



# **CLEAN Programs:** **Bringing Clean Energy to Your Community**

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- ✔ Clean Coalition – background and vision
- ✔ Defining CLEAN Programs
- ✔ Benefits & results
- ✔ Current landscape
- ✔ How to design and implement
- ✔ Q&A
- ✔ Collaborating to magnify impacts

# Clean Coalition – Mission and Advisors

## Mission

To accelerate the transition to local energy systems through innovative policies and programs that deliver cost-effective renewable energy, strengthen local economies, foster environmental sustainability, and enhance energy security

## Board of Advisors

### Jeff Anderson

*Co-founder and Former ED, Clean Economy Network*

### Josh Becker

*General Partner and Co-founder, New Cycle Capital*

### Jeff Brothers

*CEO, Sol Orchard*

### Jeffrey Byron

*Vice Chairman National Board of Directors, Cleantech Open; Former California Energy Commissioner (2006-2011)*

### Rick DeGolia

*Senior Business Advisor, InVisM, Inc.*

### Mark Fulton

*Managing Director, Global Head of Climate Change Investment Research, DB Climate Change Advisors, a member of the Deutsche Bank Group*

### John Geesman

*Former Commissioner, California Energy Commission*

### Patricia Glaza

*Principal, Arsenal Venture Partners; Former Executive Director, Clean Technology and Sustainable Industries Organization*

### Amory B. Lovins

*Chairman and Chief Scientist, Rocky Mountain Institute*

### L. Hunter Lovins

*President, Natural Capitalism Solutions*

### Dan Kammen

*Director of the Renewable and Appropriate Energy Laboratory at UC Berkeley; Former Chief Technical Specialist for Renewable Energy and Energy Efficiency, World Bank*

### Fred Keeley

*Treasurer, Santa Cruz County, and Former Speaker pro Tempore of the California State Assembly*

### Felix Kramer

*Founder, California Cars Initiative*

### Ramamoorthy Ramesh

*Founding Director, U.S. Department of Energy SunShot Initiative*

### Governor Bill Ritter

*Director, Colorado State University's Center for the New Energy Economy, and Former Colorado Governor*

### Terry Tamminen

*Former Secretary of the California EPA and Special Advisor to CA Governor Arnold Schwarzenegger*

### Jim Weldon

*CEO, Solar Junction*

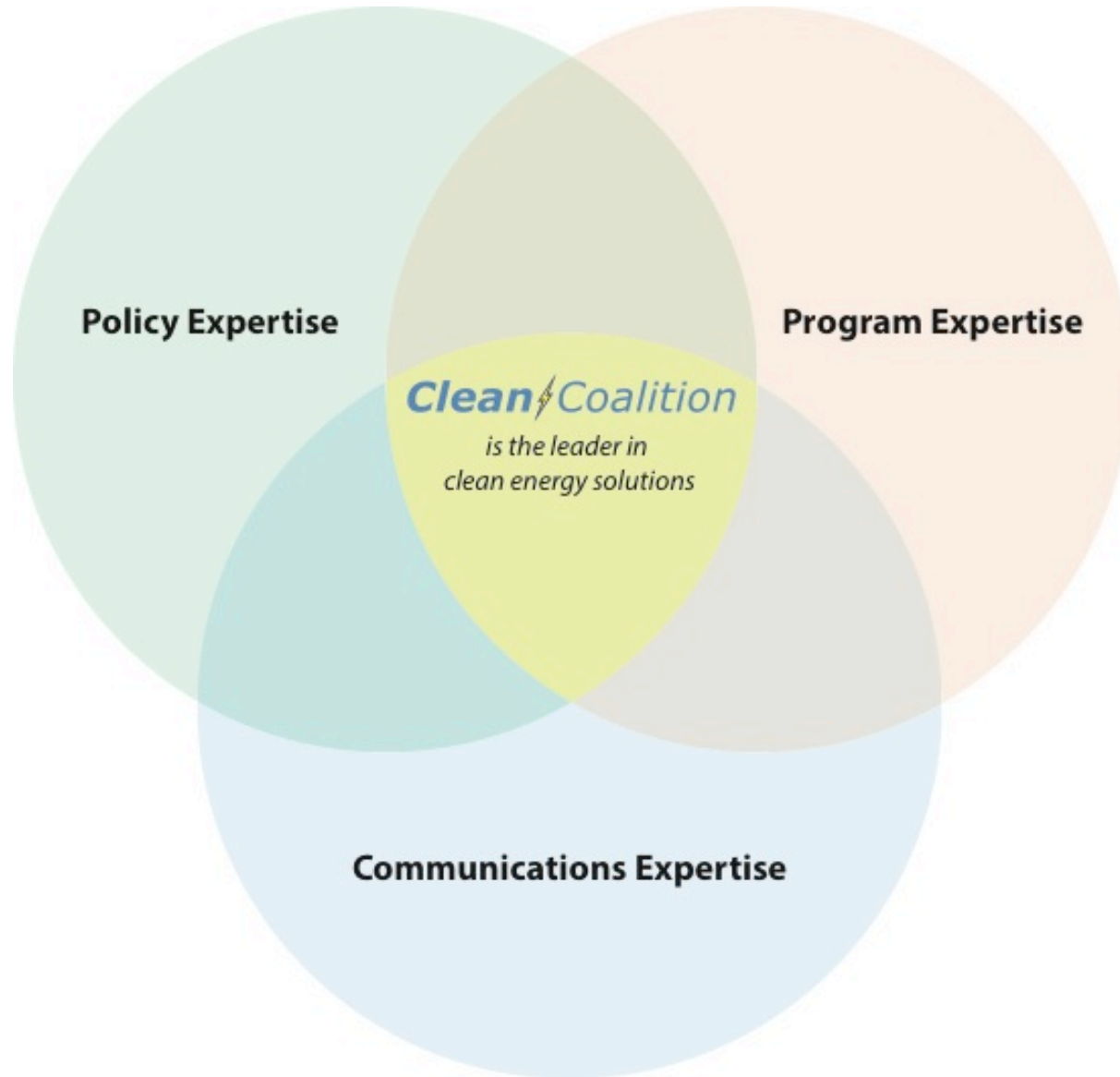
### R. James Woolsey

*Chairman, Woolsey Partners, and Venture Partner, Lux Capital; Former Director of Central Intelligence*

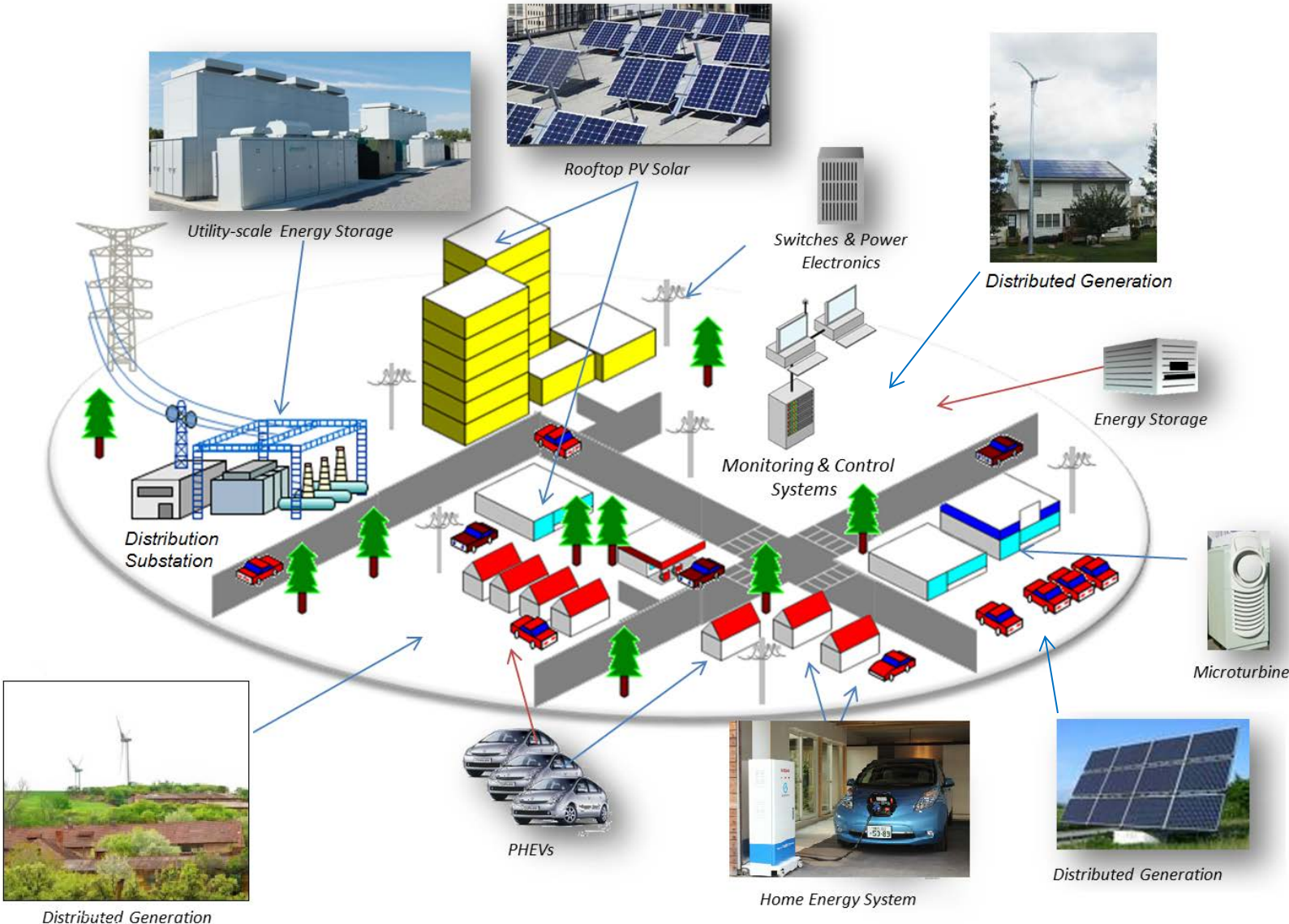
### Kurt Yeager

*Vice Chairman, Galvin Electricity Initiative; Former CEO, Electric Power Research Institute*

# Making Clean Local Energy Accessible Now



# Clean Coalition's Ultimate Vision



## **CLEAN** = Clean Local Energy Accessible Now

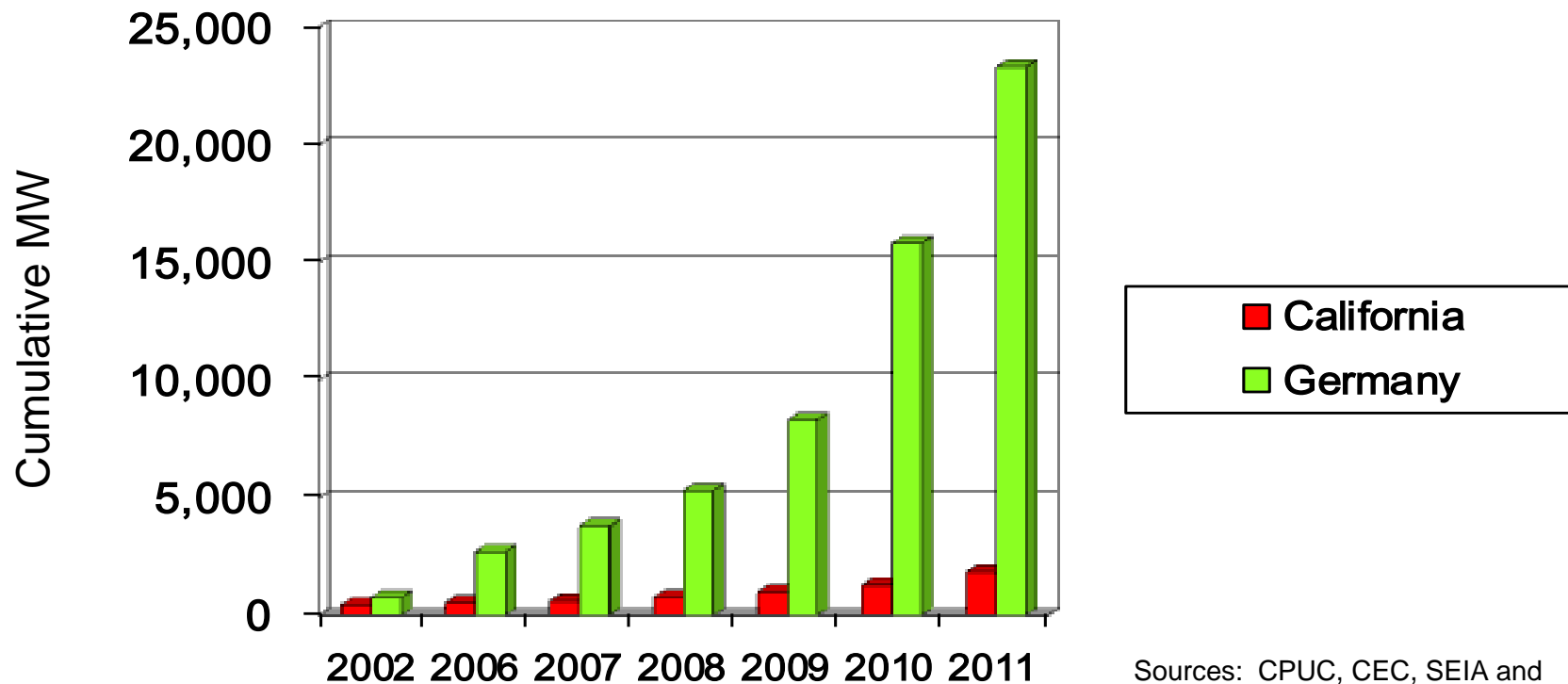
### **CLEAN Features:**

- **Procurement:** Standard and guaranteed contract between the utility and a renewable energy facility owner to purchase 100% of generation at a predefined rate for a long duration
- **Interconnection:** Predictable, streamlined distribution grid access



- **Financing:** Low-risk contracts will attract lower-interest financing

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



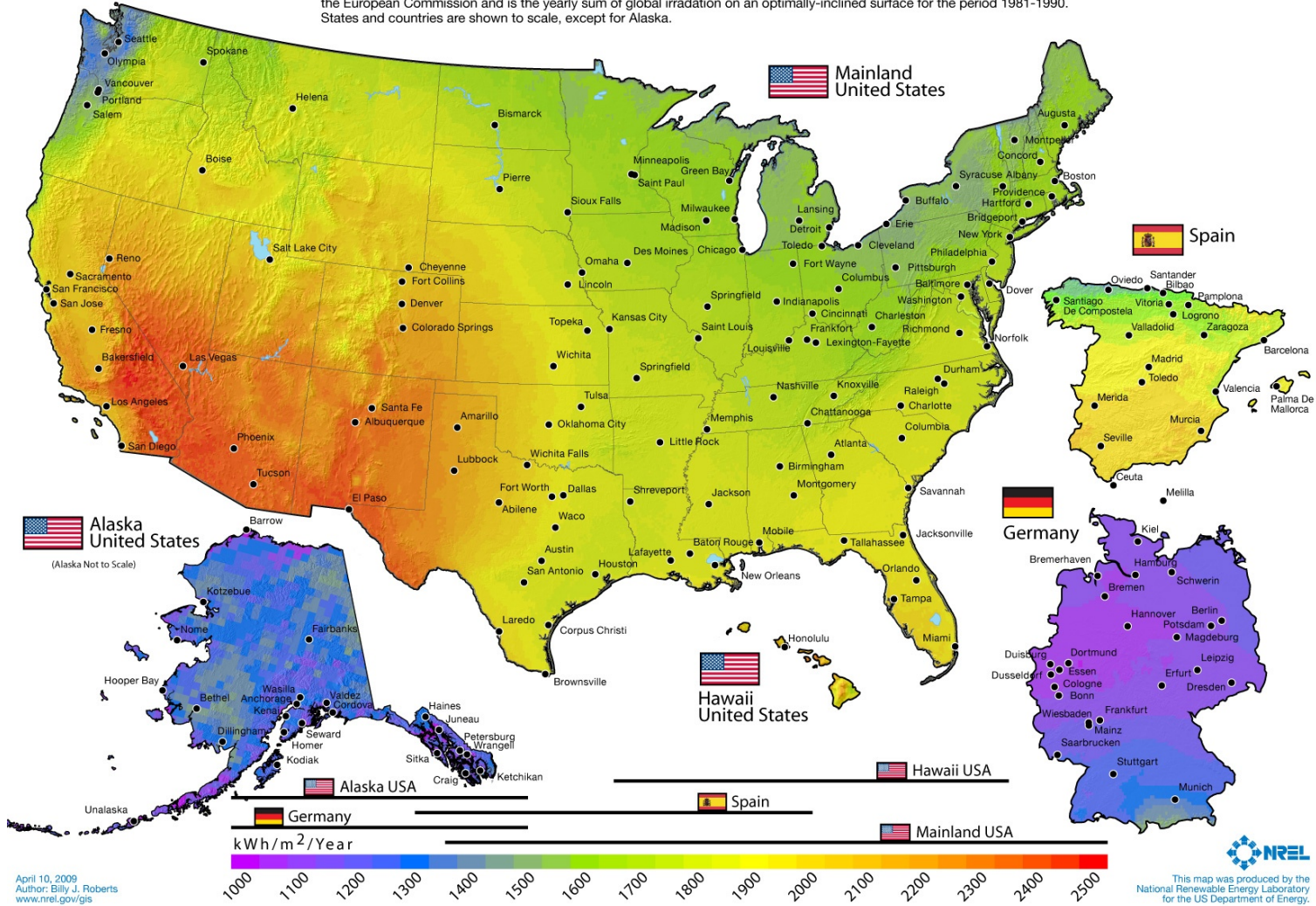
Sources: CPUC, CEC, SEIA and German equivalents.

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

# US has far better solar resource than Germany

## Photovoltaic Solar Resource: United States - Spain - Germany

Annual average solar resource data are for a solar collector oriented toward the south at a tilt = local latitude. The data for Hawaii and the 48 contiguous states are derived from a model developed at SUNY/Albany using geostationary weather satellite data for the period 1998-2005. The data for Alaska are derived from a 40-km satellite and surface cloud cover database for the period 1985-1991 (NREL, 2003). The data for Germany and Spain were acquired from the Joint Research Centre of the European Commission and is the yearly sum of global irradiation on an optimally-inclined surface for the period 1981-1990. States and countries are shown to scale, except for Alaska.

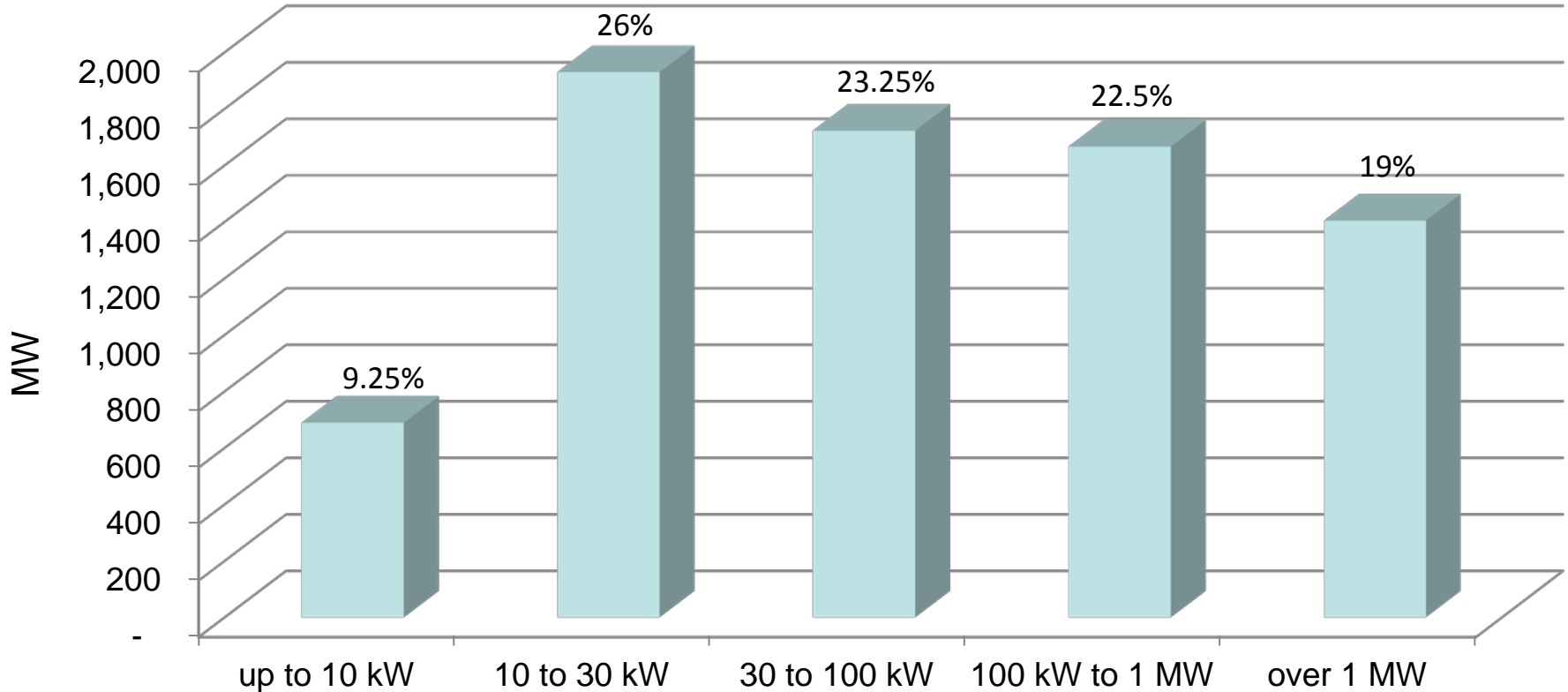


April 10, 2009  
 Author: Billy J. Roberts  
 www.nrel.gov/gis

This map was produced by the National Renewable Energy Laboratory for the US Department of Energy.



## German Solar PV Capacity Installed in 2010



Source: Paul Gipe, March 2011

**Germany's deployed solar capacity is essentially 100% WDG and about 90% is on rooftops**

Project Size	Euros/kWh	USD/kWh	California Effective Rate \$/kWh
Under 10 kW	0.195	0.2470	0.0993
10 kW to 40 kW	0.185	0.2344	0.0942
40.1 kW to 1 MW	0.165	0.2091	0.0841
1.1 MW to 10 MW	0.135	0.1711	0.0688

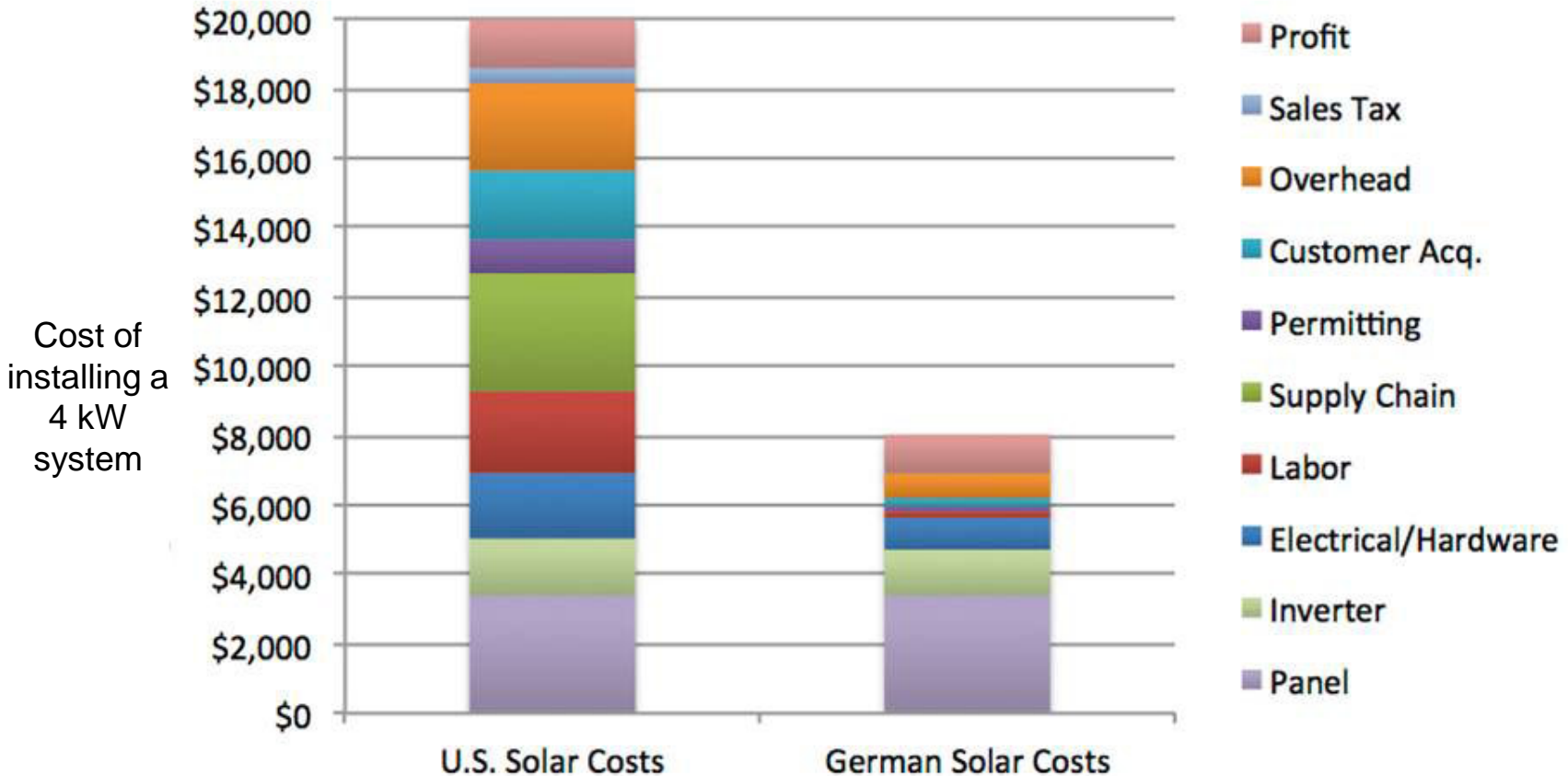
Source: [http://solarindustrymag.com/e107\\_plugins/content/content.php?content.10624](http://solarindustrymag.com/e107_plugins/content/content.php?content.10624), June 2012

- Conversion rate for Euros to Dollars is €1:\$1.27
- California's effective rate is reduced 40% due to tax incentives and then an additional 33% due to the superior solar resource

**Replicating German scale and efficiencies would yield rooftop solar at only between 7 and 10 cents/kWh to California ratepayers**

# Installed PV Costs in US vs Germany

## Comparison of U.S. and German Solar Costs

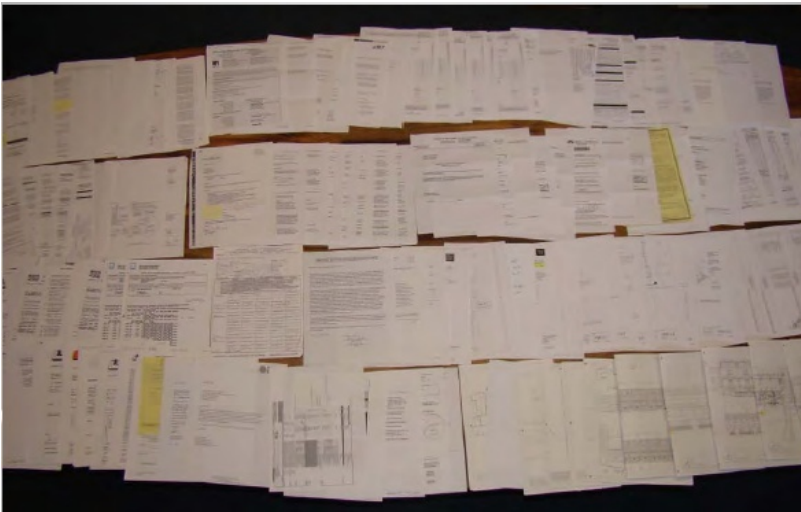


**Rooftop solar project installation costs are roughly 2.5 times higher in the US than in Germany**

Sources: LBNL, PwC, and Forbes; Sep2012

## CLEAN Programs remove barriers and reduce costs

Typical California paperwork for one project



Could be a 1kW-sized project, but maximum 1MW (via CSI program). Even more paperwork for California projects larger than 1MW (via RPS program).

Typical Germany paperwork for one project

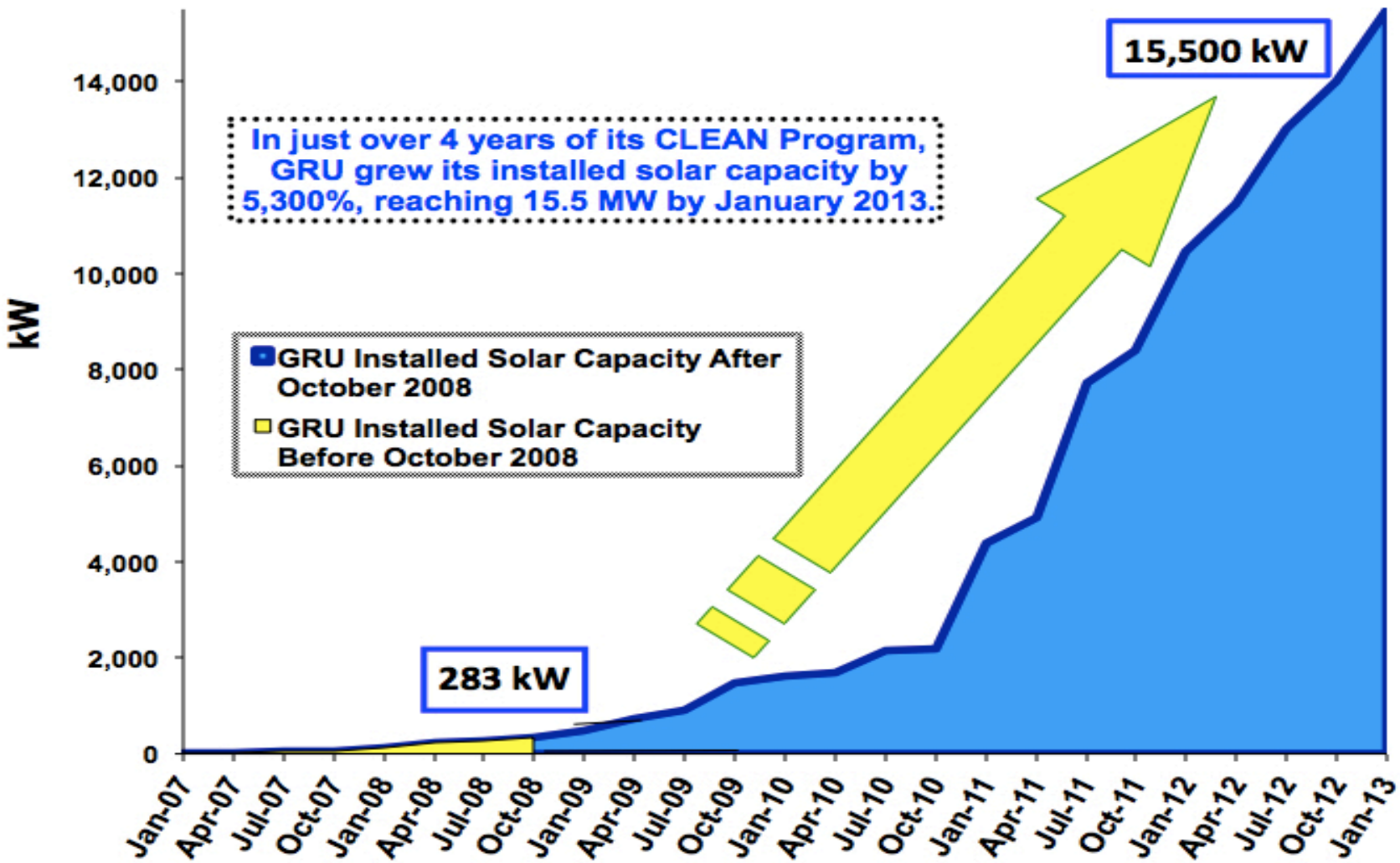


Could be a 1kW or 20MW-sized project, or bigger.

Source: Gary Gerber, President of CalSEIA and Sun Light & Power, Jun09

**CLEAN Programs reduce costs by removing bureaucracy**

## GRU Cumulative Installed Solar



- LADWP established a 150 MW CLEAN Program
- Mayor Eric Garcetti was elected to office campaigning for 1,200 MW of additional rooftop solar
- In the first week, 107 MWs of project applications were submitted for only 20 MWs of program capacity
  - Highlights a huge economic opportunity for more local solar in Southern California

## LADWP Feed-in Tariff Program Off to a Very Strong Start

Applications for 107 MW of Potential Local Solar Projects Received During Feed-in Tariff Program's Opening Week

**Los Angeles** – Eric Garcetti today said that as mayor he would power L.A. with a 1,200 megawatt solar rooftop program.

- ▶ LIPA's initial 50 MW program was so successful that they added 100 MW of program capacity, and they plan to create an additional 20 MW program for different renewable technologies
- ▶ The expanded program includes a 7c/kWh adder for projects sited in less stable parts of the grid

**LIPA To Add 100MW of Solar Power To Long Island**

**Clean Solar Initiative-II seeks 40MW on East End circuits to increase reliability**

"The expansion of *Clean Solar Initiative* is yet another signal that clean local energy benefits both consumers and utilities," said Craig Lewis, executive director of the Clean Coalition. "Furthermore, LIPA's recognition that distributed solar provides at least 7 cents per kilowatt-hour in avoided transmission and central generation costs makes clear to the rest of the country that the locational value of wholesale distributed generation is undeniable and significant."

- ▶ Georgia Power's Advanced Solar Initiative will bring 735 MW of solar capacity online in Georgia
- ▶ This is a great example of an investor-owned utility recognizing the value of distributed generation
  - ▶ The Georgia's all-Republican PSC shows renewables are increasingly attractive to fiscal conservatives looking to keep energy rates affordable.

**Environmentalists, Tea Party Patriots Win Solar Expansion at PSC**

**Georgia Votes For 525 MW Of New Solar Projects**

July 20, 2013

Nicholas Brown



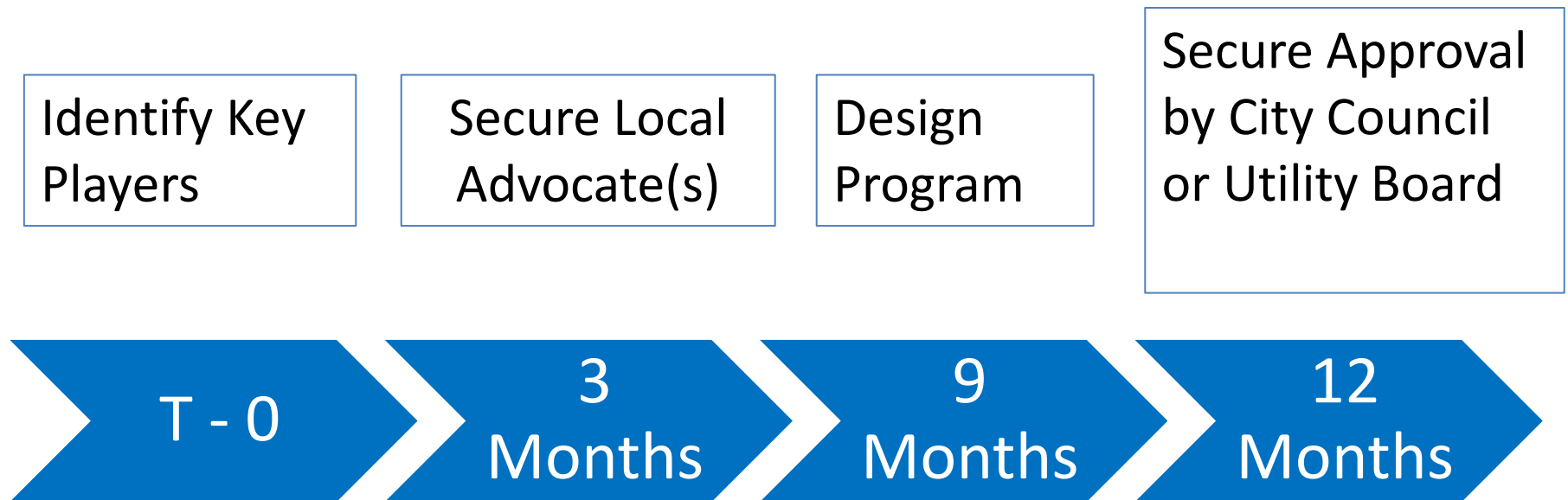
- ▶ **STEP 1: Evaluate the Utility Relationship**
  - ▶ Municipal Utility or Cooperative
  - ▶ Investor-owned Utility (IOU)
  - ▶ Community Choice Aggregation (CCA)

## ▶ **STEP 2: Establish Program Goals**

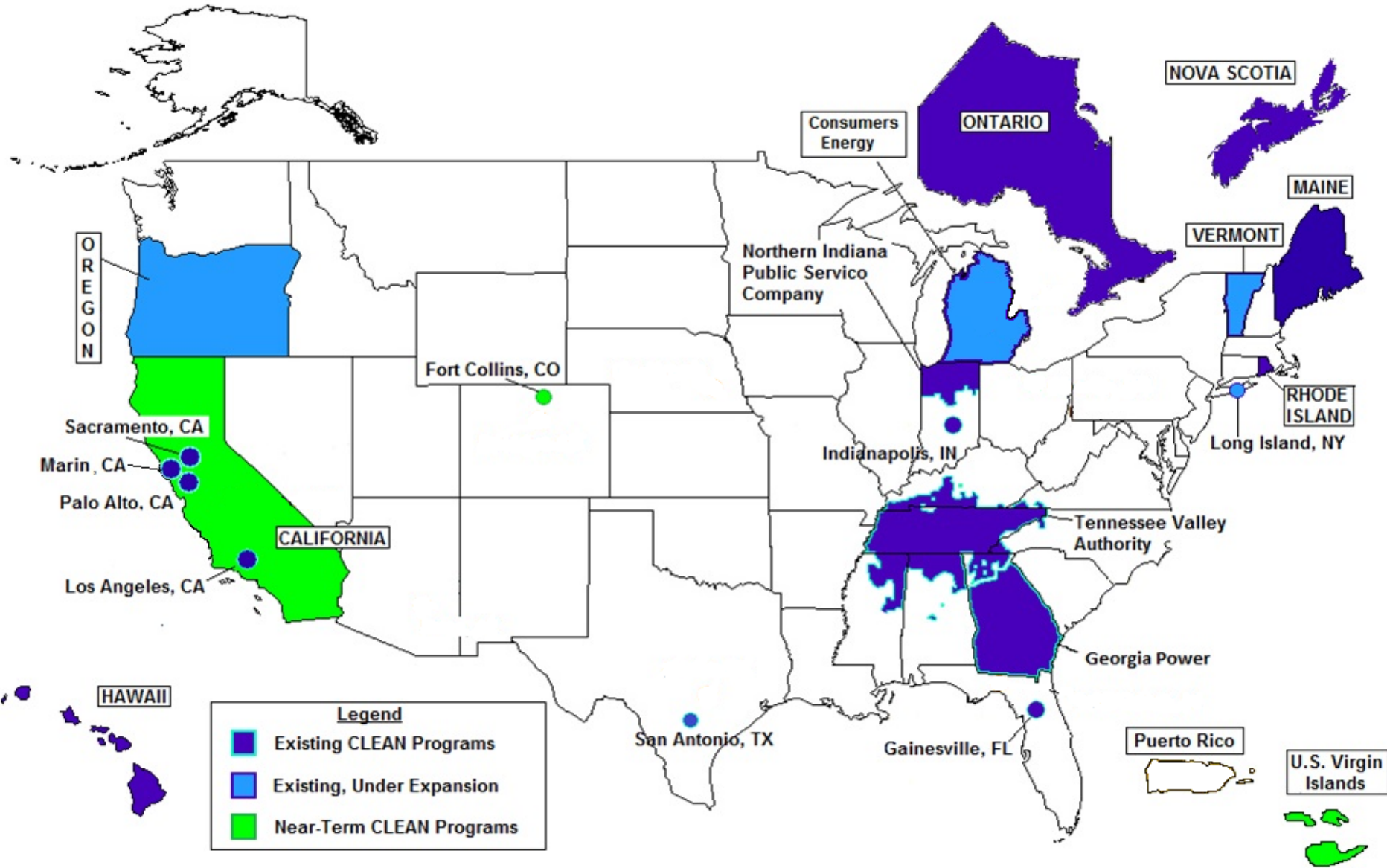
- ▶ CLEAN Programs are tailored to each jurisdiction based on the goals of their community
  - ▶ E.g., to encourage local private investment, the utility can limit participation to its customers and projects can only be sited within the service territory
  - ▶ Or, can create expedited permitting/review processes for projects sited in ideal locations

- ▶ Eligible Projects
- ▶ Contract Pricing and Program Sizing
- ▶ Streamlined and Transparent Access to the Distribution Grid
- ▶ Standard and Guaranteed Contract

This is the general timeline for the adoption of a CLEAN Program by a municipal utility.



# Existing CLEAN Programs in the U.S.



**“Coming together is a beginning,  
staying together is progress, and  
working together is success.”**

– Henry Ford

**“Alone we can do so little;  
together we can do so much.”**

– Helen Keller

**Free download:** <http://www.clean-coalition.org/local-action>

**Contact us:** [Gary@Clean-Coalition.org](mailto:Gary@Clean-Coalition.org)



**CLEAN**  **COALITION**  
Making Clean Local Energy Accessible Now

## Local CLEAN Program Guide

Module 1: Overview & Key Considerations



### Modules of the Guide:

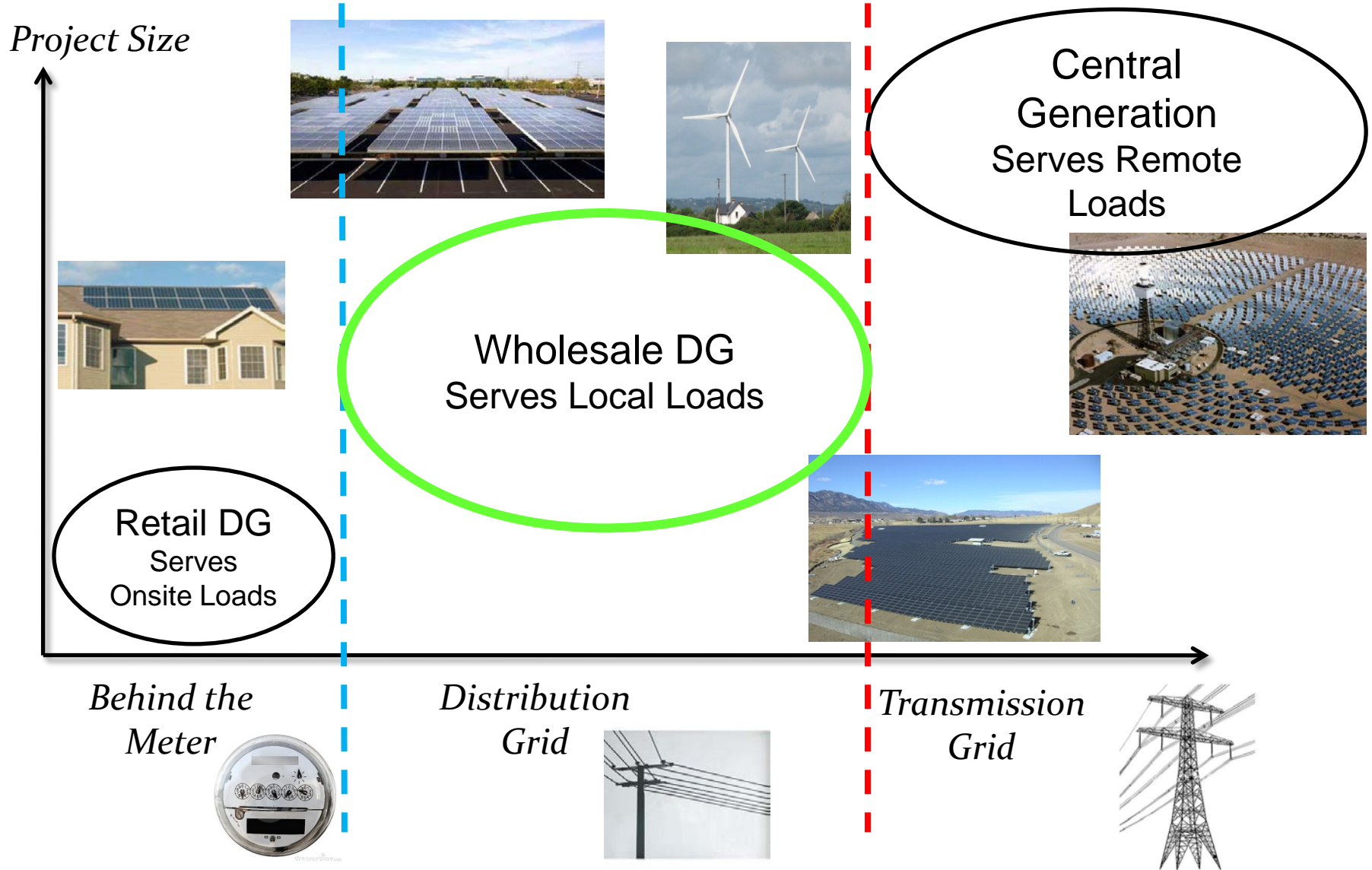
1. Overview & Key Considerations
2. Establishing CLEAN Contract Prices
3. Evaluating Avoided Costs
4. Determining Program Size & Cost Impact
5. Estimating CLEAN Economic Benefits
6. Designing CLEAN Policies & Procedures
7. Gaining Support for a CLEAN Program



# CLEAN Program Back-Up Slides



# Wholesale DG is the Critical & Missing Segment



CLEAN Programs (also known as feed-in tariffs) are the most effective policy solution for spurring renewable energy installations around the world

CLEAN Programs are responsible for **45% of all wind energy** and **75% of all solar PV capacity** installed in the world **before 2008**  
(National Renewable Energy Laboratory)

CLEAN Programs are responsible for **86% of the solar capacity** deployed in the world in **2009**  
(Meister Consultants Group)



- **Local Job Creation**

- CLEAN projects are local and “shovel-ready”
- Renewable energy creates far more jobs than fossil fuels or nuclear power (UC Berkeley)

- **Local Capital Investment**

- CLEAN Programs level the playing field, giving local residents and businesses the opportunity to reinvest capital in the community
- Local ownership of renewable energy increases the economic benefits to the community by 200% to 300% (US GAO)

- **Local Tax Revenues**

- Local job creation and capital investment in the community creates new sources of state and local tax revenues
- Does not rely on government subsidies



"Several aspects of the CLEAN Program have **proven to simplify and streamline the process.**



First, there is a **standard set of "bright line" rules** for a project to qualify, demanding no staff analysis or interpretations.

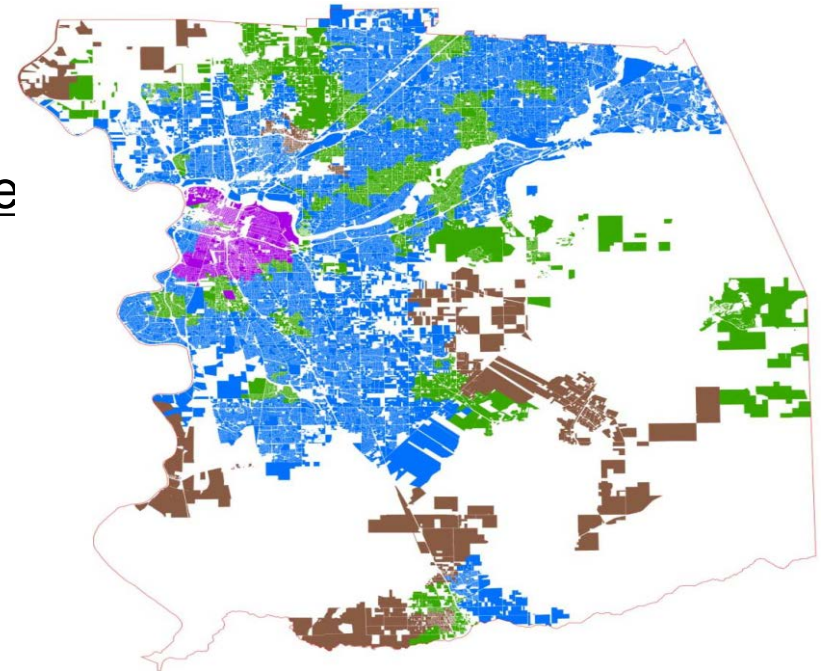
Second, there is a clear method for assigning capacity to qualifying projects... There is **no staff time wasted with evaluating RFPs...**

Third, each project... signs a **short, standard offer contract** and interconnection agreement.

There is **no valuable staff time wasted in negotiations and legal disputes.**"

## Sacramento Municipal Utility District (SMUD)

- ▶ 100 MW of WDG projects were built in 2 years with no ratepayer impact
- ▶ Equivalent to 2.5 GW of cost-neutral solar across California
- ▶ Maximized transparency by publishing online interconnection maps
- ▶ SMUD interconnection takes ¼ the time (6 months) compared to CA's IOUs
- ▶ Two SMUD staff members completed interconnection studies for 100 MW CLEAN Program projects in 2 months

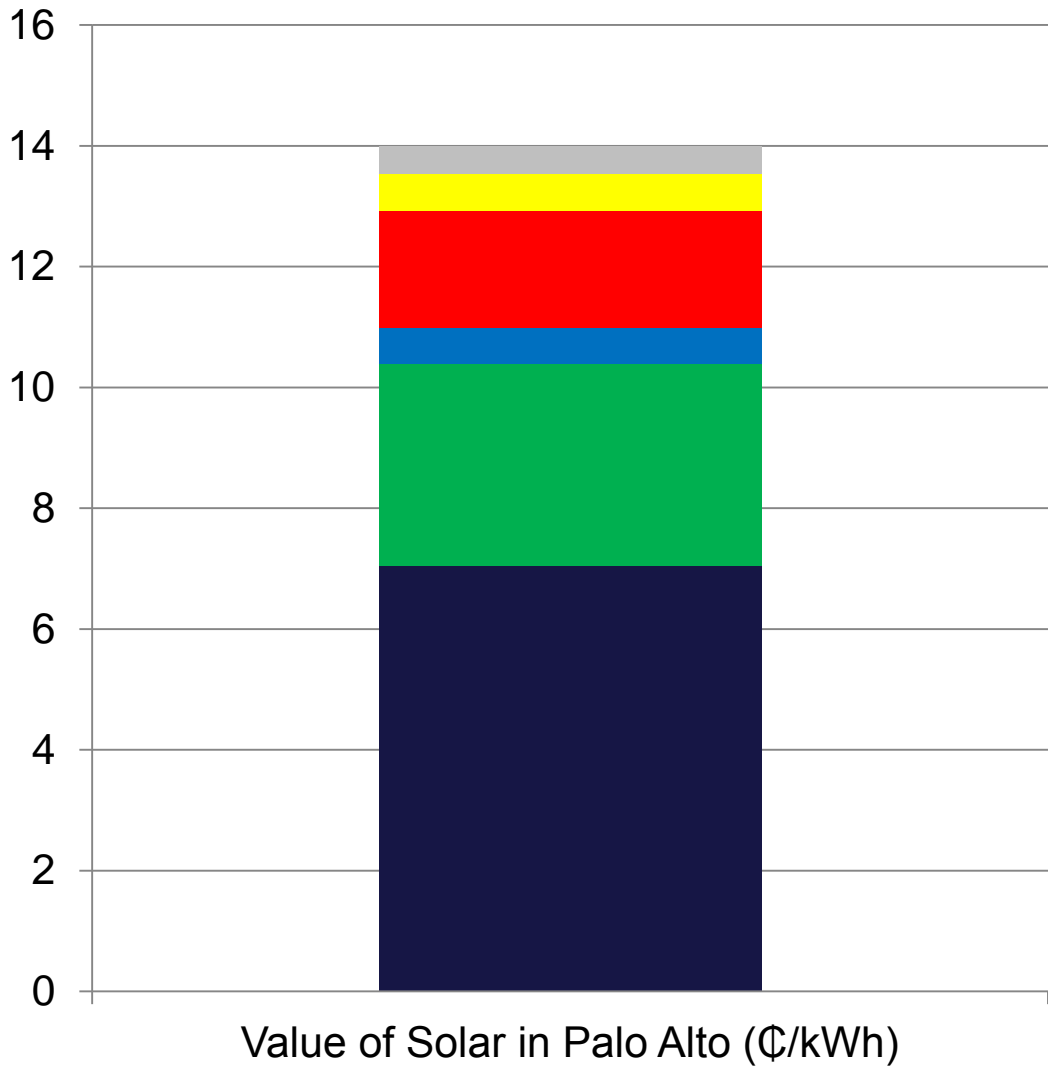


## Total Ratepayer Cost of Solar

	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	16¢	15¢	13¢	9-11¢	8-10¢	7-9¢
T&D costs	0¢	0¢	0¢	0¢	0¢	2-4¢
Ratepayer cost per kWh	16¢	15¢	13¢	9-11¢	8-10¢	9-13¢

Sources: CAISO, CEC, and Clean Coalition, Nov2012; see full original analysis from Jul2011 at [www.clean-coalition.org/studies](http://www.clean-coalition.org/studies)

The most cost-effective solar is large WDG, not central station due to significant hidden T&D costs

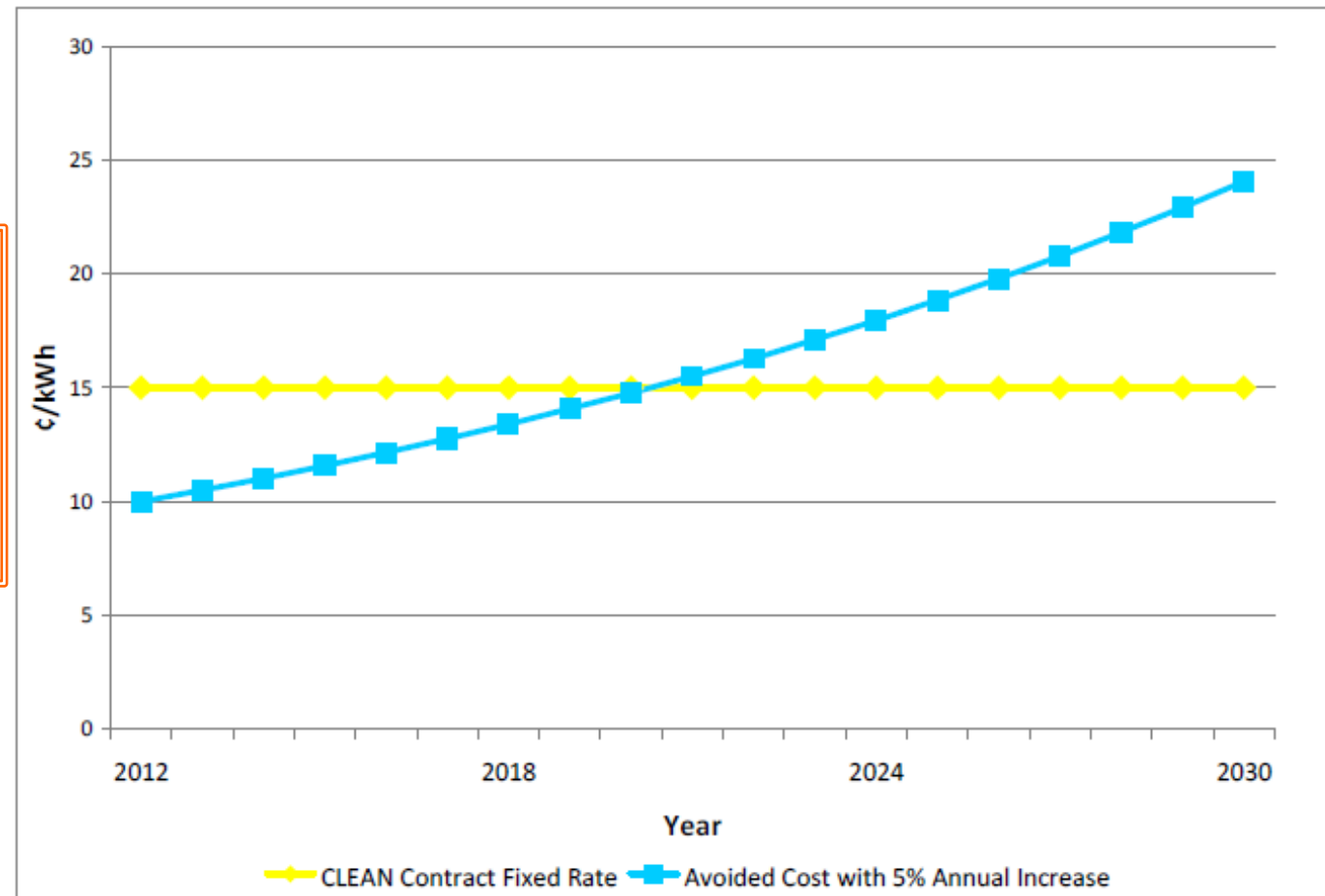


*“Palo Alto CLEAN will expand clean local energy production while only increasing the average utility bill by a penny per month” -- Yiaway Yeh, Mayor of Palo Alto*

- Premium
- T&D Losses
- Transmission
- Local Capacity
- RPS Value
- Base Energy

- Protects communities from rising fossil fuel costs over time even if it results in a small rate increase during initial years

For this 10 kW solar rooftop project in CO, avoided costs will rise above the CLEAN Contract price within a few years



Source: Clean Coalition, 2012



# Process for getting Palo Alto CLEAN (1 of 2)

1) Clean Coalition meets with individual City Council Members to discuss CLEAN policies and implementation.

3) CPAU staff draft & revise the Utilities Strategic Plan & Long-term Electric Acquisitions Plan, incorporating feedback from the UAC and community members.

4) Based on a Clean Coalition presentation and a presentation by City staff on the feasibility of a Palo Alto CLEAN Program, UAC Commissioners express support for moving forward with a CLEAN Program.

Spring  
2010

April-May  
2010

July 2010-  
Jan. 2011

February  
2011

2) Mayor, Vice Mayor, and two City Council Members send a memo to City Council requesting the full Council direct the UAC, supported by CPAU staff, to do a comprehensive review of the CPAU energy efficiency and renewable procurement strategy. City Council directs CPAU staff and the UAC to make recommendations to the Council for a comprehensive energy efficiency and renewables procurement strategy.



- ▶ Show Best Practices
  - ▶ Local CLEAN Program Guide
  - ▶ CLEAN Resource Hub
  - ▶ Respond to specific questions
- ▶ Run Basic Analyses
- ▶ Design policy and procedures
- ▶ Coordinate all relevant Departments to accelerate roll out
- ▶ Perform Stakeholder forums and coordination