Clean Coalition
Making Clean Local Energy Accessible Now

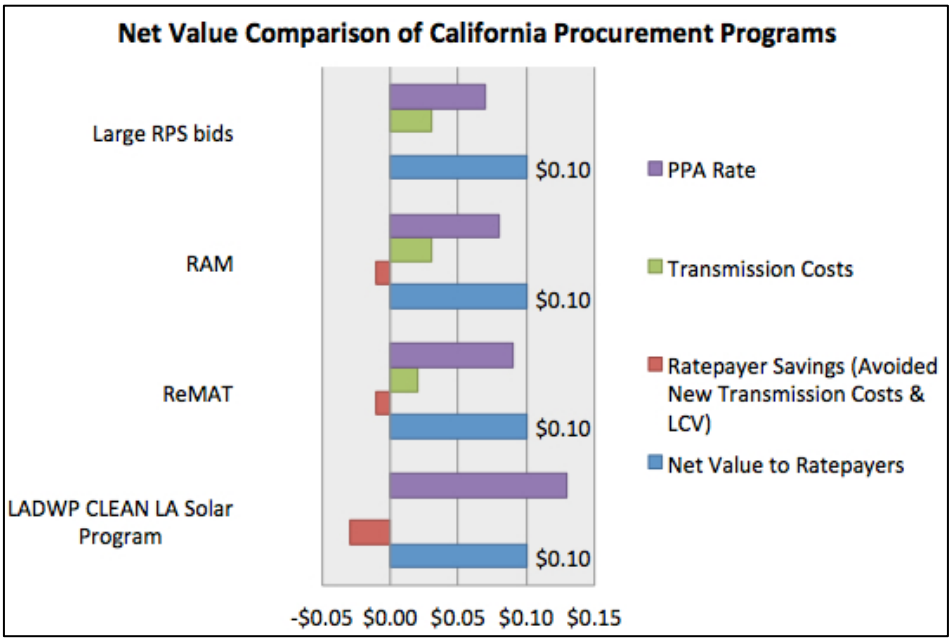
CLEAN L.A. Solar is driving the deployment of cost-effective, in-basin solar generation
March 7, 2014

The Clean Coalition offers the following information about the ratepayer benefits of the CLEAN L.A. Solar Program:

I. Comparison of California solar procurement mechanisms highlights the effectiveness of CLEAN Programs.
II. Local generation has higher locational value for ratepayers.
III. The CLEAN approach drives down costs for ratepayers.

I. Comparison of California Renewable Energy Procurement Mechanisms Highlights the Effectiveness of CLEAN Programs

In the recent presentation to the Los Angeles Department of Water and Power (LADWP) Board, the Office of Public Accountability (OPA) presented a comparison of procurement programs and apparent costs. This comparison reflected only the contract price of power purchase agreements (PPAs), and ignored the differences in value included in these various contracts, and the additional costs associated with delivering "cheap" power to customers. The "sticker price" can be very misleading – shipping, handling, and other fees and charges for additional services required must always be considered. The following chart shows that the net value to ratepayers of the LADWP CLEAN L.A. Solar Program is the same as the net value of three California renewable procurement programs. This chart does not include the economic benefits to the community, which would make the net value of the LADWP CLEAN L.A. Solar Program much higher.



Source: Clean Coalition, March 2014

The following chart provides a more detailed comparison of California solar procurement programs. Note that while AB 1969 / SB 32 (ReMAT) only includes projects connected to the distribution system, the projects that win are generally located in the least expensive sites and do not have deliverability to local load. Therefore, these projects do not avoid the majority of transmission costs and have less local capacity value. Transmission costs and other ratepayer costs of delivery are explained in detail in Section II below.

Comparison of California Solar Procurement Programs

	Net Metering	LADWP FiT/CLEAN	AB 1969 / SB 32 (now ReMAT)	RAM	Large RPS Solicitations
Source & Use of Power	Onsite for customer average load offset	Local Wholesale serving local load	In-State Wholesale for regional load	In-State, Remote Wholesale for regional & Statewide load	In & out of State Remote Wholesale for State wide load
Typical Solar Project Size	5 kW residential up to 1000 kW commercial	500-1000 kW typical, max 3000 kW	Max (typical) 3000 kW	Max (typical) 20,000 kW	Typical 50,000 – 300,000 kW
Price Basis	Retail rate	Initial wholesale market rate + scheduled decrease	Market rate. Price offer increase or decreases based on response	Single bid auction	Bid and negotiation
PPA Price for 2016 COD	Bill credit at tiered retail rate	13¢/kWh	9¢/kWh	8¢/kWh	7¢/kWh
Average Ratepayer Cost of Delivery of Power	0	0	2¢/kWh	3¢/kWh	3¢/kWh
Ratepayer Savings	Reduced load	RPS credit, Resource Adequacy, Local Capacity Value, Resilience	RPS credit, Resource Adequacy, some Local Capacity Value	RPS credit, Resource Adequacy	RPS credit, Resource Adequacy

Source: Clean Coalition, March 2014

OPA also implies that the 100 MW CLEAN L.A. Solar program is being procured without the use of competitive bidding or a transparent market-based formula. This is incorrect.

Initial program pricing was established by market bids to the 10 megawatt (MW) pilot program and is then subject to aggressive price declines on a clear and transparent schedule of 7.5% every six months to drive procurement below market rates for the product being procured (PV located near loads).

II. Local Generation Has Greater Locational Value for Ratepayers

Generating power locally provides tremendous value to ratepayers. Energy procured through CLEAN L.A. Solar will meet required local resource capacity while avoiding the very substantial costs of delivering power through the transmissions system and deferring or avoiding the expense of additional new transmission infrastructure. Transmission Access Charges (TACs) alone – or comparable use costs – currently add a 20-year levelized cost of 2.7¢ to the cost of every kWh delivered through the transmission system. Line losses, congestion charges, and local resource adequacy requirements add additional costs. Avoiding these costs directly improves the value to ratepayers, and deferring the need for new transmission infrastructure adds an average of 3¢/kWh in further value.[i]

A May 2012 study by Southern California Edison (SCE) found that transmission upgrade costs for their share of the Governor's goal of 12,000 MW of distributed generation (DG) could be reduced by over $2 billion from the trajectory scenario. The lower costs were associated with the "guided case" where 70 percent of projects would be located in urban areas, and the higher costs were associated with the "unguided case" where 70 percent of projects would be located in rural areas.[ii]

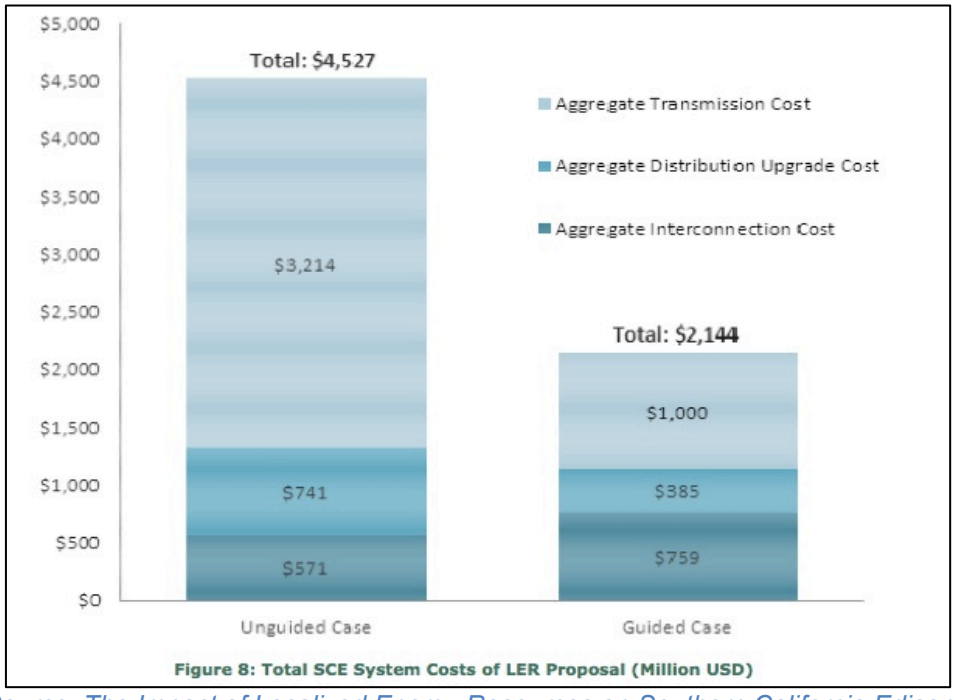


Figure 8: Total SCE System Costs of LER Proposal (Million USD)

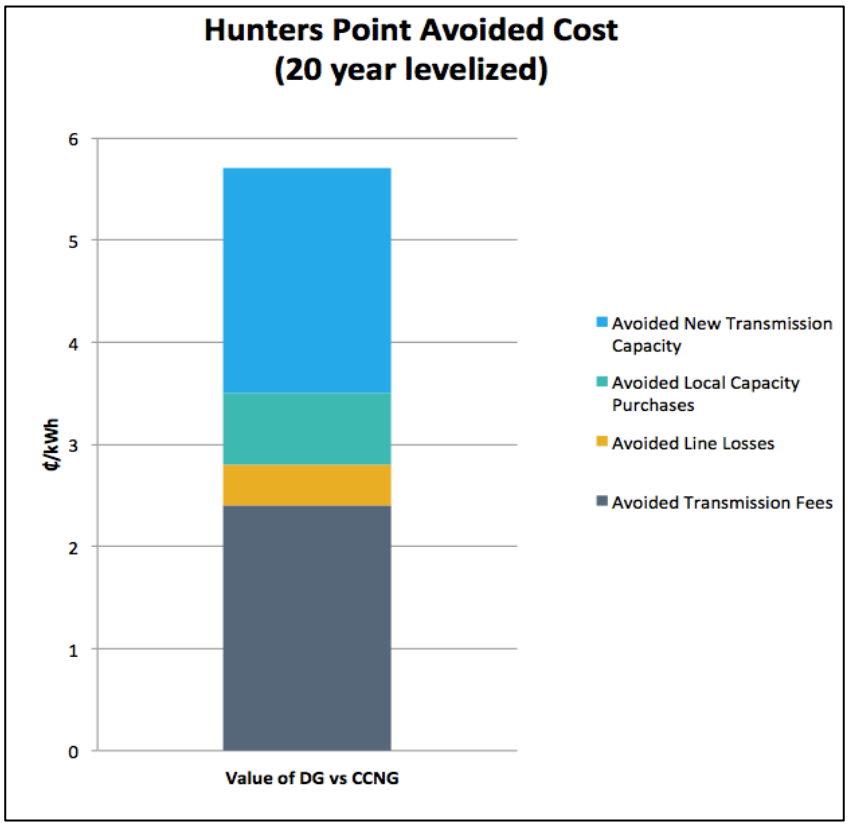
Source: The Impact of Localized Energy Resources on Southern California Edison's Transmission and Distribution System, SCE, May 2012

It is important to note that the cost of upgrades triggered by generation connecting to the transmission system is reimbursed to the project at ratepayer expense, and these costs are therefore not reflected in the PPAs for these facilities. In contrast, local projects connecting to the distribution system are not reimbursed for upgrades, resulting in the full cost being reflected in their PPAs. Moreover, the upgrades and all associated maintenance and replacement costs are being provided at no additional charge to ratepayers.

This local generating capacity may also avoid, reduce, or defer additional new transmission capacity that would otherwise be needed. For example, the Long Island Power Authority (LIPA) has recently offered a 7¢/kWh premium to 40 MW of appropriately sited solar DG facilities to encourage locational capacity sufficient to avoid $84,000,000 in new transmission costs that would otherwise be incurred, resulting in a net savings of $60,000,000.[iii]

The cost of new transmission varies, but average costs for approved projects in California in recent years have been approximately $1,000,000 per MW. This amount is in line with the results of the SCE study of costs associated with siting projects remote from the loads they serve. If 100 MW of rooftop procurement were shifted to remote projects, ratepayers would foot the bill for $100 million in associated transmission costs.

A recent study by the Clean Coalition of the benefits of DG integrated with intelligent grid solutions for Hunters Point in San Francisco found the following locational value savings for ratepayers achieved through local generation.[iv]

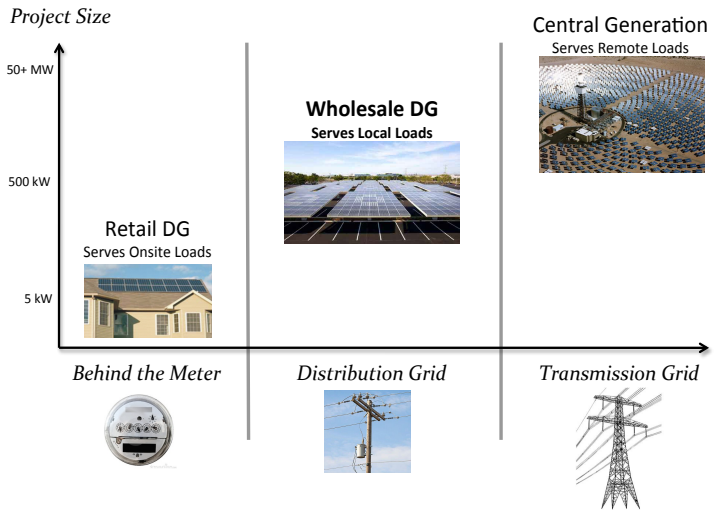


Source: Clean Coalition Analysis of Locational Value of Hunters Point DG Projects

III. The CLEAN Approach Drives Down Costs for Ratepayers

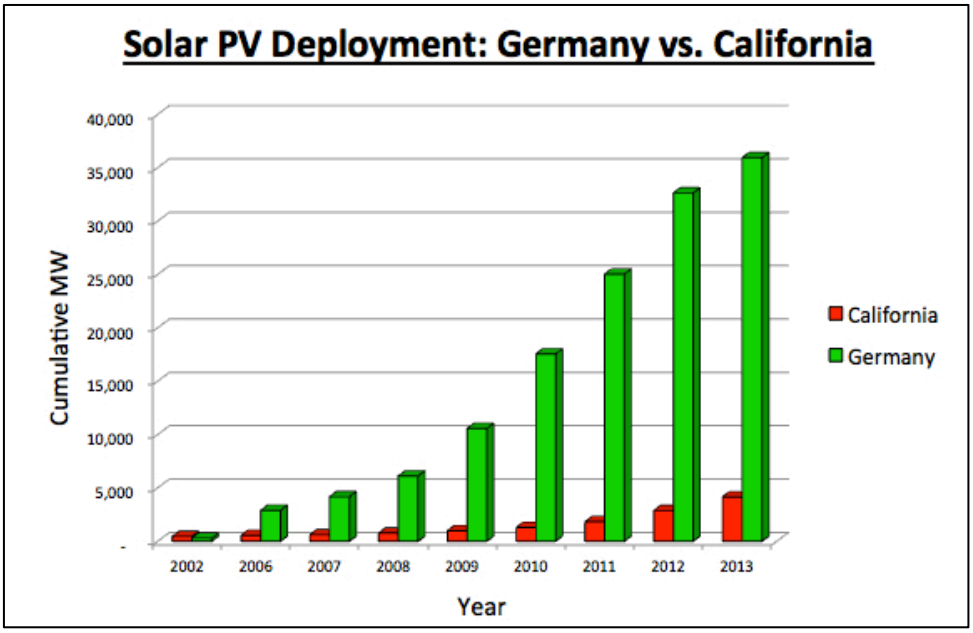
Clean Local Energy Accessible Now (CLEAN) Programs – also known as feed-in tariffs with streamlined interconnection procedures – are the world's most effective energy procurement policy to drive project deployment and increase market efficiency. In fact, the vast majority of renewable energy deployed globally has come online through a CLEAN Program.

CLEAN Programs remove barriers and uncertainties that inhibit the growth of renewable energy generation by providing transparency, longevity, and certainly in the marketplace. These programs simplify the process to build local energy projects, connect them to the distribution grid, and establish long-term contracts to sell the power produced to utilities to serve local loads without transmission costs. Projects that come online through CLEAN Programs are known as wholesale distributed generation (WDG) projects. With a CLEAN Program in place, financing local energy projects becomes much easier, and the whole community benefits from the reduced costs of generating local renewable energy. This major market segment, which uses available sites within communities, has yet to be effectively addressed by procurement programs in California.



Wholesale distributed generation comprises a critical segment of renewable energy generation.
Source: Clean Coalition, 2014

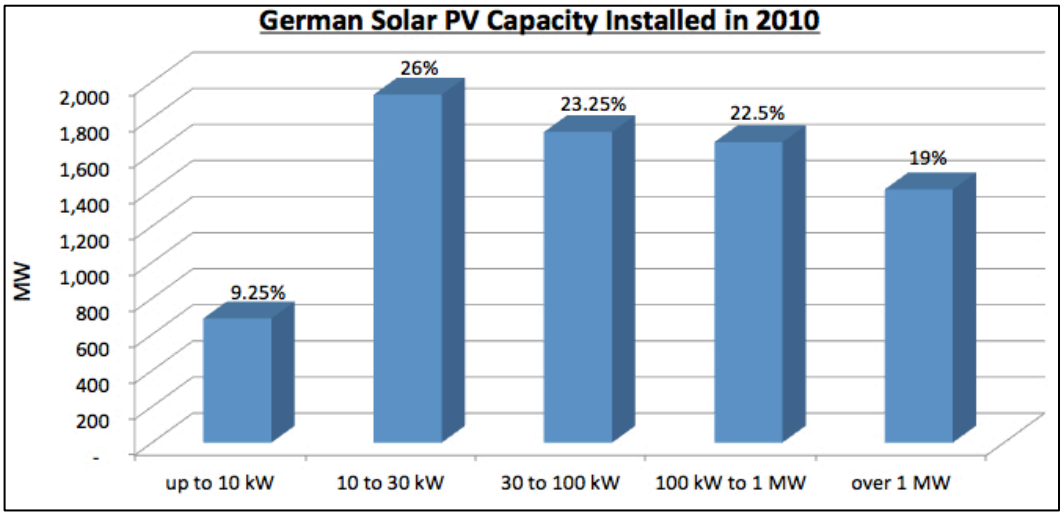
Germany offers the best example of how a CLEAN Program successfully results in a streamlined, efficient market. In 2002, Germany and California each had less than 1 MW of solar PV capacity installed. Since then, through its use of this approach, Germany has installed ten times the total capacity achieved through all California programs – even though its population is only twice as large.



Source: Clean Coalition, data from the CPUC, CEC, SEIA and German equivalents, 2013.

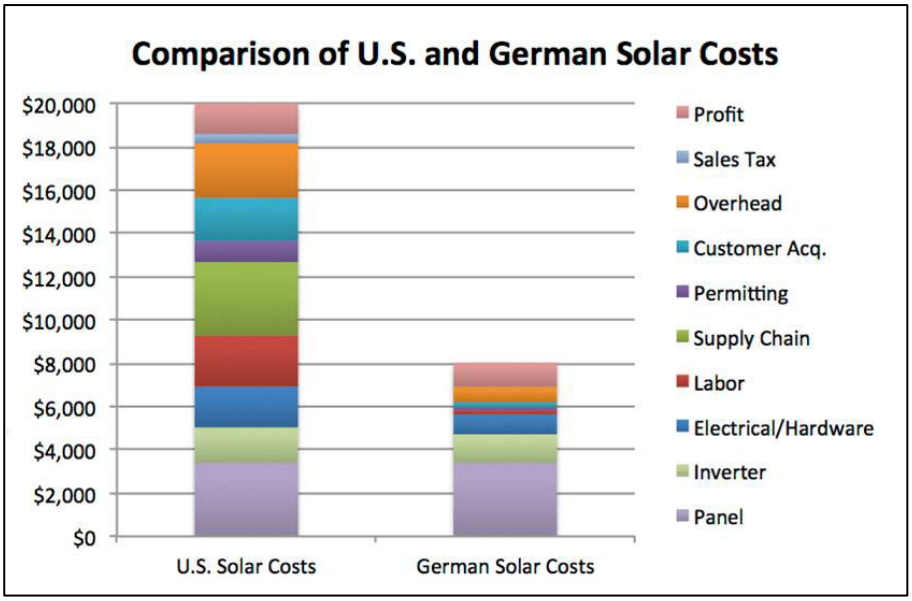
Notably, more than 80% of Germany's installed solar PV capacity is on rooftops. This local energy serves local load without incurring the cost of transmission and reflects the

broad community participation enabled by the simplicity and predictability of CLEAN Programs.



Source: Clean Coalition, data from Paul Gipe, 2011.

Through its CLEAN Program, Germans have streamlined the process of bringing clean local energy online – making their solar market decidedly more efficient than the U.S. solar market. Current rooftop solar installations in the U.S. are 2.5 times more expensive than in Germany, despite the fact that system equipment costs are largely comparable. The Germans have realized cost reductions for overhead, customer acquisition, and permitting through their CLEAN Program. CLEAN L.A. Solar will result in similar cost reductions as the local industry gains greater experience developing projects in a predictable market, which will also improve supply chain and labor efficiencies.



Source: Clean Coalition, data from Forbes, 2012

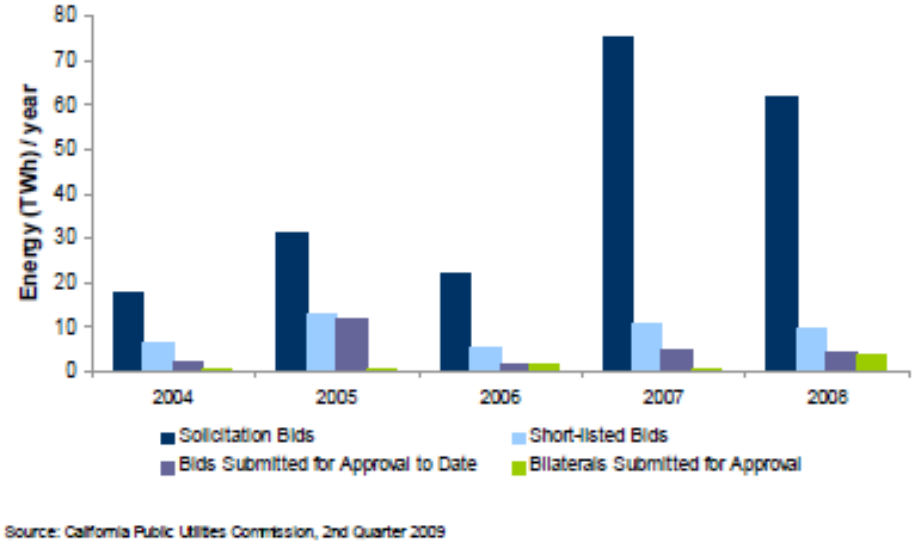
California, with its superior solar resource and applicable tax incentives, has the potential to bring rooftop solar online even cheaper than in Germany. Replicating Germany's market scale and efficiency can yield rooftop solar power between 5¢ and 7¢/kWh in California. Add in the cost of permitting, interconnection, and any applicable grid upgrades paid by facility owners, and the total cost of delivered energy to Californians comes out to 7-9¢/kWh.

German Solar Pricing Translates to 5¢/kWh

Project Size	Euros/kWh	USD/kWh	California Effective Rate $/kWh
Under 10 kW	0.145	0.1903	0.0762
10 kW to 40 kW	0.138	0.1805	0.0722
40.1 kW to 1 MW	0.123	0.161	0.0644
1.1 MW to 10 MW	0.101	0.1317	0.0527

California's effective rate is reduced 40% due to tax incentives and then an additional 33% due to the superior solar resource.
Source: Clean Coalition, data Paul Gipe, 2013

To date, California's market has remained prohibitively complex, and no solar project has delivered energy at such a low price. While Los Angeles' Office of Public Accountability (OPA) touts auctions and similar solicitations as better policies for procuring renewable energy, there are significant problems with the competitive solicitation approach. To begin, a very large percentage of bids are unsuccessful in competitive solicitations. Fewer than 1 in 10 project bids are actually developed, which results in high administrative costs for the program.



Source: Fewer than 1 in 10 solicitation bids are submitted for approval.
Source: California Public Utilities Commission (2009)

Further, the risks of competitive solicitations for project developers raise the costs of doing business for all developers, and results in higher prices for consumers. Losing bids tie up prime siting options and flood interconnection queues. Winning bids include unrealistically low offers based on speculative future pricing rather than firm current pricing, resulting in projects that may never be built.

CLEAN Programs, on the other hand, drive down prices for ratepayers. These programs offer clear guidance to the market through defined prices, eliminating all projects that can't meet the pricing before plans impact siting and interconnection. CLEAN L.A. Solar's clear and predictable purchase offer, and the simple, standardized contract for use between utilities and energy generators is a critical step towards streamlining the development of clean local energy.

Further, CLEAN Programs secure projects that will be built immediately and proven to deliver power with 12 to 18 months. Not only does this approach nearly eliminate speculative projects, but it also drives down solar development costs.

The experience curve for solar development, and related economies of scale, result in a well-established price reduction curve for both installed costs and the ultimate price of energy. Evidence in the U.S. and abroad strongly supports the experience curve effect and a broadly reported 20% reduction in costs with each doubling of the market.[v]

This is particularly important given the scheduled loss of current Investment Tax Credit rates and property tax exemptions – deployments procured in advance of these dates will be able to offer ratepayers these cost savings, while also establishing a lower base price. Accelerating the deployment curve now will result in lower installed cost in every subsequent year than would otherwise be realized, as clearly seen in German installed costs today.

About the Clean Coalition

The Clean Coalition is a California-based nonprofit organization whose mission is to accelerate the transition to local energy systems that deliver cost-effective renewable energy, strengthen local economies, foster environmental sustainability, and enhance energy security. The Clean Coalition drives policy innovation to remove barriers to the procurement and interconnection of Wholesale Distributed Generation, integrated with Intelligent Grid solutions, such as demand response, energy storage, and advanced inverters. The Clean Coalition also works with utilities to develop demonstration projects that prove that local renewables can provide at least 25% of the total electric energy consumed within the distribution grid, while maintaining or improving grid reliability. The Clean Coalition is active in numerous proceedings before California agencies and other state agencies throughout the United States.

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References

[i] See the Clean Coalition's Locational Benefits of Distributed Generation, available at http://www.clean-coalition.org/site/wp-content/uploads/2013/11/Locational-Benefits-Brief-08_tk-6-Nov-2013.pdf.

[ii] The Impact of Localized Energy Resources on Southern California Edison's Transmission and Distribution System, SCE, May 2012.

[iii] Proposal Concerning Modifications to LIPA's Tariff for Electric Service, available at http://www.lipower.org/pdfs/company/tariff/proposals-FIT070113.pdf. LIPA's guidance states: "The rate will be a fixed price expressed in $/kWh to the nearest $0.0000 for 20 years applicable to all projects as determined by the bidding process defined below, plus a premium of $0.070 per kWh paid to projects connected to substations east of the Canal Substation on the South Fork of Long Island."

[iv] Clean Coalition, Hunters Point Benefits Analysis, available at http://www.clean-coalition.org/site/wp-content/uploads/2013/12/HPP-Benefits-Analysis-19_jb-20-Dec-2013.pdf

[v] PV module installed costs have decreased by 15% to 22% for every doubling of cumulative installed capacity. International Energy Agency, *Technology Roadmap, Solar Photovoltaic Energy* (2010)