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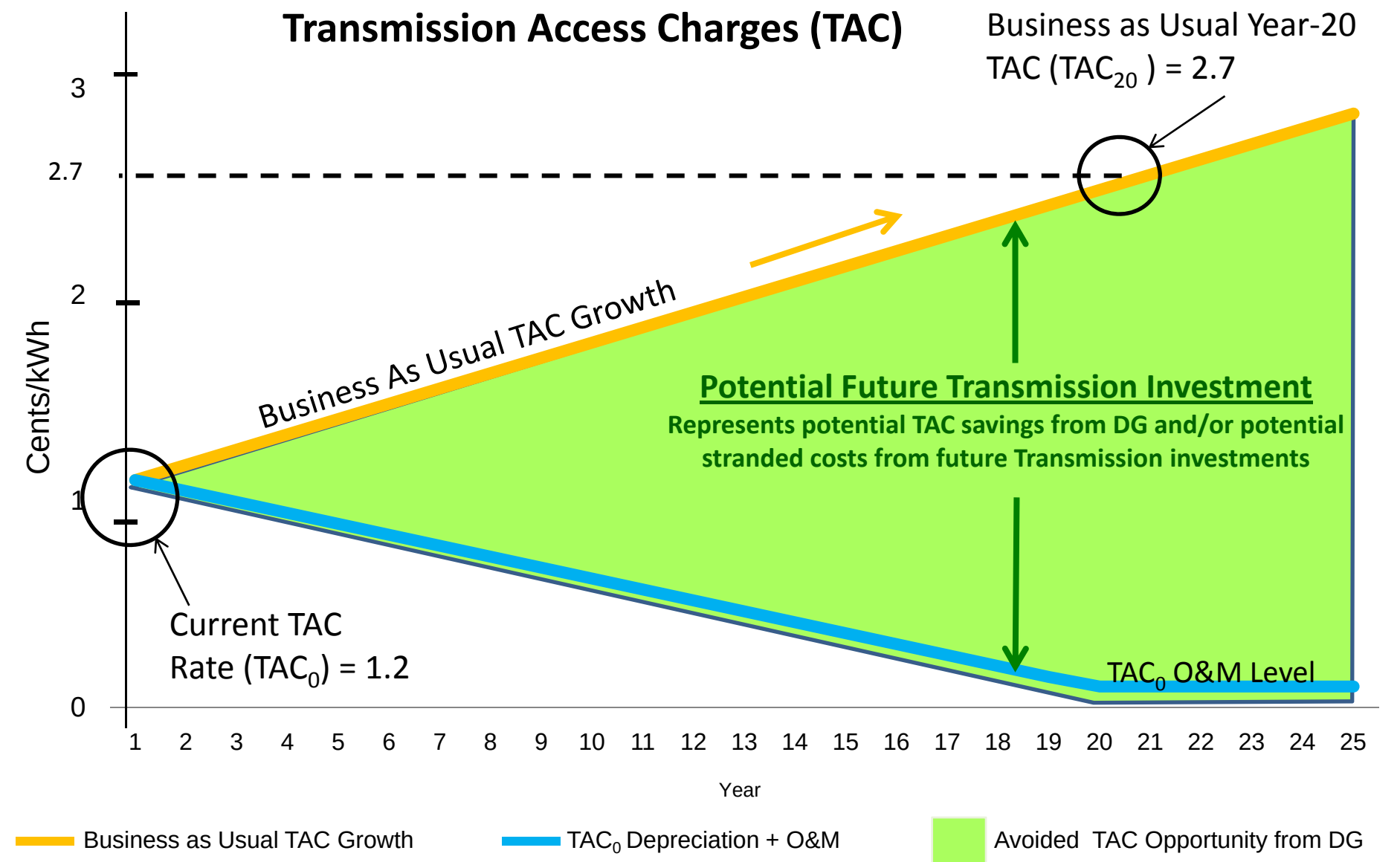
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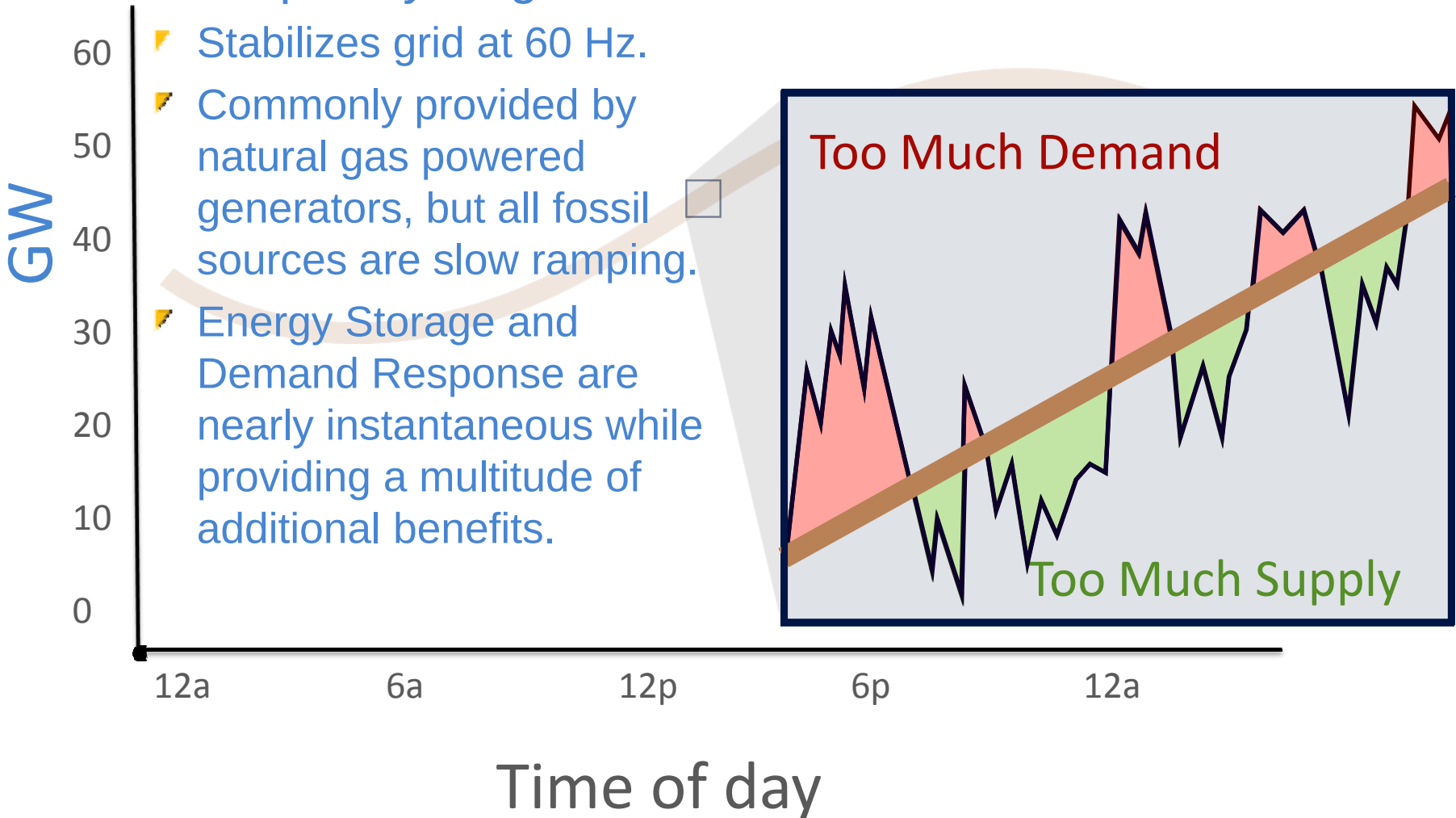
Avoiding Transmission and Fossil Backup Maximizing Ratepayer Value

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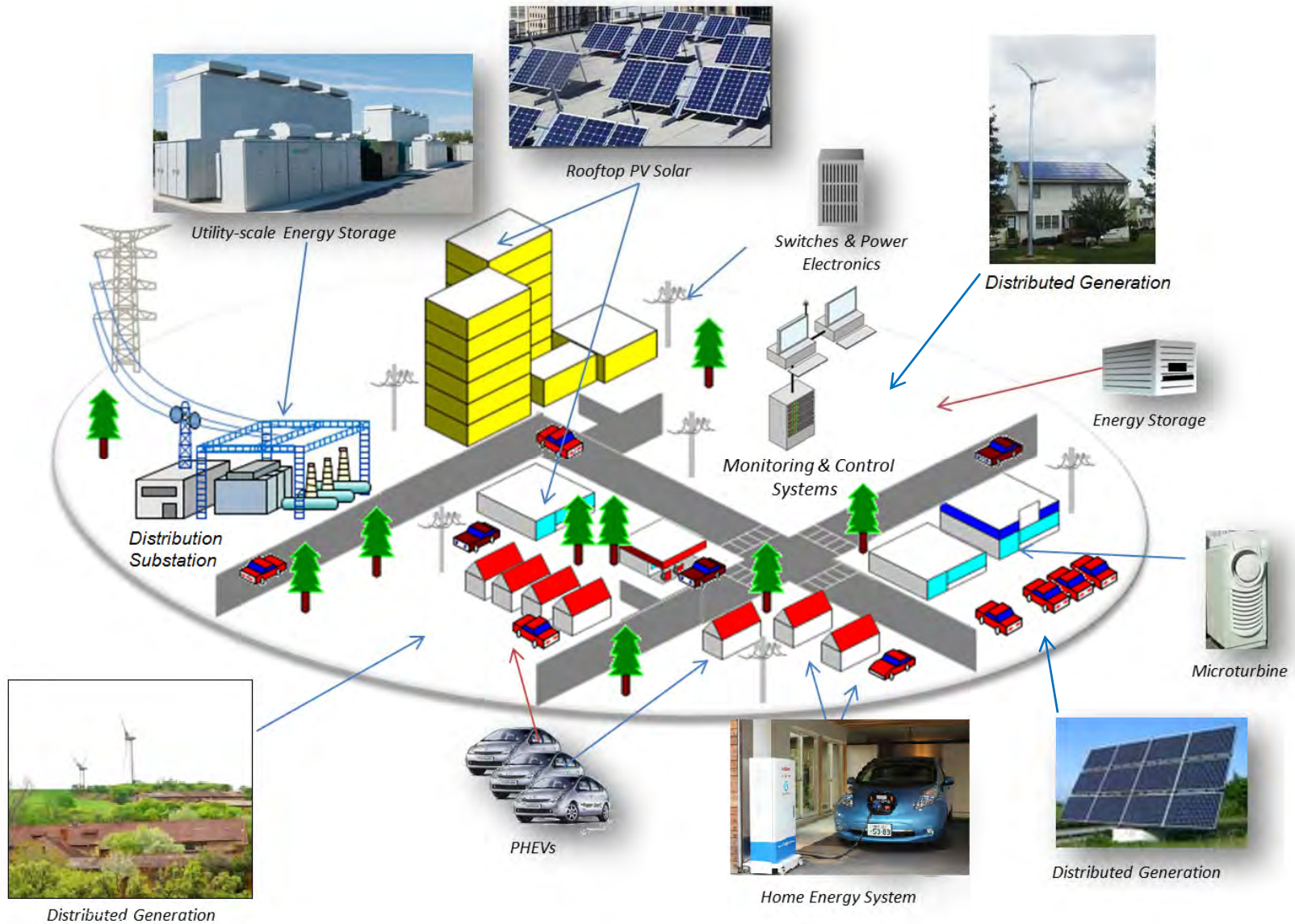
Frequency Regulation

- Stabilizes grid at 60 Hz.
- Commonly provided by natural gas powered generators, but all fossil sources are slow ramping.
- Energy Storage and Demand Response are nearly instantaneous while providing a multitude of additional benefits.

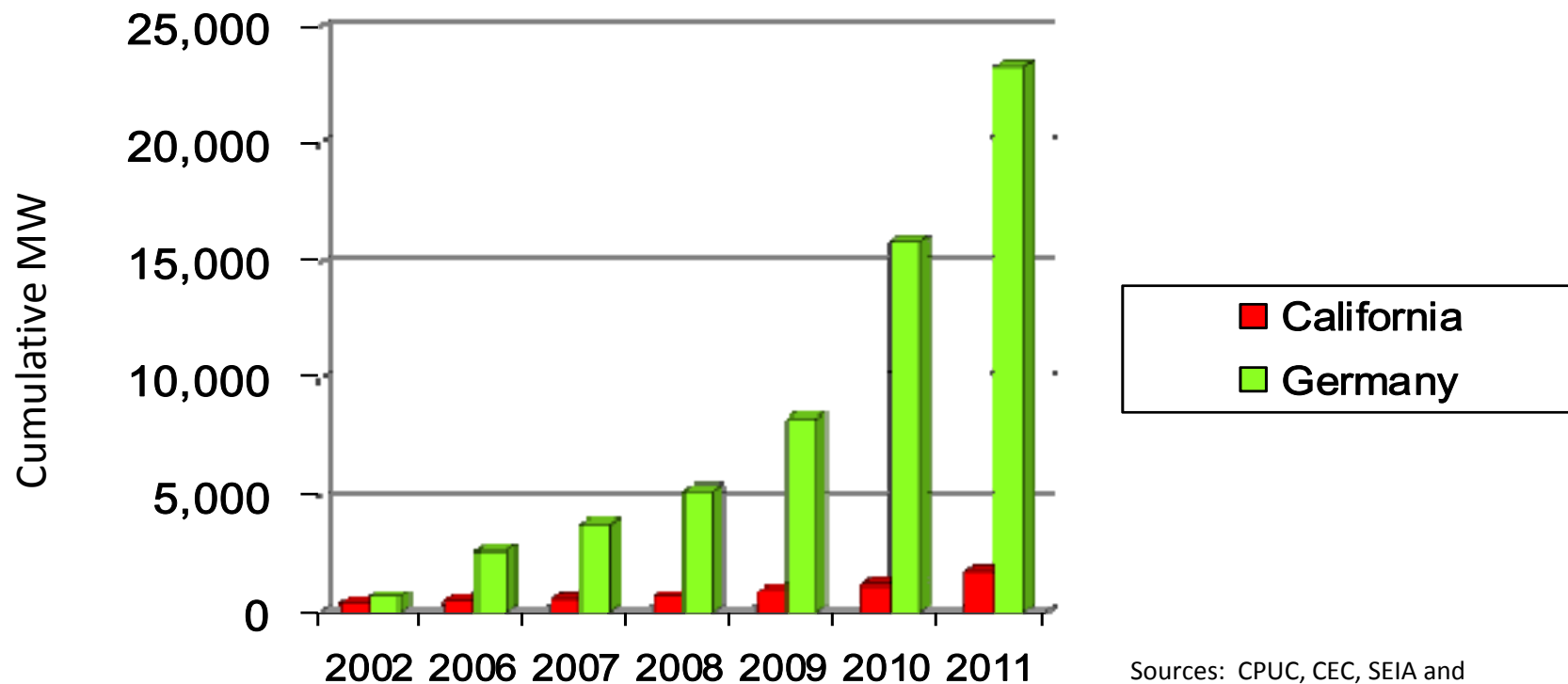


Back-Up Slides

Clean Coalition Vision = DG+DR+ES+EV+MC2



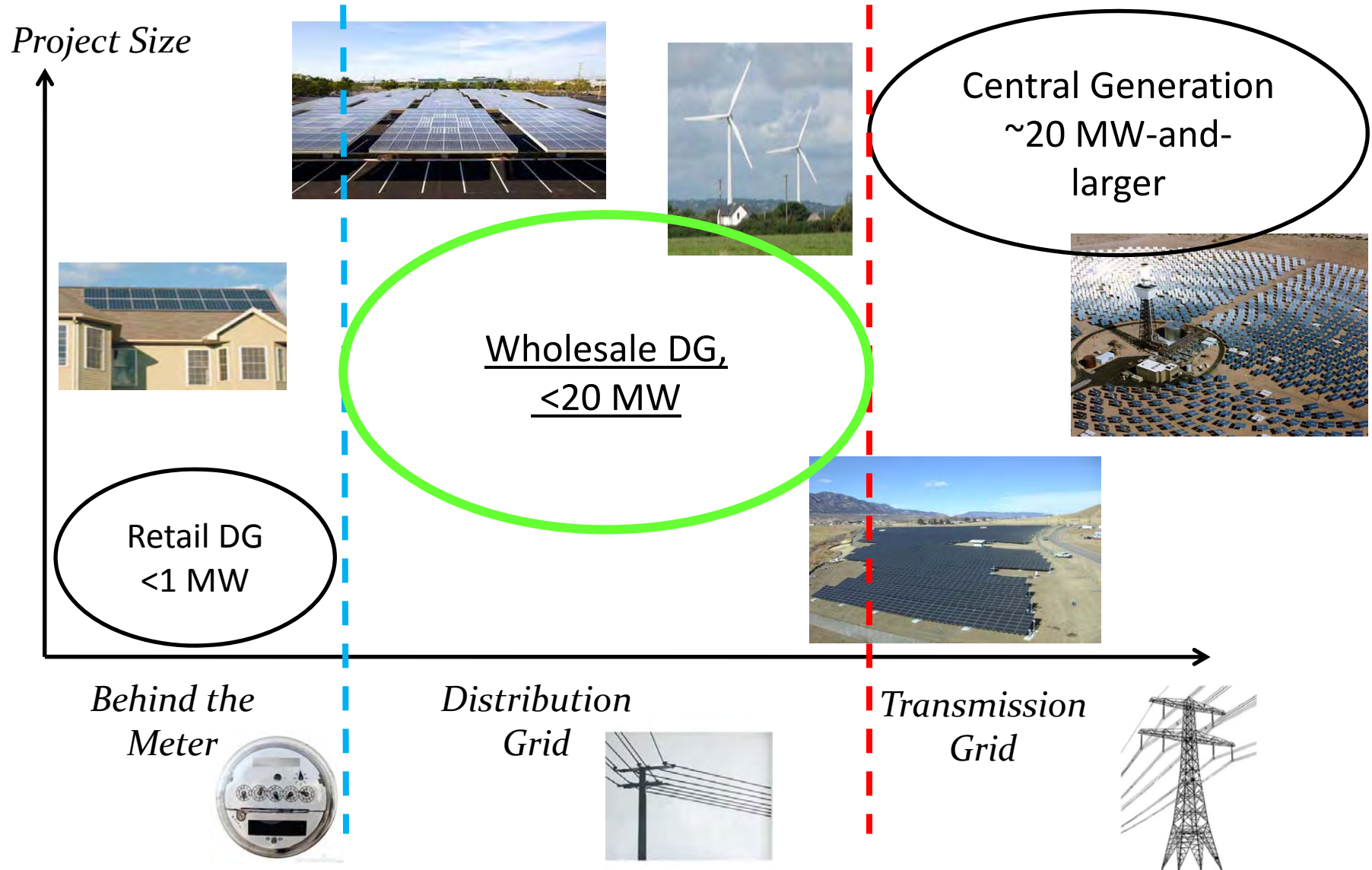
Solar Markets: Germany vs California (RPS + CSI + other)



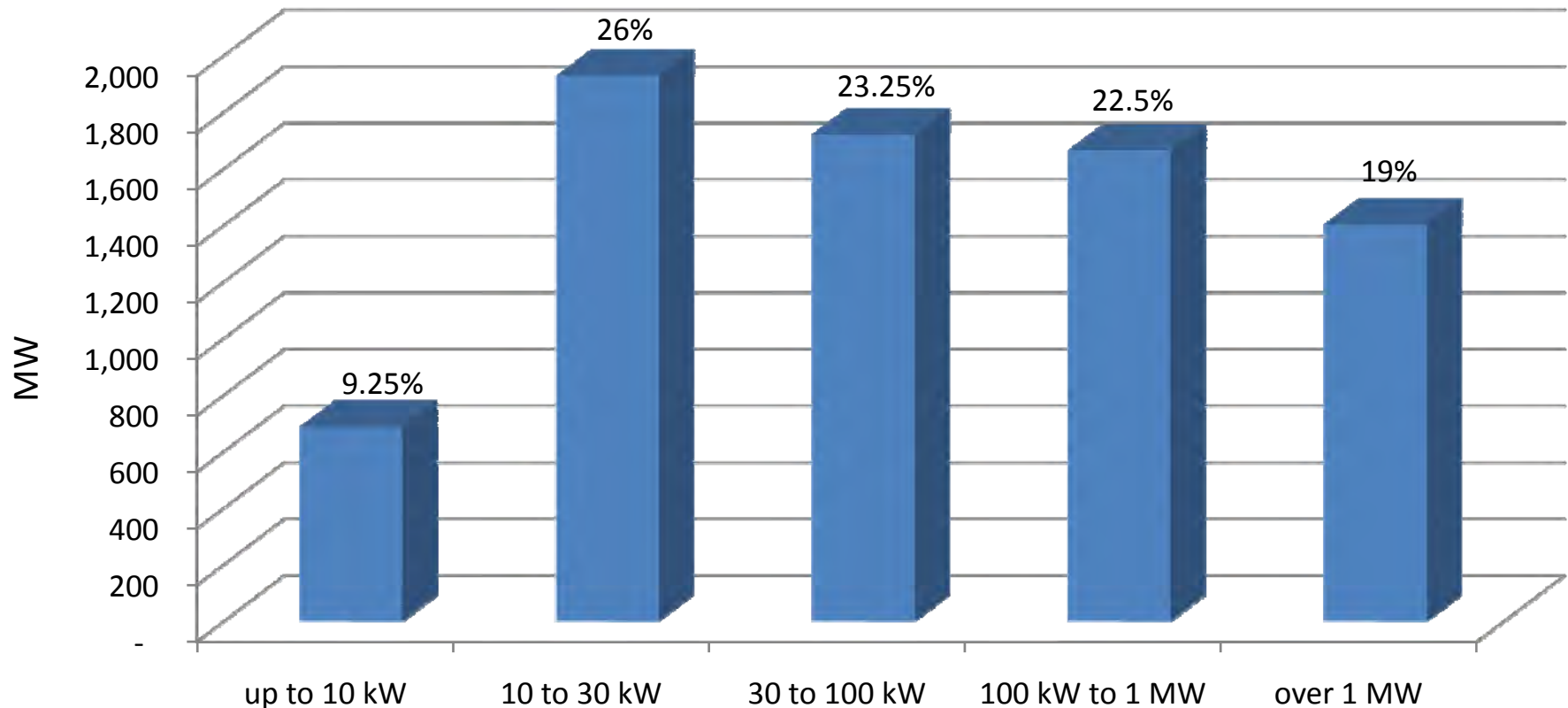
Sources: CPUC, CEC, SEIA and German equivalents.

Germany added nearly 15 times more solar than California in 2011, even though California's solar resource is 70% better!!!

Wholesale DG is the Critical & Missing Segment



German Solar PV Capacity Installed in 2010



Source: Paul Gipe, March 2011

Germany's solar deployments are almost entirely <2 MW rooftop projects interconnected to the distribution grid (not behind-the-meter)

Total Ratepayer Cost of Solar

	Distribution Grid					T-Grid
PV Project size and type	100kW roof	500kW roof	1 MW roof	1 MW ground	5 MW ground	50 MW ground
Required PPA Rate	15¢	14¢	13¢	12¢	11¢	10¢
T&D costs	0¢	0-1¢	1¢	1¢	1-2¢	2-4¢
Ratepayer cost per kWh	15¢	14-15¢	14¢	13¢	12-13¢	12-14¢

Sources: CAISO, CEC, and Clean Coalition, July 2011; see full analysis at www.clean-coalition.org/studies

The most cost-effective solar is ground-based WDG, not central station as commonly thought; due to immense transmission costs

- ✦ 75% of California IOU capital expenditures are made on the distribution grid (D-grid) and California ratepayers deserve maximized returns on their MASSIVE investments (2007 IEPR)
 - ✦ Investment needs to be future-proofed to allow significant penetrations of clean local energy
 - ✦ Confidentiality rules need to change to allow proper regulatory oversight of these massive ratepayer investments
- ✦ Germany and Spain are excellent proxies for assuring that California's existing D-grid can accommodate significant penetrations of clean local energy (May 2011 CEC/KEMA report)
- ✦ MPR is determined at point-of-interconnect and Wholesale Distributed Generation (WDG) and a Locational Benefits (LBs) adder is needed to compensate for extra value of WDG
 - ✦ Average extra LBs value of DG is in the neighborhood of 25% (Transmission Access Charges of 1.5 cents/kWh plus 10% for transmission line/congestion losses)
 - ✦ The LBs adder should be handled just like the Time-of-Delivery (TOD) adder
 - ✦ Ratepayers currently get massive free value from WDG in the form of uncompensated LBs

- ✦ Currently, developers are responsible for 100% of D-grid upgrade costs without any opportunity for reimbursement, EVER
 - ✦ This is different than transmission upgrade costs that are ALWAYS borne by the ratepayer
 - ✦ Recommendation for the 50% of the D-grid where LBs value is above average, utilities pay for D-grid upgrades and recover through the rate-base.
 - ✦ Ratepayers currently get massive free value from WDG in the form of uncompensated D-grid upgrade costs
- ✦ Wholesale Distributed Generation (WDG) interconnections need to be far more timely and transparent
 - ✦ WDG interconnection processes in IOU D-grids are expected to require an average of 2 years
 - ✦ WDG interconnection processes in the SMUD D-grid requires 6 months
 - ✦ Interconnection studies for 100 MW of WDG projects in its Feed-In Tariff program were completed in 2 months (performed by 2 guys)
 - ✦ 100 MW of WDG in SMUD territory is equivalent to 2,500 MW of WDG statewide
 - ✦ TWO GUYS for TWO MONTHS should be an achievable benchmark for all utilities