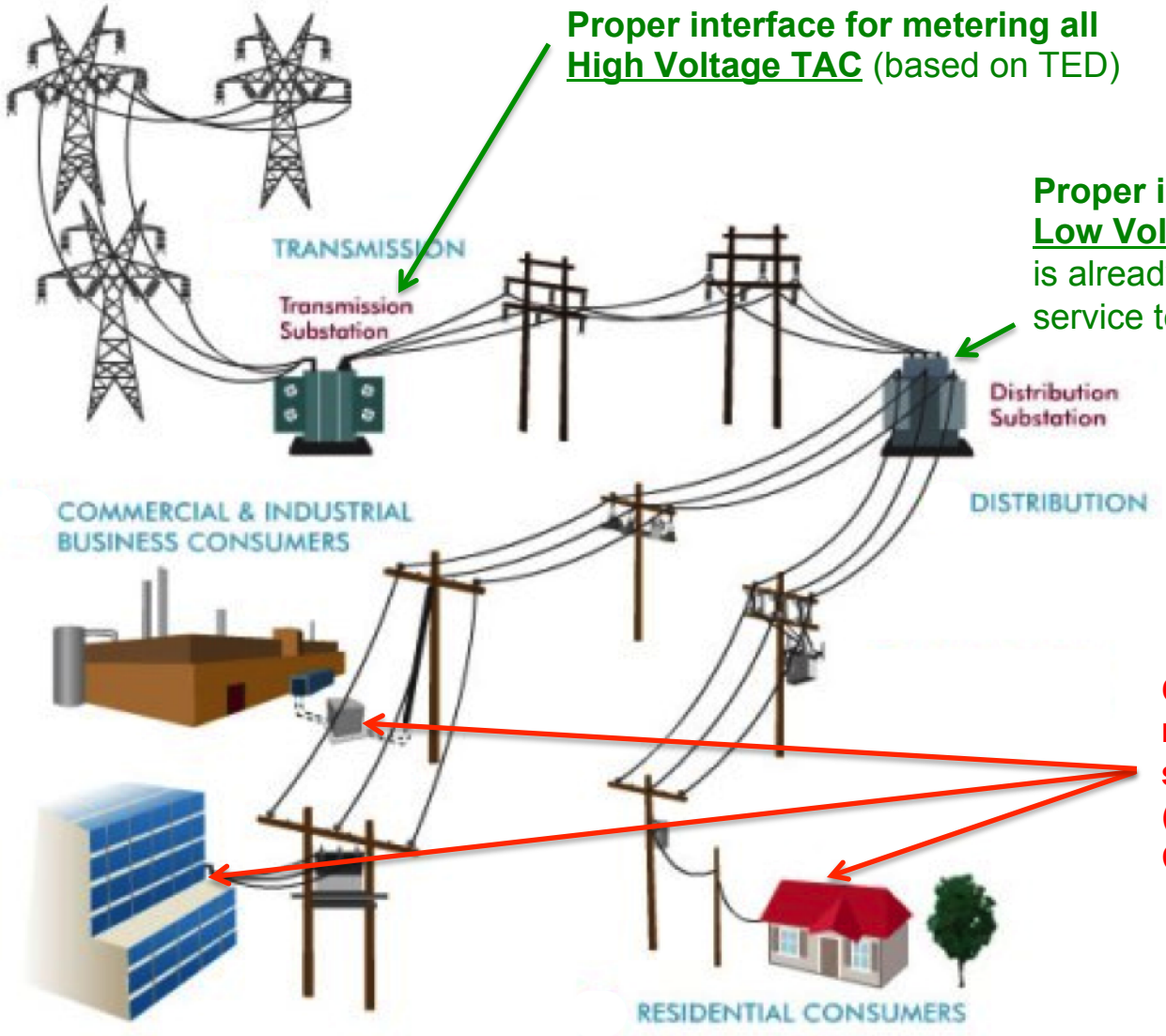
Transmission Grid

Ratepayers benefit through avoided transmission costs



The 20-year levelized TAC is about 3 cents/kWh, which is roughly 50% of the current wholesale cost of new energy contracts in California!

TAC metering fix is needed



Proper interface for metering all <u>High Voltage TAC</u> (based on TED)

Proper interface for metering all <u>Low Voltage TAC</u> (based on TED as is already done in non-PTO utility service territories)

Current interface for metering TAC in PTO utility service territories
(at customer meters based on Customer Energy Downflow)

CAISO expansion poses high risks for California

- CAISO is pushing to expand its balancing authority area and is expected to introduce relevant legislation in January 2017
- CAISO's expansion will likely include large investments in Super-High Voltage (SHV) transmission that connects sub-regions
- Key issues: creating a new governance structure with reduced California governmental control, allocating transmission costs between sub-regions

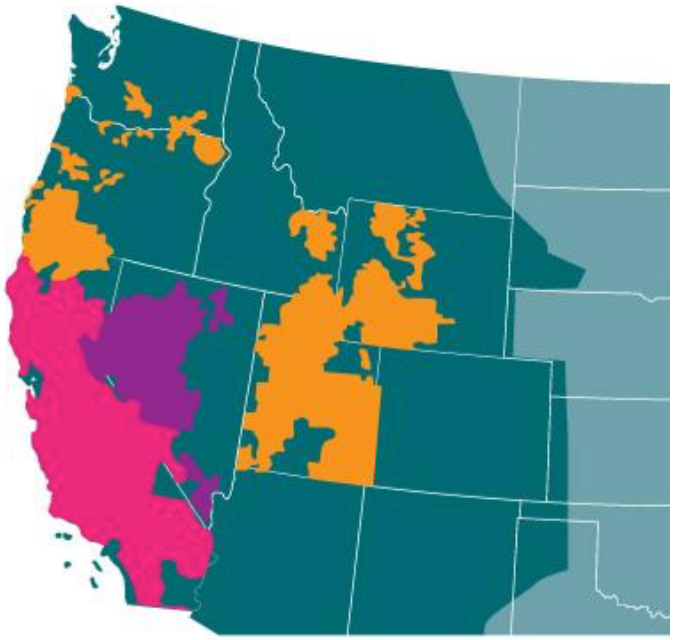
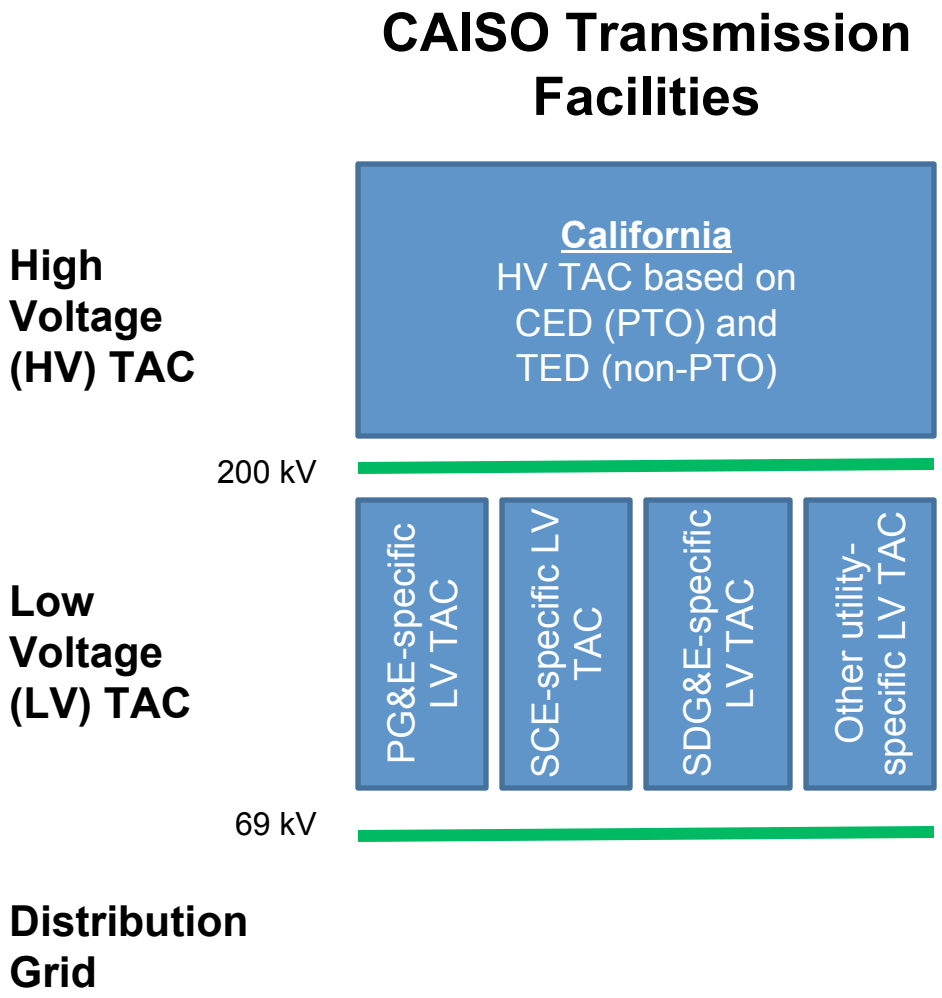
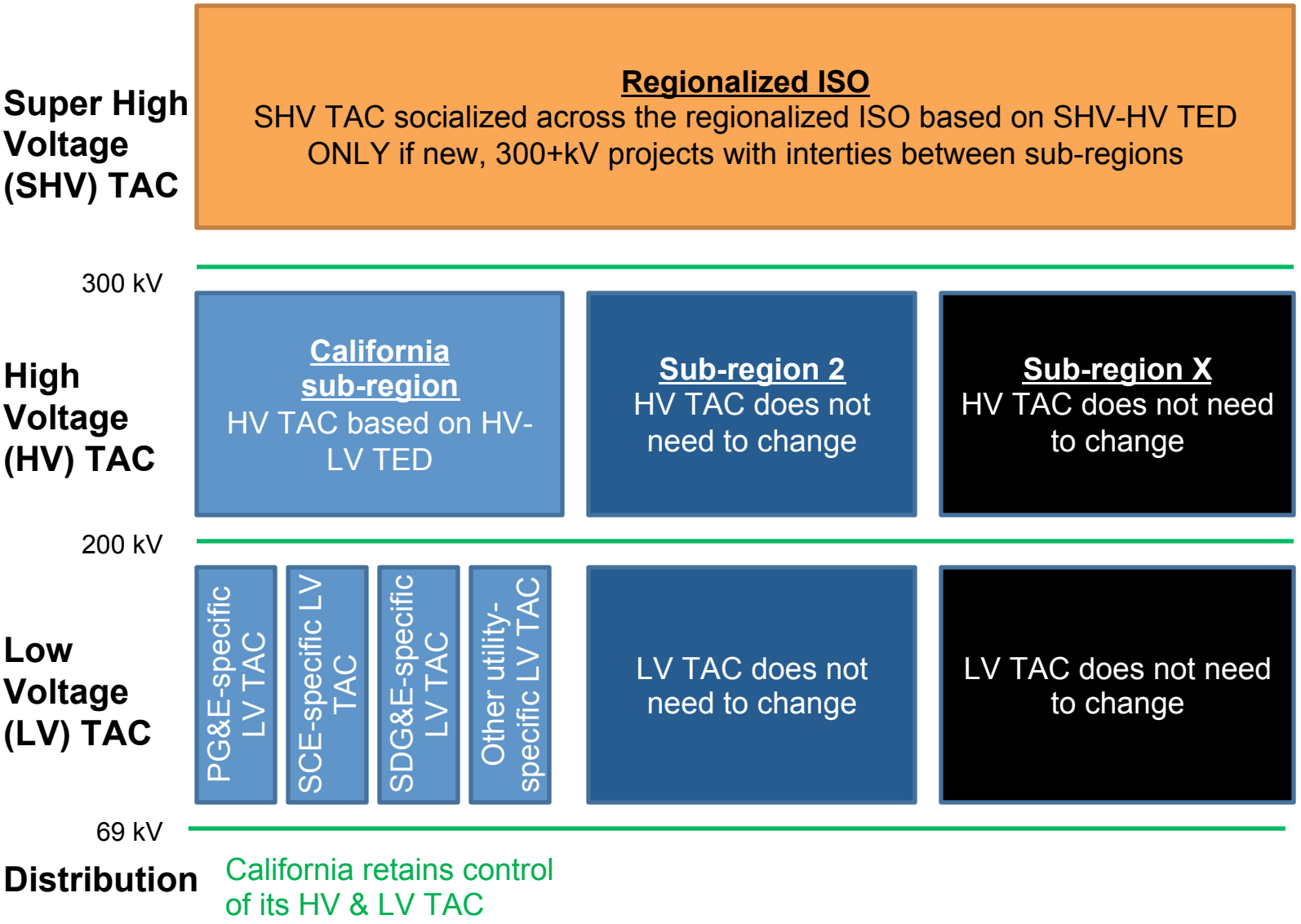


Image source: CAISO

CAISO's Current Transmission Market Structure

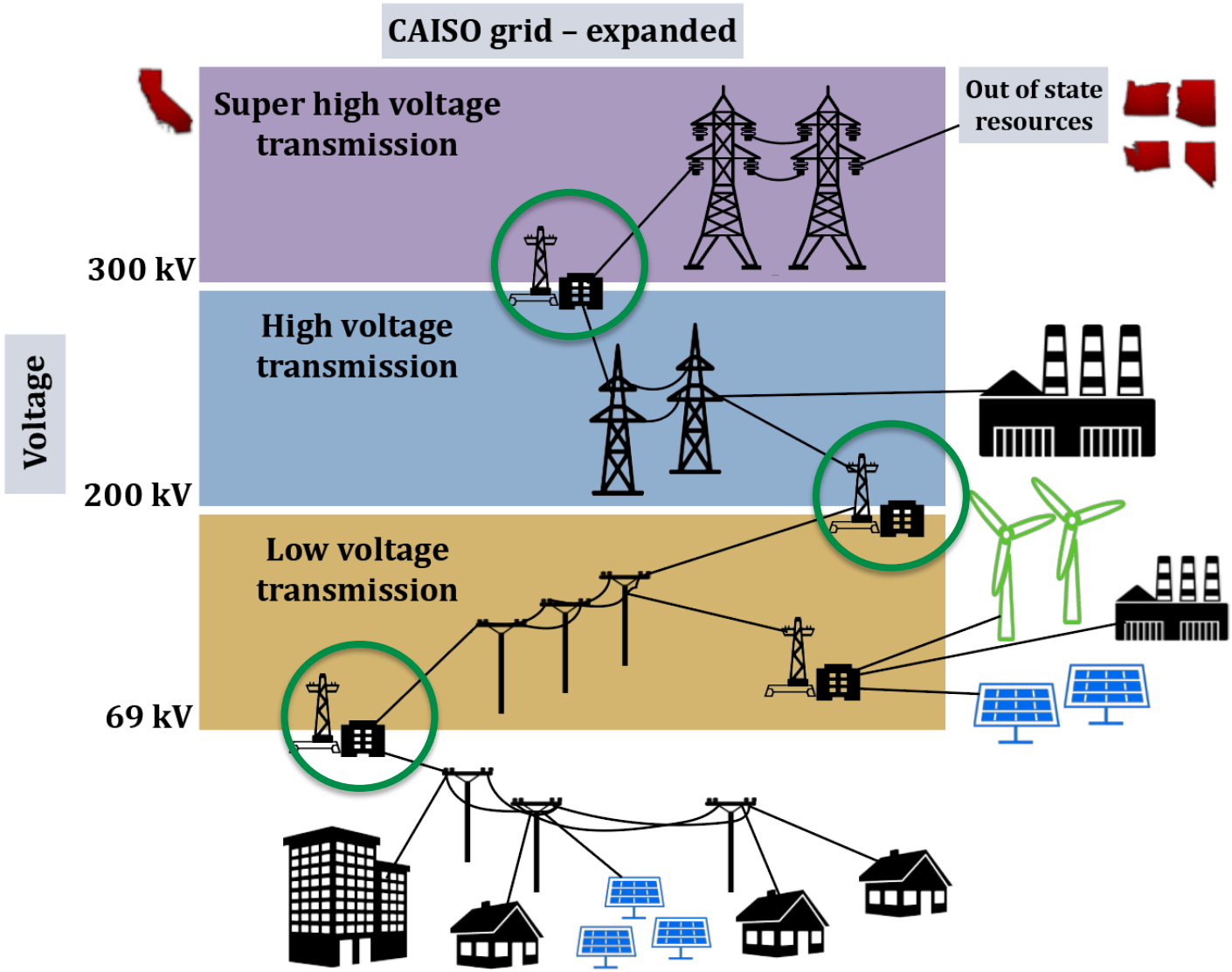


Clean Coalition's TED-based SHV allocation reduces risk for California



The SHV-HV firewall protects each sub-region from HV & LV transmission investments that serve other sub-regions. Similarly, the HV-LV firewall currently protects each utility service territory in CAISO from LV transmission investments that serve other utility service territories.

TED-based TAC: simple & objective



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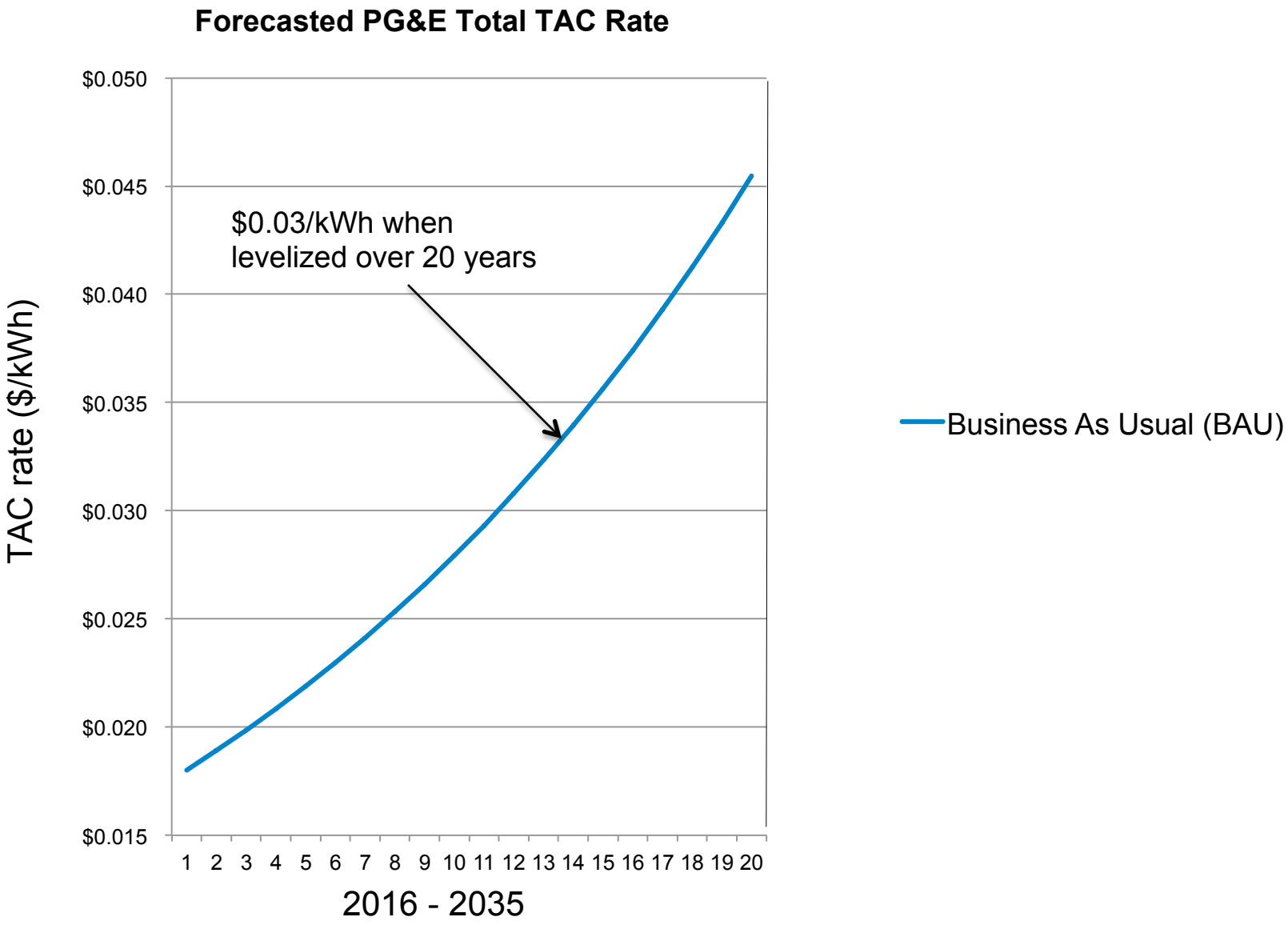
Ratepayers benefit through avoided transmission costs



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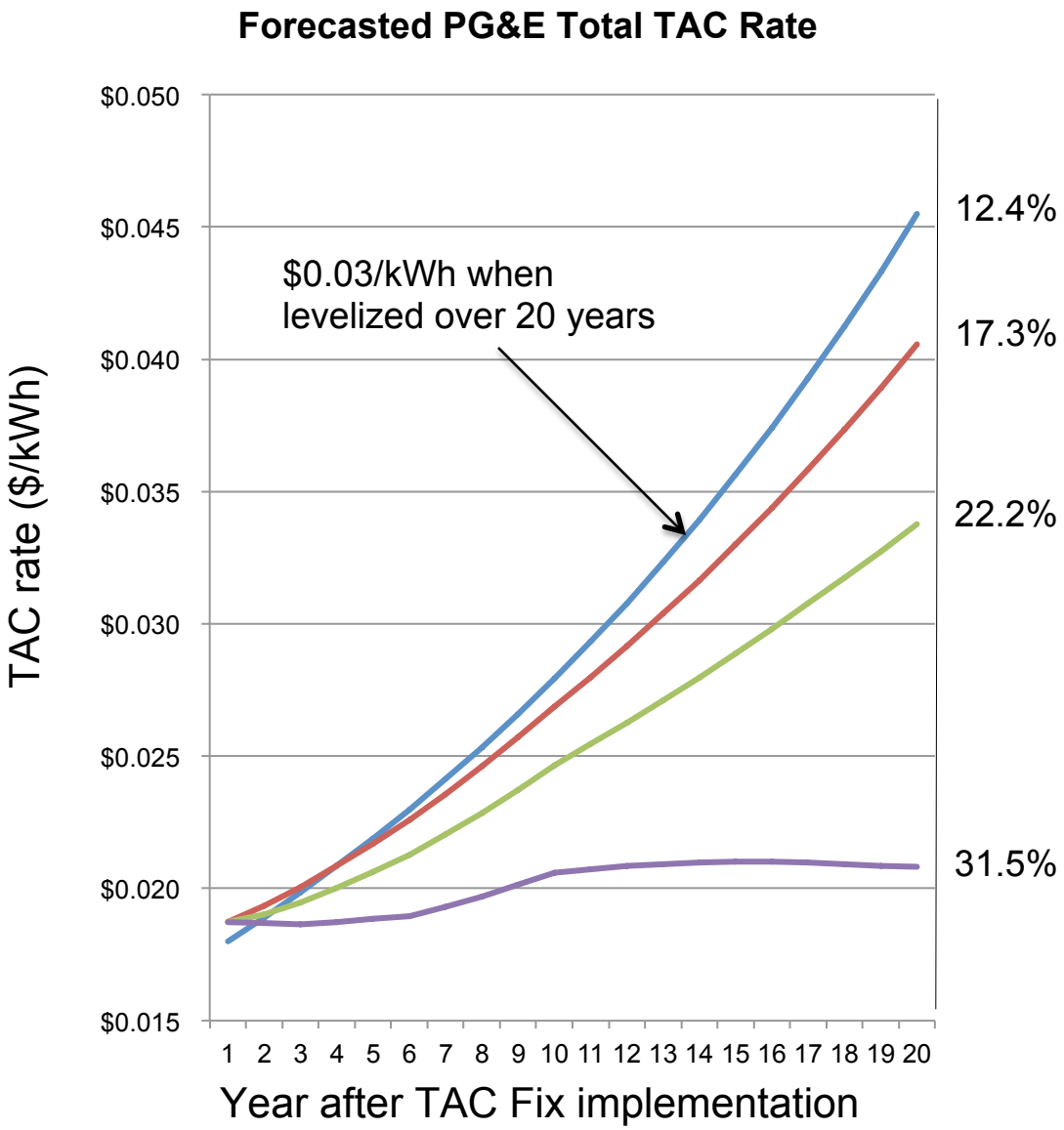
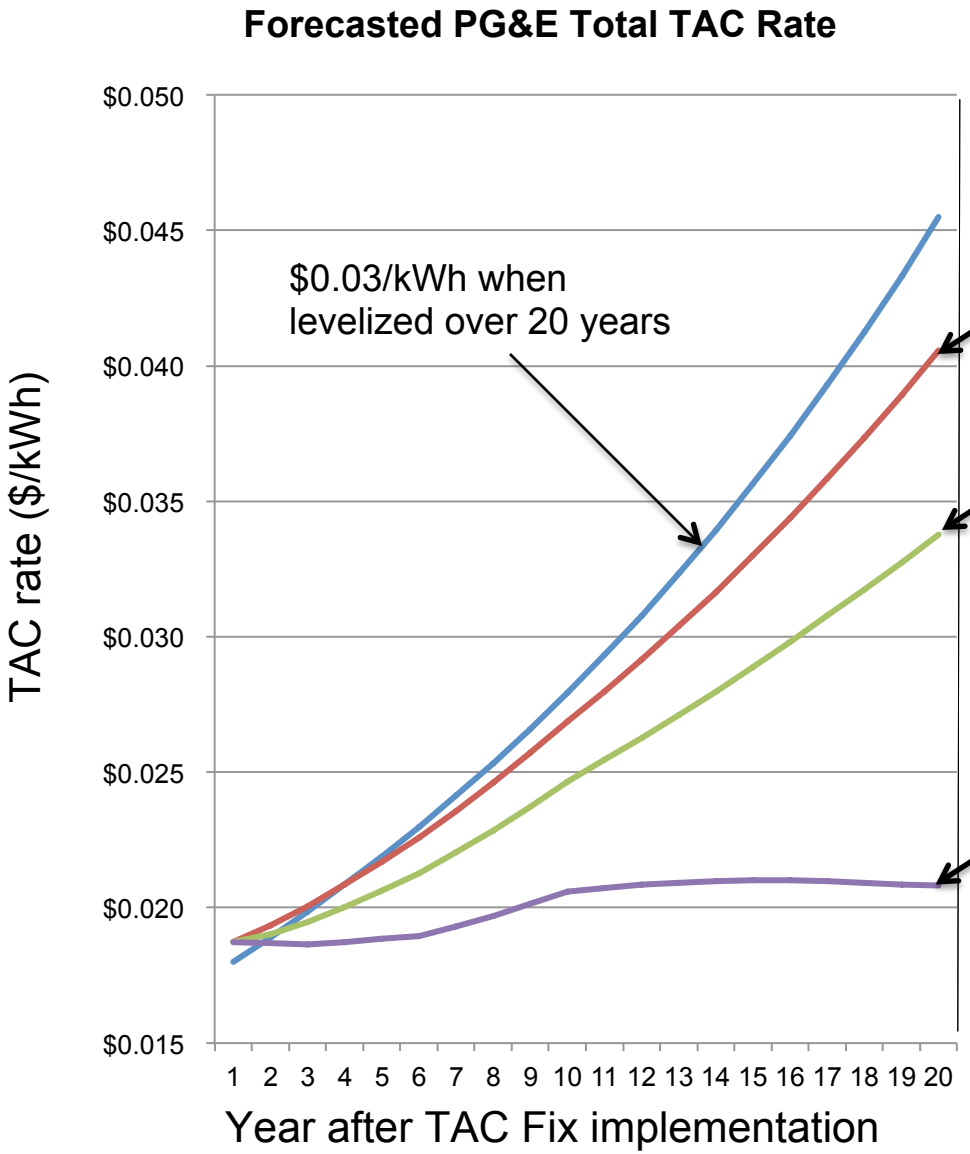


Notes & Assumptions

- All 3 scenarios assume generation from new DG never exceeds new load

- Business As Usual (BAU)
- Post-TAC fix Scenario 1: Total DG added per year 1.5x of BAU
- Post-TAC fix Scenario 2: Total DG added per year 2x of BAU
- Post-TAC fix Scenario 3: Total DG added per year 3x of BAU

Ratepayers benefit through avoided transmission costs



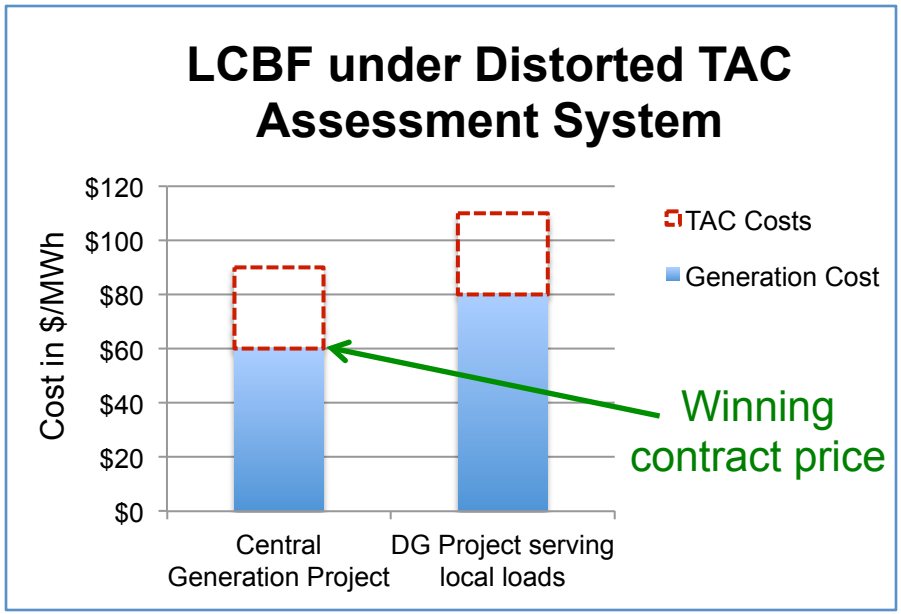
$23.5 billion TAC savings vs. BAU

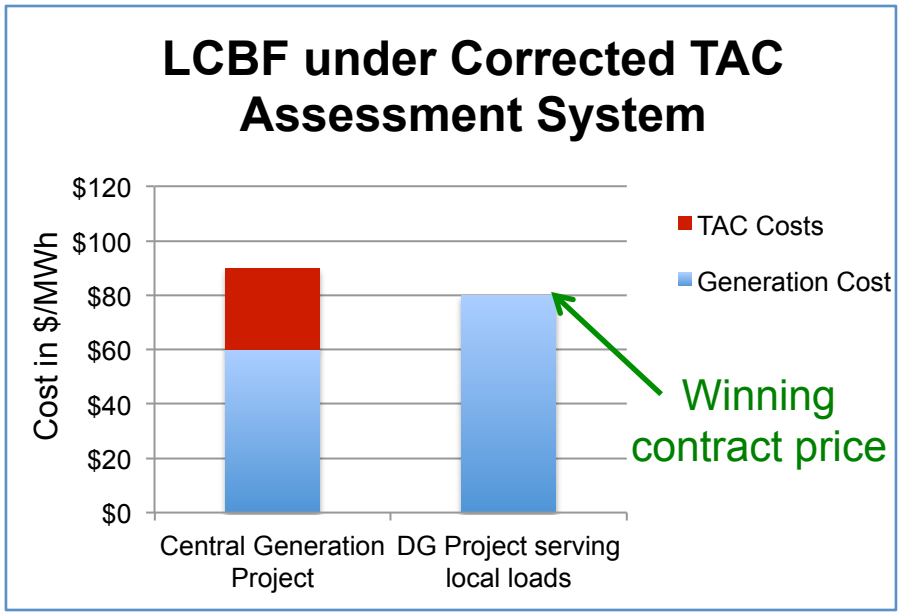
$38.5 billion TAC savings vs. BAU

$63.9 billion TAC savings vs. BAU

Ratepayer avoided TAC costs over 20-year period in the 1.5x, 2x, and 3x BAU DG scenarios

DG Developers benefit from full valuation of DG resources





- Current TAC assessment unfairly increases the cost of local distributed generation (DG) even though it almost never uses the transmission system
- Fixing the TAC market distortion makes local generation more competitive
- Over time, more local generation will be built, decreasing the need for transmission upgrades, and decreasing overall system costs

Cost effect example: immediate

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2016 Scenario	IOU	CCA	ESP	Total	Notes
LSE Customer Energy Downflow (CED, in GWh)	70	30	10	110	*Current TAC wholesale billing determinant*
% of Total CED	64%	27%	9%	100%	*Share of total TAC basis (now)*
TRR (in thousands)	NA	NA	NA	$1,650	*Total Transmission Revenue Required*
TAC Rate per kWh (now)	$0.0150	$0.0150	$0.0150	$0.0150	*TRR/CED*
TAC payment (in thousands)	$1,050	$450	$150	$1,650	*TAC Rate x CED*
DG (GWh)	2.8	1.2	0	4	*4% is the highest current % of DG in any PTO utility service territory*
Share of LSE CED served by DG	4%	4%	0%	4%	
TED (GWh)	67.2	28.8	10	106	*Proposed TAC basis*
% of TED	63.4%	27.2%	9.4%	100%	*Share of total TAC basis (proposed)*
TRR (in thousands)	NA	NA	NA	$1,650	*Remains unchanged*
TED-based TAC Rate (per kWh)	$0.0157	$0.0157	$0.0157	$0.0157	*TRR/TED*
TED-based TAC payments (in thousands)	**$1,046 (-$4)**	**$448 (-$2)**	**$156 (+$6)**	**$1,650**	*New TAC Rate x TED*

Cost effect example: long term (2 x BAU DG Scenario)

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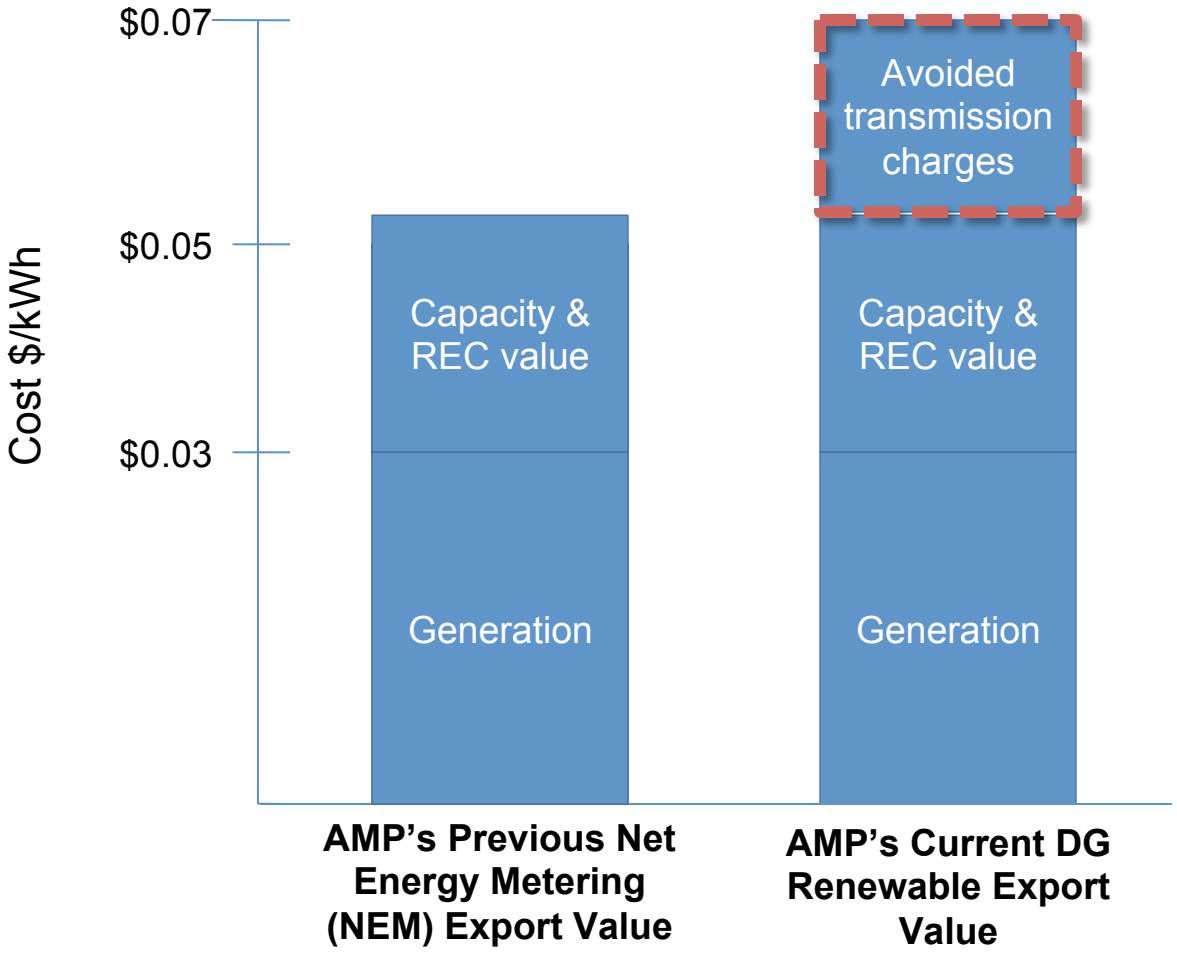
2035 Scenario	IOU	CCA	ESP	Total	Notes
LSE Customer Energy Downflow (CED; in GWh)	70	30	10	110	Current CED and TAC basis
% of Total CED	64%	27%	9%	100%	Share of total TAC basis (now)
TRR (projected 2035, in thousands)	NA	NA	NA	$5,740	Total Transmission Revenue Requirement
TAC Rate per kWh (projected 2035)	$0.052	$0.052	$0.052	$0.052	TRR/CED
TAC payment (in thousands)	$3,653	$1,565	$522	$5,740	TAC Rate x CED
DG (GWh)	8.00	12.00	0.00	20.00	18% energy sourced below T-D interface
Share of total LSE CED served by DG	11%	40%	0%	18%	*Increased to 2 x BAU case*
TED (GWh)	62.00	18.00	10.00	90.00	Proposed TAC basis
% of TED	68.9%	20.0%	11.1%	100.0%	Share of total TAC basis (proposed)
TRR (in thousands)	NA	NA	NA	$4,470	Reduced (due to deferred need for new capacity)
TED-based TAC Rate per kWh (projected 2035)	$0.0497	$0.0497	$0.0497	$0.0497	TRR/TED; TRR is reduced to DG meeting share of load growth
TED-based TAC payments (in thousands) Savings	**$3,079 (-$573)**	**$894 (-$671)**	**$497 (-$25)**	**$4,470**	New TAC Rate x TED (and change from business-as-usual)

NEM customers benefit from higher values for exports

Alameda Municipal Power (AMP) released their plan to credit their customers with DG resources for avoided transmission charges, meaning participating customers will see higher payouts for their exported energy.



LSEs with significant DG resources benefit from more competitive pricing

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Marin Clean Energy (MCE) 2016 service offerings

PG&E (Opt Out)	MCE Light Green	MCE Deep Green	MCE Local Sol
30% renewable energy**	52% renewable energy**	100% renewable energy**	100% locally-produced solar
$47.53 PG&E Electric Delivery	$47.53 PG&E Electric Delivery	$47.53 PG&E Electric Delivery	$47.53 PG&E Electric Delivery
$44.84 Electric Generation	$33.34 Electric Generation	$37.97 Electric Generation	$65.75 Electric Generation
– Additional PG&E Fees	$11.04 Additional PG&E Fees	$11.04 Additional PG&E Fees	$11.04 Additional PG&E Fees
$92.37 avg. total cost	$91.91 avg. total cost	$96.54 avg. total cost	$124.32 avg. total cost
OPT FOR 30% RENEWABLE	ENROLL IN 52% RENEWABLE	ENROLL IN 100% RENEWABLE	ENROLL IN 100% LOCAL SOLAR

- MCE defines local as “located in an MCE member community”
- Based on a typical usage of 463 kWh at current PG&E rates and MCE rates effective September 1, 2016 under the Res-1/ E-1 rate schedule. Actual differences may vary depending on usage, rate schedule, and other factors. Estimate is an average of seasonal rates.

LSEs with significant DG resources: TAC fix saves 33% of local solar premium

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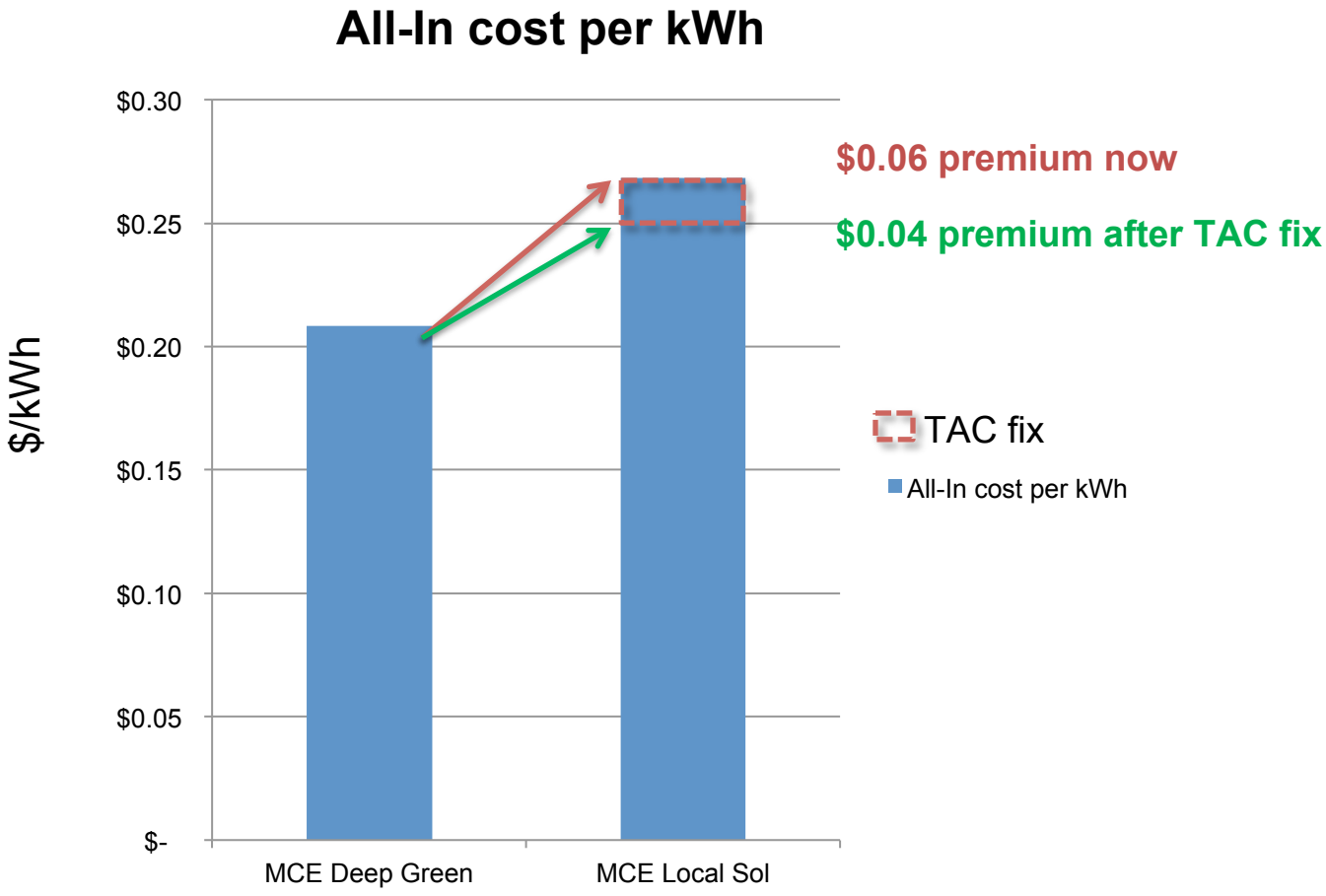
Potential Marin Clean Energy savings for 100% local solar



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Why fix TAC before regionalization?

1) **SIMPLICITY:** The Clean Coalition's SHV proposal simplifies cost allocation for regionalization. Our proposal is more straightforward than CAISO's current proposal.

2) **PRESERVES CALIFORNIA POLICY PRIORITIES:** The SHV proposal resolves the TAC question and preserves California's policy priorities and commitment to renewable energy, including DG resources.

3) **HEDGES AGAINST DILUTED GOVERNANCE:** Our proposal fixes the cost allocation mechanisms for all levels of TAC and hedges against diluted governance. In a regionalized ISO, California will not have as much control over the market signals for energy resources.

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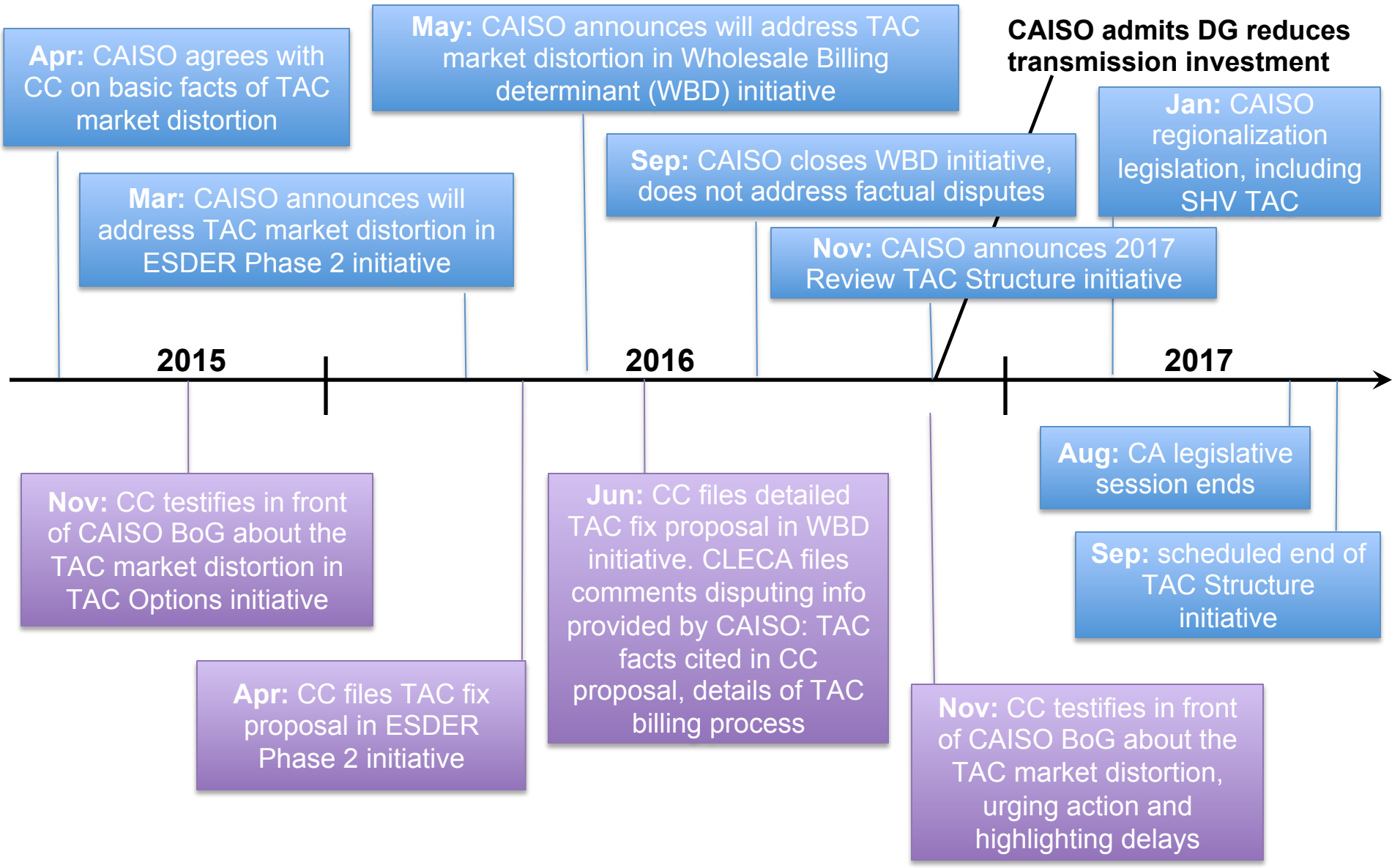
Timeline of key events shows CAISO avoiding fix



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How you can help

1. Formally support the TAC Campaign by authorizing use of your logo on the TAC Campaign Supporters web page

2. Write a letter to CAISO & Governor Brown stating you would like the TAC market distortion resolved before CAISO regionalization (template available)

3. Recruit other stakeholders to support the TAC Campaign

The TAC Fix is backed by a broad range of organizations

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Getting involved

For more information on the TAC Campaign, visit www.clean-coalition.org/tac or email katie@clean-coalition.org

Endorse the TAC Campaign

- Contact Daryl Michalik, Executive Director of the Dynamic Grid Council daryl@dynamicgridcouncil.com

Add your voice directly by filing your own comments to CAISO and key influencers

BACKUP

Why fix TAC before regionalization? Simplicity

1) **<u>The Clean Coalition's SHV proposal simplifies regionalization</u>:** our proposal solves the Super-High Voltage cost allocation challenge

- CAISO is currently reviewing methods to fairly allocate costs for new transmission facilities under the regionalized ISO, including many categories for facility types, with costs proportionate to benefits via an algorithm yet to be determined
- By contrast, the Clean Coalition's SHV proposal is
  - Simple
  - Consistent at all levels of transmission
  - Objective and transparent; no subjective benefits algorithm that could change over time
  - A solution to California's current TAC market distortion harming local renewables, by establishing the concept of measuring transmission usage at transmission interfaces, via Transmission Energy Downflow

Why fix TAC before regionalization? Preserve CA policy priorities

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2) **<u>Resolving the TAC question with the SHV solution preserves California's policy priorities</u>:** California is committed to renewable energy, including DG

- California has unique policy priorities and has taken steps to fairly reflect the value of DG resources
- The SHV solution fixes California's current TAC market distortion harming local renewables, and prevents that market distortion from spreading to other states
  - communities investing in DG resources will see a financial benefit to limiting the demand for SHV investments
  - correct market signals for SHV-transmission-dependent resources in comparison to local energy resources
- Critical CA procurement decisions are coming soon. Without the TAC fix, California will overspend on transmission assets that result in 50 years of ratepayer expenses

Why fix TAC before regionalization? Hedge against diluted governance

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3) **<u>Fixing the cost allocation mechanisms for all levels of TAC hedges against diluted governance</u>:** in a regionalized ISO, California will not have as much control over the market signals for energy resources

- Any changes in CAISO's governance structure will, by definition dilute California's management of transmission-related issues, including the market signals for cost of delivery (i.e. TAC)
- Fixing any existing market distortions on local renewables will be more difficult in the regionalized ISO, as non-Californian stakeholders will have little interest in ensuring local renewables have accurate pricing signals to fairly compete

Other ISO assess TAC based on TED

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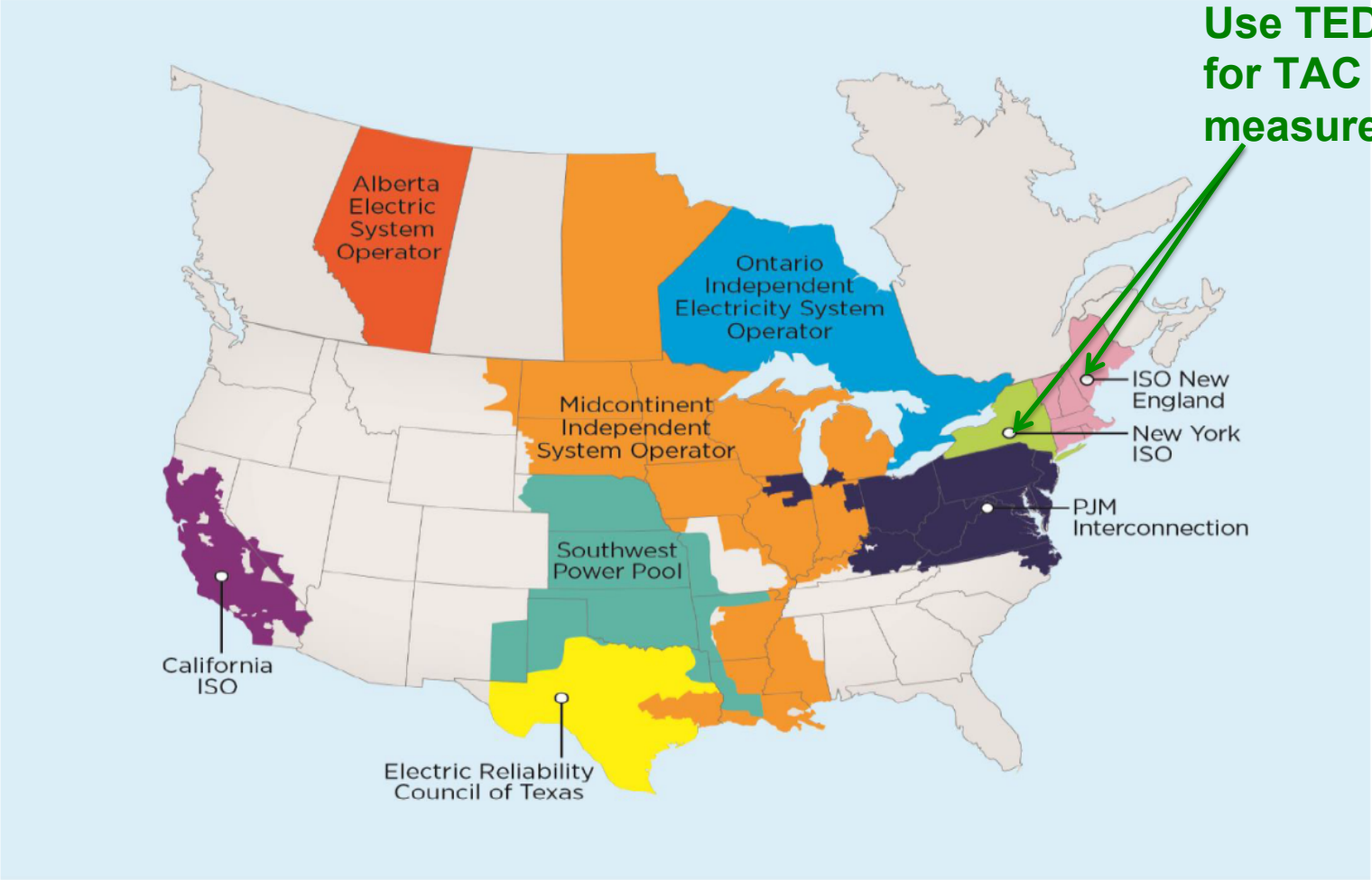
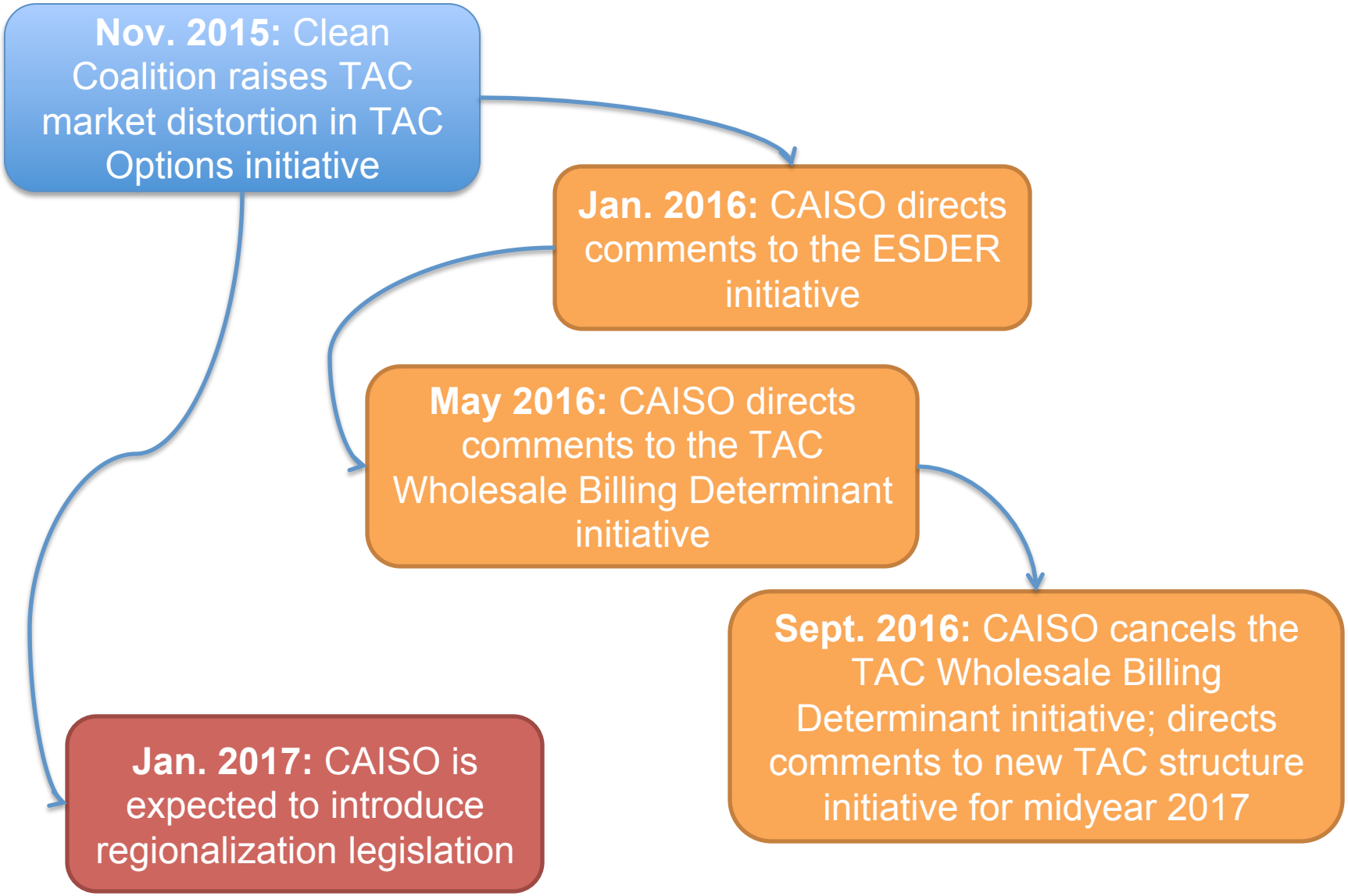
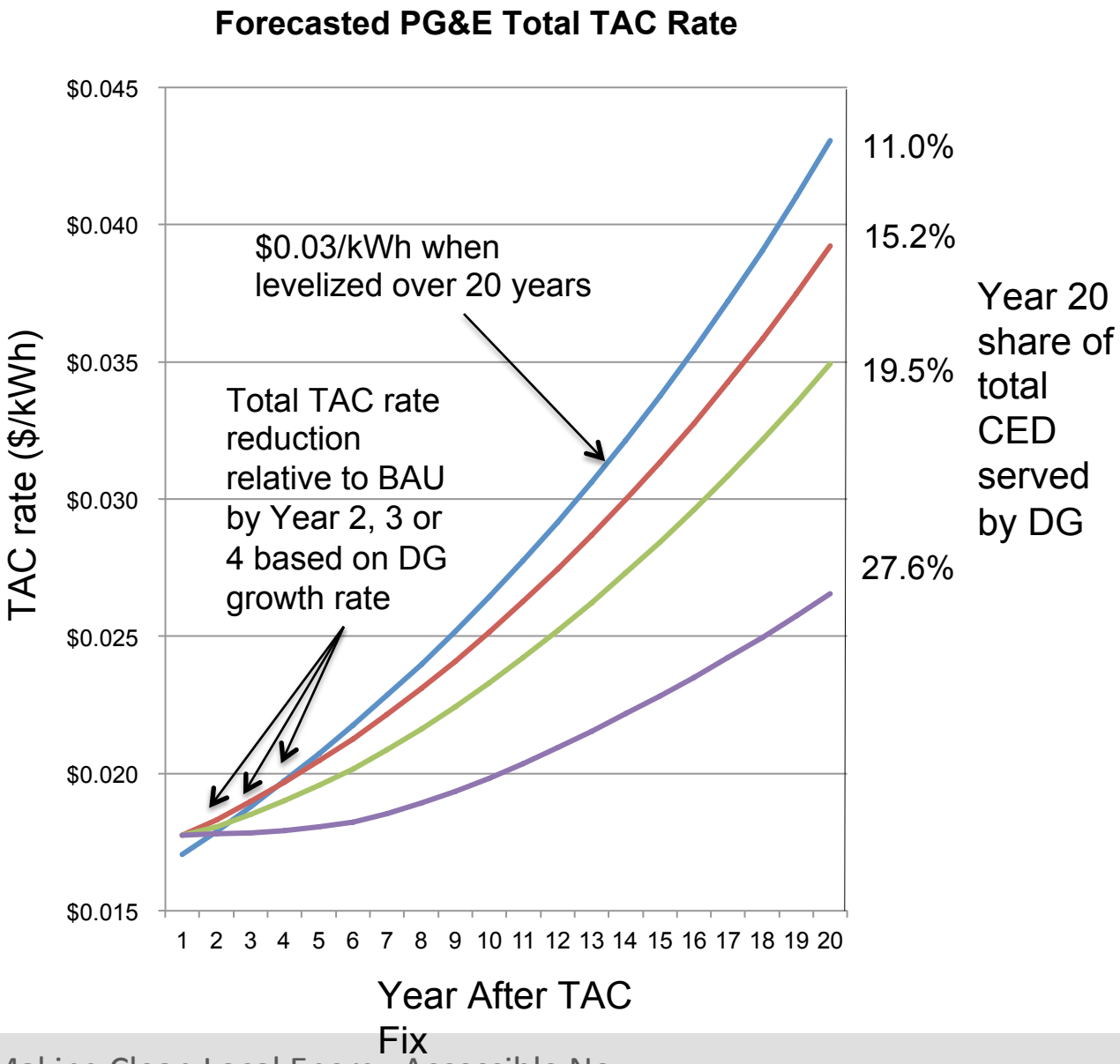
Nine Major North American RTOs / ISOs



CAISO delays to date



TAC fix unleashes local renewables



Notes & Assumptions

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- Post-TAC fix Scenario 2: Total DG added per year 2x of BAU
- Post-TAC fix Scenario 3: Total DG added per year 3x of BAU

WDG developer benefits

- Makes local generation more competitive in California's main venues for renewable energy procurement: RPS, ReMAT, DRP, IDER
  - Corrects a market distortion harming distributed generation (DG) by recognizing that distributed generation reduces the need for additional transmission investment
  - Generates ongoing local jobs in O&M after generation built
- Incentivizes keeping renewable generation in California, instead of building remote renewables in other states
- Prevents the market distortion harming DG from spreading to other states and regions within a regionalized ISO

Policymaker benefits overview

- Aligns transmission charges with actual usage, ensuring that costs follow benefits
- Corrects a market distortion harming distributed generation (DG) by recognizing that distributed generation reduces the need for additional transmission investment
- Provides an objective, straightforward, and transparent methodology for allocating new costs
- Enables one consistent TAC methodology at all levels of transmission throughout CAISO and the regionalized ISO
- Will save California ratepayers billions of dollars in avoided transmission investments