CLEAN COALITION

Making Clean Local Energy Accessible Now

Planning for Distributed Renewable Energy

CLEAN Programs & The Role for Planners

Stephanie Wang
Director of Programs & Campaigns
Clean Coalition
Steph@Clean-Coalition.org
www.Clean-Coalition.org

Clean Coalition – Mission and Advisors

Mission

Accelerate the transition to cost-effective clean energy while delivering unparalleled economic benefits

Board of Advisors

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ED, Clean Economy Network

Josh Becker
General Partner, New Cycle Capital

Jeff Brothers
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Jim Weldon
CEO, Solar Junction

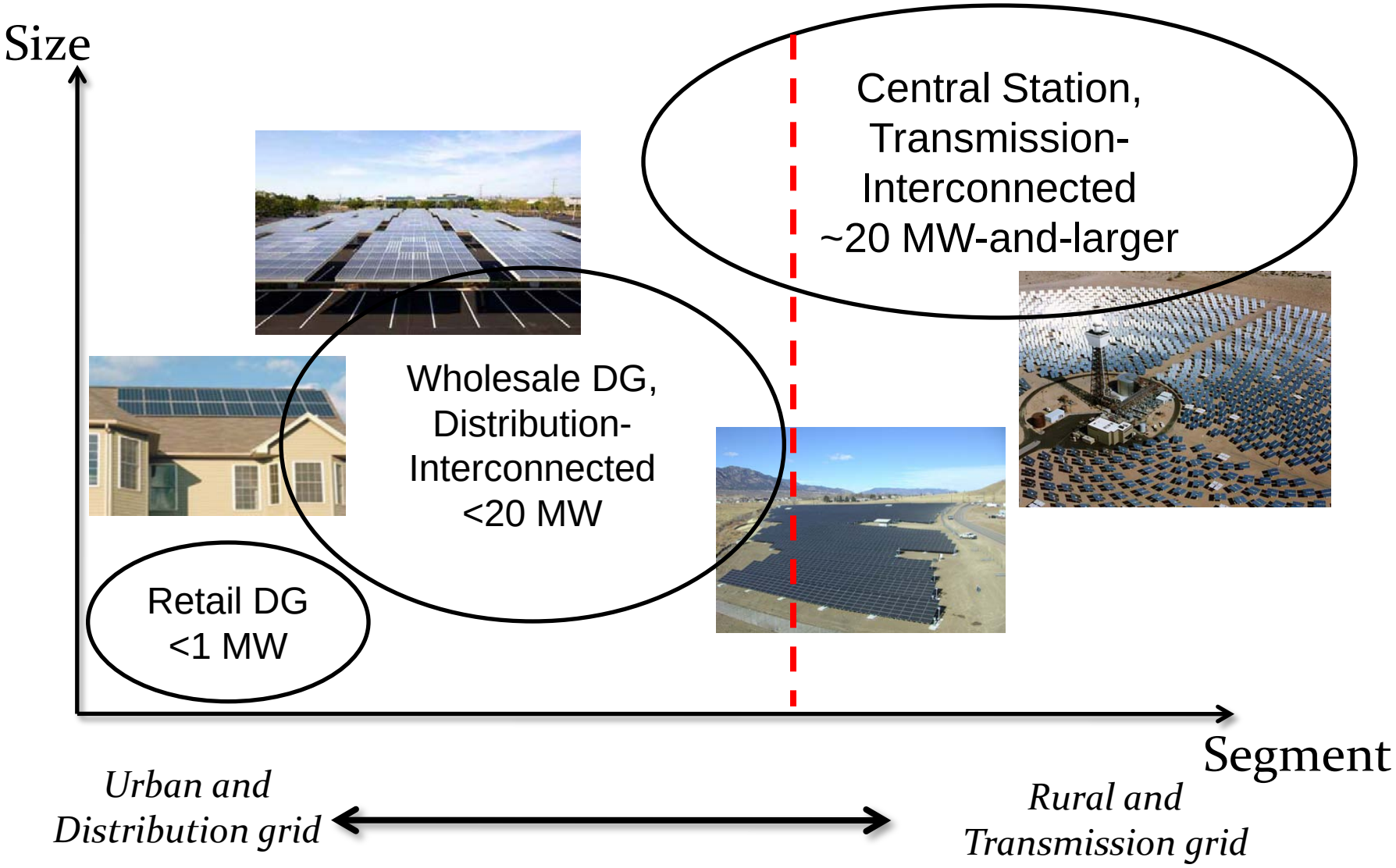
R. James Woolsey
Chairman, Woolsey Partners, and Former Director of the CIA

Kurt Yeager
ED, Galvin Electricity Initiative

Overview of Today's Presentation

- **Distributed Generation (DG)**
  - What is Wholesale DG?
  - Policy Gap for Wholesale DG
  - Superior Value of Wholesale DG
- **Policy Solution – CLEAN Programs**
  - What is a CLEAN Program?
  - CLEAN Benefits, Successes, Programs in the U.S.
  - Clean Coalition's Local CLEAN Program Guide + CLEAN California Campaign
- **Potential Roles for Planners**
  - Start the DG conversation instead of fixing permitting bottlenecks
  - Discussion

Wholesale Distributed Generation = Solution



U.S. Policy Gap for Wholesale DG

National policies focus on removing barriers for large-scale, remote renewable power facilities and infrastructure.

State and local **net-metering policies** promote small-scale renewables:

- Net-metering is designed to reduce a utility customer's electric bills
- Net-metering is not designed for owners of commercial and multi-tenant properties (where tenants pay the utility bills)
- Annual on-site energy use generally caps net-metering project size
- Investors and lenders find a utility customer's energy savings from net-metering far less attractive than a revenue stream from a stable utility

Superior Value of Wholesale DG Solar

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

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

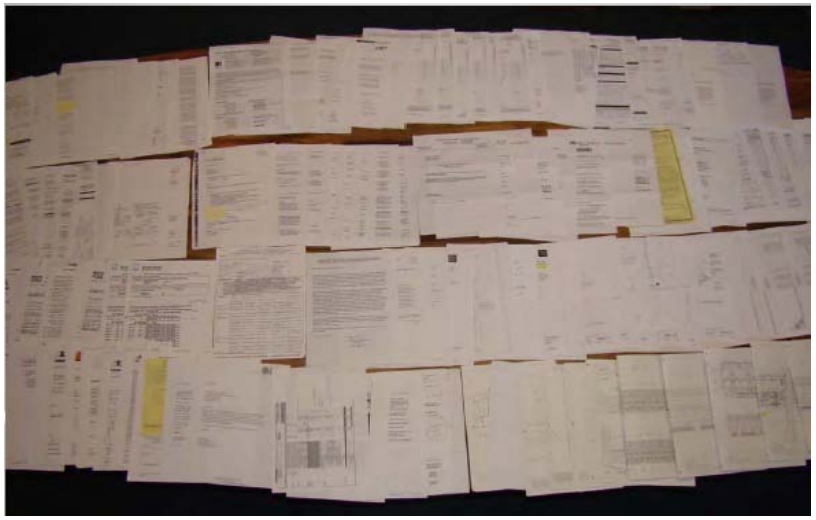
CLEAN Programs Defined

- CLEAN Features (Feed-in Tariffs + Grid Access)
  - Standard and guaranteed contract between the utility and a renewable energy facility owner
  - Predefined and financeable fixed rates for long durations
  - Predictable and streamlined distribution grid interconnection
- CLEAN Benefits
  - Removes the top three barriers to renewable energy
  - The vast majority of renewable energy deployed in the world has been driven by CLEAN Programs
  - Allows any party to become a clean energy entrepreneur
  - Attracts private capital, including vital new sources of equity
  - Drives local employment and generates tax revenue at no cost to government

CLEAN Programs are Simple and Transparent

CLEAN Programs remove barriers and reduce costs

Typical California paperwork for one project



Paperwork above is required for a single California Solar Initiative (CSI) projects sized between 1 kW and 1 MW.

Typical Germany paperwork for one project

Paperwork above covers all German CLEAN projects from 1kW to as large as 20MW.

.

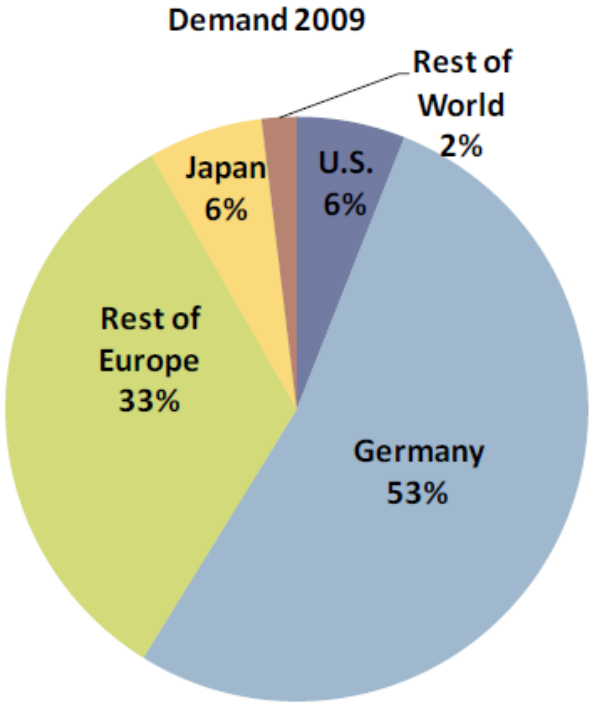
Source: Gary Gerber, President of CalSEIA and Sun Light & Power, June 2009

CLEAN Delivers Renewable Energy Goals

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
(Navigant Consulting, Meister Consultants Group)

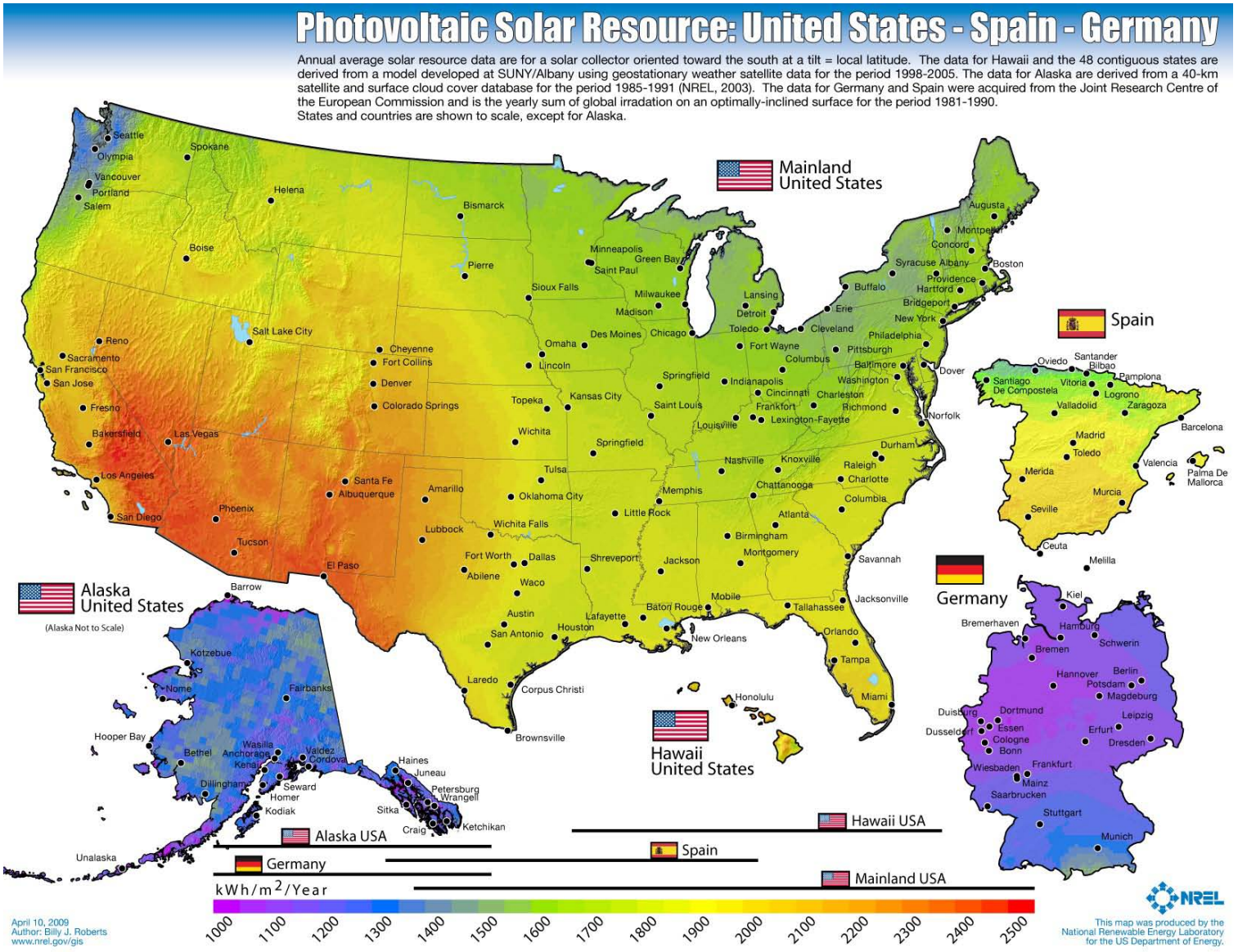


Source: Navigant Consulting

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

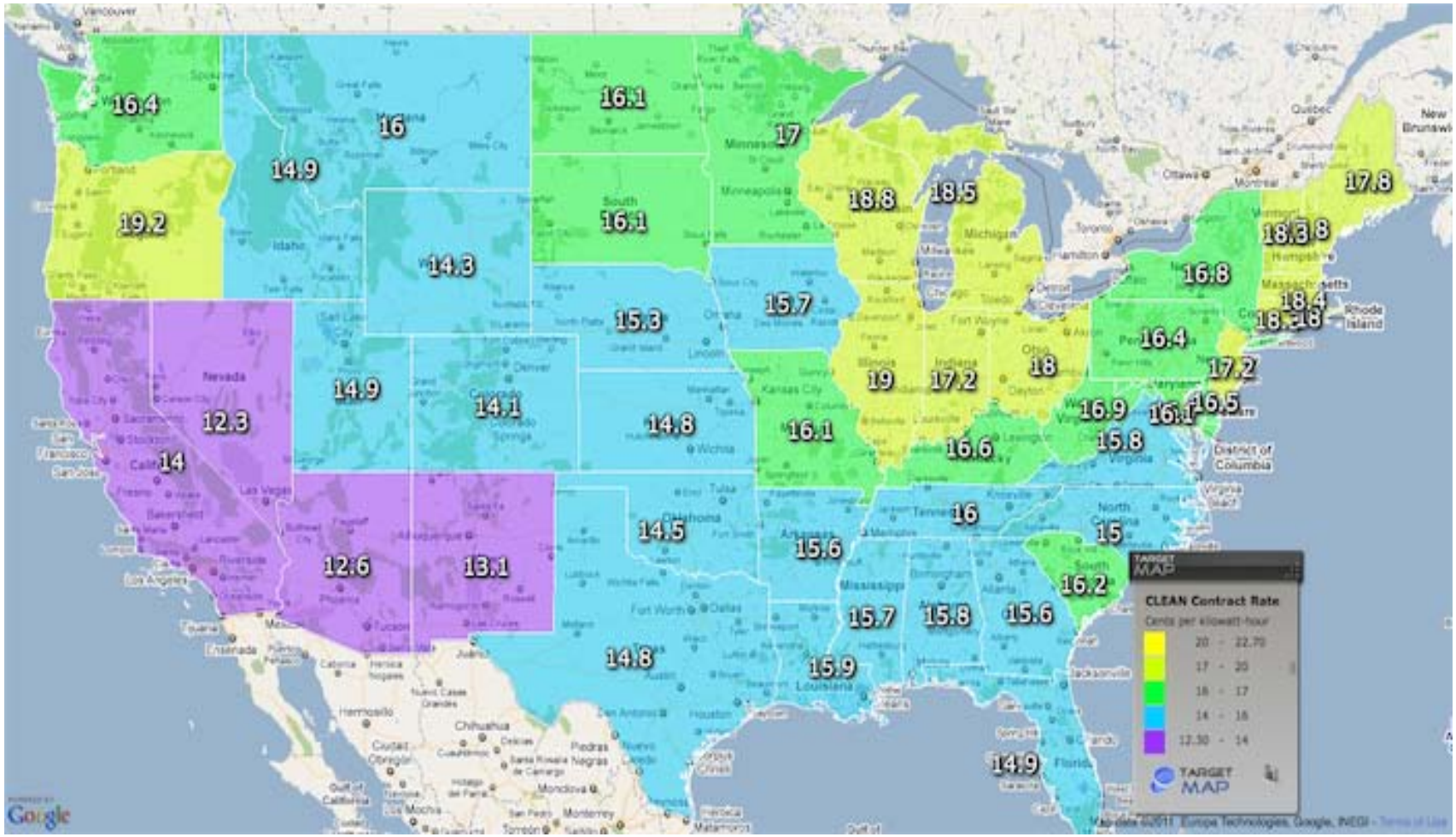
Sources: CPUC, CEC, SEIA and German equivalents.

Germany added 28 times more solar than California in 2010
even though California's solar resource is 70% better


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 irradation on an optimally-inclined surface for the period 1981-1990.
States and countries are shown to scale, except for Alaska.
Mainland United States
Alaska United States
(Alaska Not to Scale)
Hawaii United States
Spain
Germany
Seattle
Spokane
Olympia
Vancouver
Portland
Salem
Helena
Bismarck
Boise
Pierre
Minneapolis
Green Bay
Saint Paul
Sioux Falls
Milwaukee
Madison
Lansing
Detroit
Buffalo
Erie
Cleveland
Toledo
Chicago
Des Moines
Omaha
Lincoln
Fort Wayne
Pittsburgh
Philadelphia
New York
Bridgeport
Hartford
Providence
Boston
Syracuse
Albany
Concord
Montpelier
Augusta
Dover
Baltimore
Washington
Columbus
Indianapolis
Springfield
Cincinnati
Charleston
Frankfort
Richmond
Lexington-Fayette
Louisville
Saint Louis
Kansas City
Topeka
Wichita
Springfield
Norfolk
Durham
Raleigh
Charlotte
Nashville
Knoxville
Chattanooga
Columbia
Atlanta
Birmingham
Montgomery
Savannah
Jacksonville
Tallahassee
Orlando
Tampa
Miami
Mobile
Baton Rouge
New Orleans
Jackson
Shreveport
Lafayette
Houston
Austin
San Antonio
Waco
Abilene
Fort Worth
Dallas
Wichita Falls
Lubbock
Amarillo
Oklahoma City
Tulsa
Memphis
Little Rock
Santa Fe
Albuquerque
Phoenix
Tucson
El Paso
Laredo
Corpus Christi
Brownsville
Reno
Sacramento
San Francisco
San Jose
Fresno
Bakersfield
Las Vegas
Los Angeles
San Diego
Salt Lake City
Cheyenne
Fort Collins
Denver
Colorado Springs
Barrow
Kotzebue
Nome
Fairbanks
Hooper Bay
Bethel
Wasilla
Anchorage
Kenai
Valdez
Cordova
Dillingham
Seward
Homer
Kodiak
Haines
Juneau
Petersburg
Wrangell
Sitka
Craig
Ketchikan
Unalaska
Honolulu
Oviedo
Santander
Bilbao
Santiago De Compostela
Vitoria
Pamplona
Logrono
Valladolid
Zaragoza
Barcelona
Madrid
Toledo
Merida
Valencia
Palma De Mallorca
Murcia
Seville
Ceuta
Melilla
Kiel
Bremerhaven
Hamburg
Schwerin
Bremen
Hannover
Berlin
Potsdam
Magdeburg
Duisburg
Dortmund
Leipzig
Dusseldorf
Essen
Erfurt
Cologne
Dresden
Bonn
Wiesbaden
Frankfurt
Mainz
Saarbrucken
Stuttgart
Munich
Alaska USA
Hawaii USA
Germany
Spain
Mainland USA
kWh/m2/Year
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
April 10, 2009
Author: Billy J. Roberts
www.nrel.gov/gis
NREL
This map was produced by the National Renewable Energy Laboratory for the US Department of Energy.

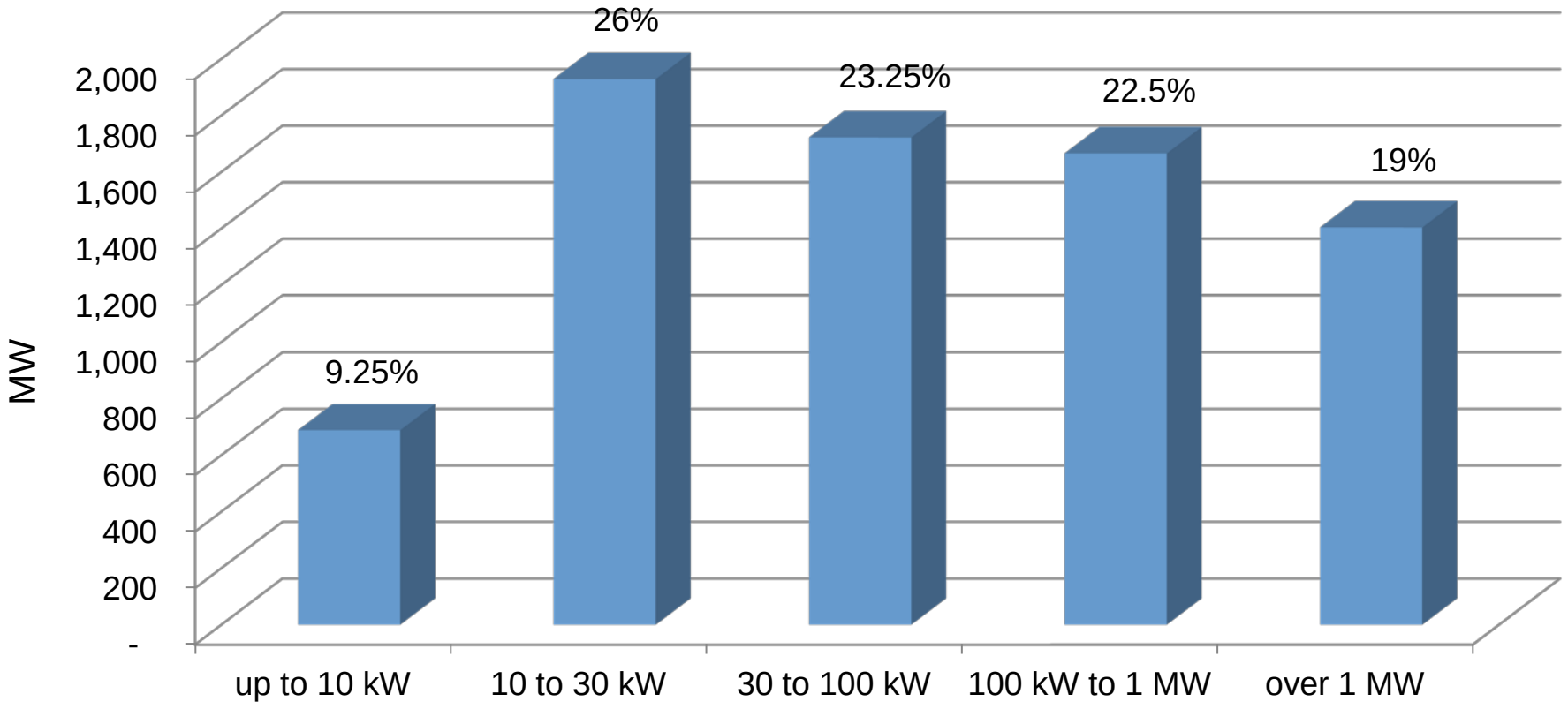
Germany Has Cheaper Solar Than the US

CLEAN Rates required for PV rooftop projects up to 30kW. Assumptions include $3.50/W installed cost (20% higher than in Germany) + use of U.S. federal tax credits



Source: John Farrell, ILSR, Jun2011: http://energyselfreliantstates.org/content/pricing-clean-contracts-feed-tariffs-solar-pv-us

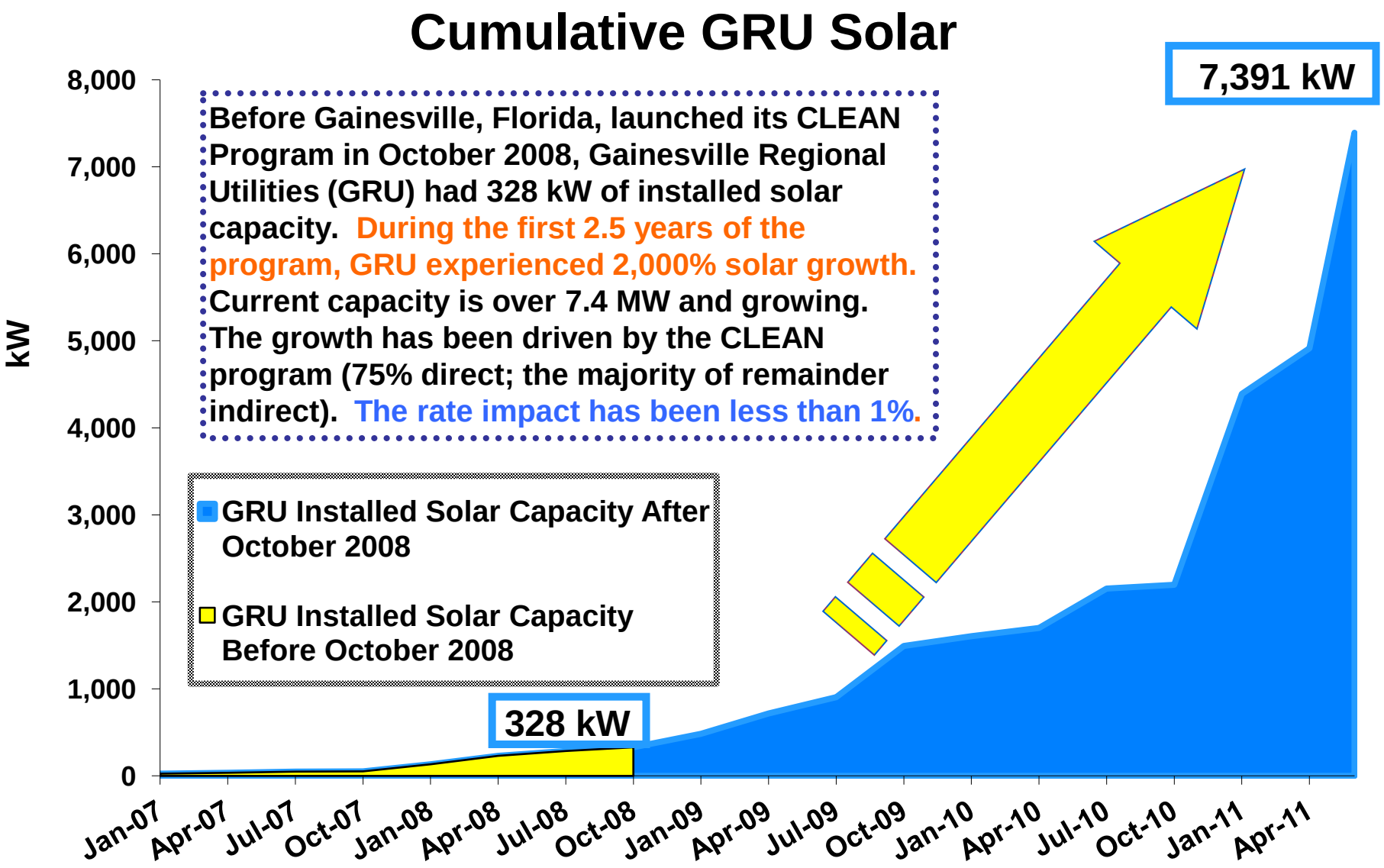
German Solar PV Capacity Installed in 2010



Germany's capacity is almost entirely small WDG (less than 2 MW projects) interconnected to the D-grid (not behind-the-meter)

Source: Paul Gipe, March 2011

Proven Success of CLEAN: Gainesville, Florida



CLEAN Maximizes Local Economic Benefits

CLEAN keeps energy dollars in the community:

- CLEAN Program for California vs. baseline reference case:
  3 times more jobs
  $50 billion additional private investment
  $1.7 billion additional state revenues

Source: UC Berkeley report
http://www.clean-coalition.org/economic-benefits-of-a-fit/

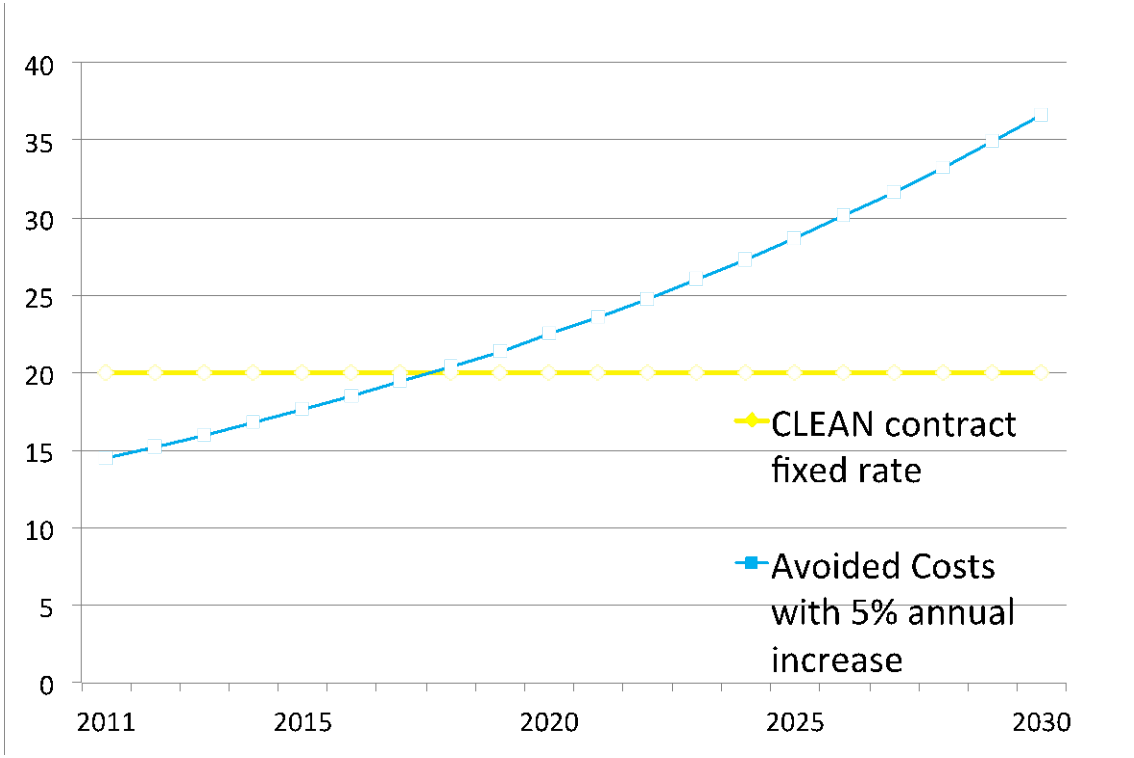
Low burden on the community and the utility:

- Does not rely on subsidies or other government expenditures
- Can be easily implemented and administered by utility staff

CLEAN Locks In Reasonable Electricity Rates

- May result in a small rate increase during initial years
  (e.g. Gainesville, Florida, achieved a 2,000% increase in deployed solar capacity with a rate increase of less than 1% during first 2.5 years of program)
- Protects communities from rising fossil fuel costs over time

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



Source: Clean Coalition

CLEAN Promotes National Security

- Grid Security:
  Increases electrical grid security and reliability by facilitating micro-grids (San Diego Blackout - Sept 8, 2011)

- Defense Supplies:
  Supports domestic private investment in developing and manufacturing mobile renewable technology for military use in the field

- Kick the Foreign Oil Habit:
  Spurs our transition to fueling cars with domestic electricity instead of foreign oil

CLEAN Promotes a Safer Energy Infrastructure

- Health:
  Promotes cleaner and safer energy generation

- Grid Security:
  Increases electrical grid security and reliability by facilitating micro-grids

  - Sept 2011 – Southwest blackout
    (transmission line failure – 7 million people lost power)

  - 2011 – Failure of 3 nuclear reactors in Japan

  - 2003 – U.S. Northeast blackout
    (transmission line failure - 50 million people lost power)

CLEAN Programs Ramping in the United States

- Local CLEAN Programs
  - Gainesville, FL (early 2009)
  - Sacramento, CA (early 2010)
  - San Antonio, TX (June 2010)
  - Los Angeles, CA (expected 2011)
  - Fort Collins, CO (expected 2011)
  - Palo Alto, CA (expected 2011)
  - Local CLEAN Program Guide (2011): www.Clean-Coalition.org/local-action

- State CLEAN Programs
  - Vermont enacted the first statewide program in mid-2009
  - Hawaii and Oregon enacted programs in 2010
  - Connecticut is moving Governor-sponsored CLEAN legislation
  - CLEAN California Campaign: www.EnergyJobsNow.org
  - State CLEAN Program Guide (2011)

Hybrid CLEAN Programs

A community with less control over its local utility can create a Hybrid CLEAN Program

- Control over wholesale electricity purchases, but no control of local electricity grid = CLEAN Contracts Program
- Control of retail electricity purchases only and no control over local electricity grid = CLEAN Retail Contracts Program
  - Standard Retail Power Purchase Agreements (Retail PPA)
  - In typical Retail Program, Project Developer agrees to:

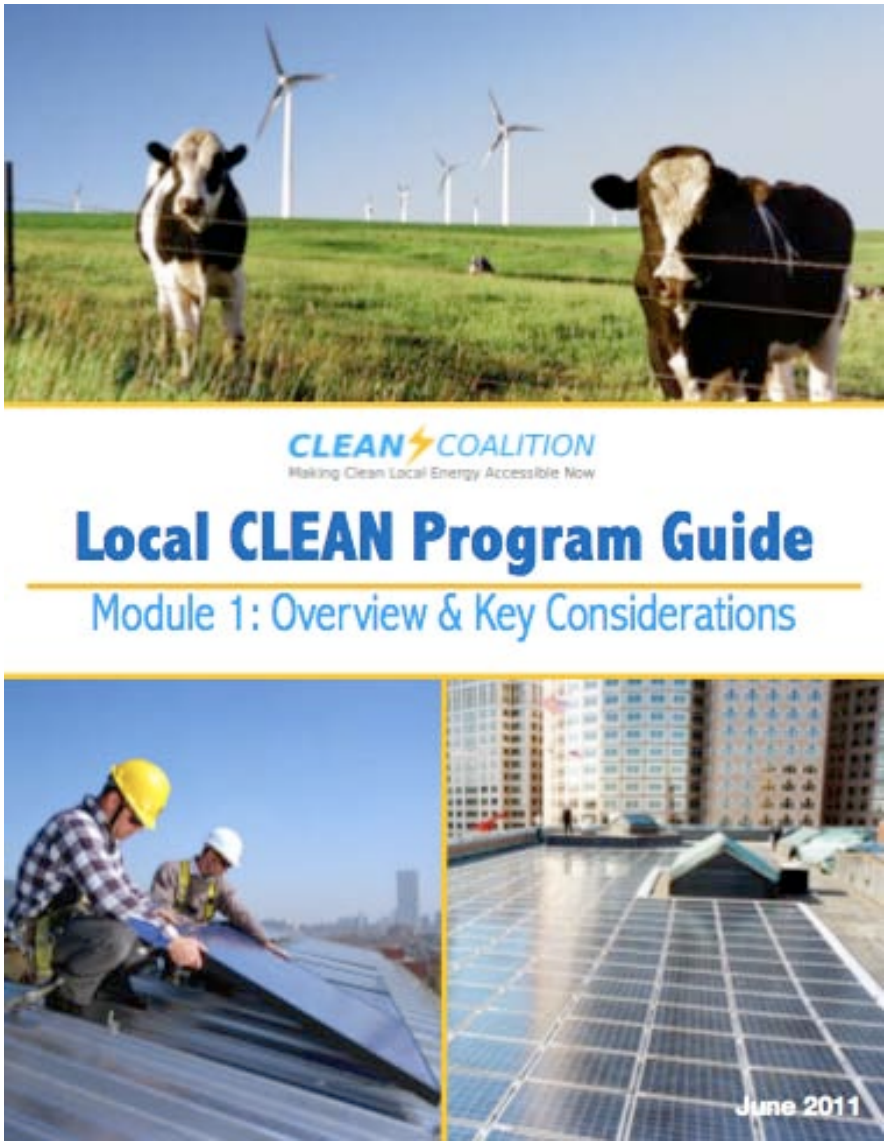
    i) Lease space on a designated property

    ii) Install and interconnect renewable facility "behind the meter" to serve onsite load

    iii) Sell the energy produced at predefined rates for a long duration

    iv) Maintain the facility over contract period

Making CLEAN Programs Easy



- Targeting communities and individual utilities with Local CLEAN Program Guide
- Targeting states with to-be-developed State CLEAN Program Guide
- Free download: www.Clean-Coalition.org/local-action

CLEAN California Campaign – Goals

- Meet Governor Brown's call for 12,000 MW of clean local energy by 2020
- Remove the top three barriers to renewable energy project development in our communities
  - Securing a contract to sell energy to the utility
  - Gaining access to the distribution grid
  - Attracting investors/lenders to fund the project
- Deliver the new energy economy now
  - **UC Berkeley report** by Dan Kammen compares CLEAN to baseline approach to achieving 33% RPS in California:
    Three times more jobs,
    $50 billion additional private investment, and
    $1.7 billion additional state tax revenues

CLEAN California Partners – Join Us

CLEAN COALITION

www.EnergyJobsNow.org

CLEAN COALITION
Making Clean Local Energy Accessible Now

LABC Los Angeles Business Council since 1936

RAEL
UC Berkeley

CALIFORNIA BUSINESS ALLIANCE FOR A GREEN ECONOMY

California Student Sustainability Coalition

CLEAN ECONOMY NETWORK

GALVIN ELECTRICITY INITIATIVE

ELLA BAKER CENTER for HUMAN RIGHTS

American biogas Council

U.S. GREEN BUILDING COUNCIL CHAPTER CALIFORNIA

DWEA DISTRIBUTED WIND ENERGY ASSOCIATION

CalCars THE CALIFORNIA CARS INITIATIVE

INTERTRIBAL COUP Council On Utility Policy
Building Sustainable Homeland Economies
P.O. Box 25, Rosebud, SD 57570
IntertribalCOUP.org

WINDUSTRY

ENERGY ACTION COALITION

CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANCE

groundswell

GLOBAL EXCHANGE

CALIFORNIA NATIVE PLANT SOCIETY

Discussion – The Role of Planners

- Roles of planners in general
  - Policy
  - Design
  - Community development
  - Housing and real estate

- Start the DG conversation instead of fixing permitting bottlenecks
  - Add DG & CLEAN to local plans and sustainability goals
  - Build awareness of CLEAN and the Local CLEAN Program Guide (e.g. newsletters, social media, webinars, conferences)

- Discussion

Back-up Slides

- Most expensive German CLEAN rate is set for solar
- Germany's weighted average solar rate is about US$0.30/kWh
- In Colorado, the equivalent rate would be less than $0.12/kWh
  - Tax credits in US reduce the German rate by 40%
    - Investment Tax Credit (ITC) and Accelerated Depreciation
  - Solar resource is at least 50% better in Colorado, which reduces German rate by more than an additional one-third
- Effectively: 30 cents/kWh goes to 18 and then to less than 12

German PV rate of 30 cents is equivalent to less than 12 cents in Colorado

CLEAN Boosts Wholesale Distributed Generation

CLEAN Programs provide **Transparency, Longevity & Certainty (TLC)*** to the wholesale distributed generation market by removing the main barriers to the sale of clean local energy to utilities for local use.

Procurement

- **Barrier**: Securing a contract to sell renewable energy involves high transaction costs and risks
- **Solution**: Standardized contract terms and rates for long duration

Grid Access

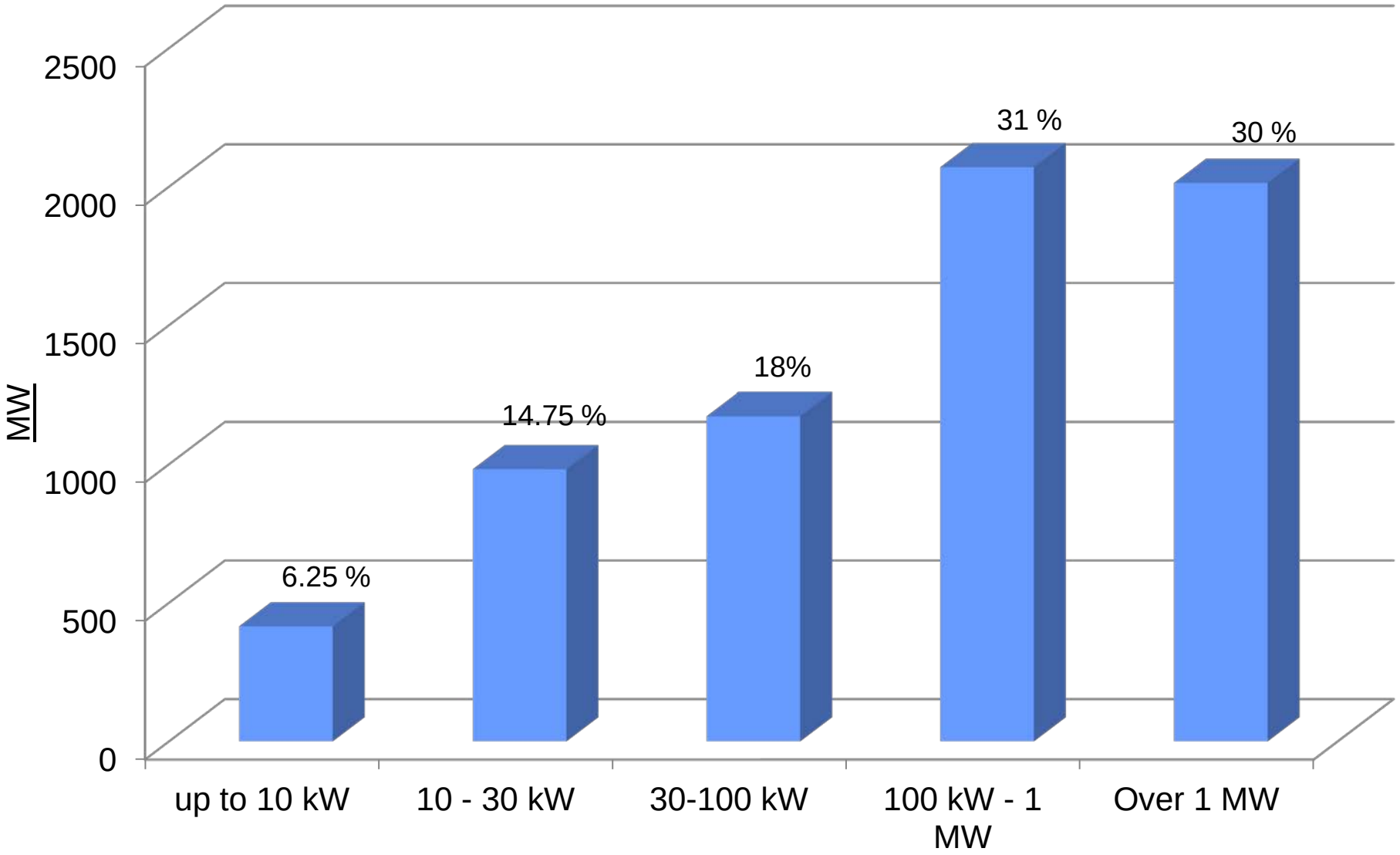
- **Barrier**: Gaining access to the distribution grid is risky, expensive, and time-consuming
- **Solution**: Transparent and streamlined distribution grid interconnection process

Financing

- **Barrier**: Risk associated with other noted barriers and lack of secure financial basis to attract investors and lenders
- **Solution**: Predictable cash flow stream from a low credit-risk source (the utility)

** See Deutsche Bank Climate Change Advisors report at http://www.dbcca.com/dbcca/EN/_media/German_FIT_for_PV.pdf*

Gainesville CLEAN Solar Capacity Distribution



Source: Gainesville Regional Utilities, August 2011

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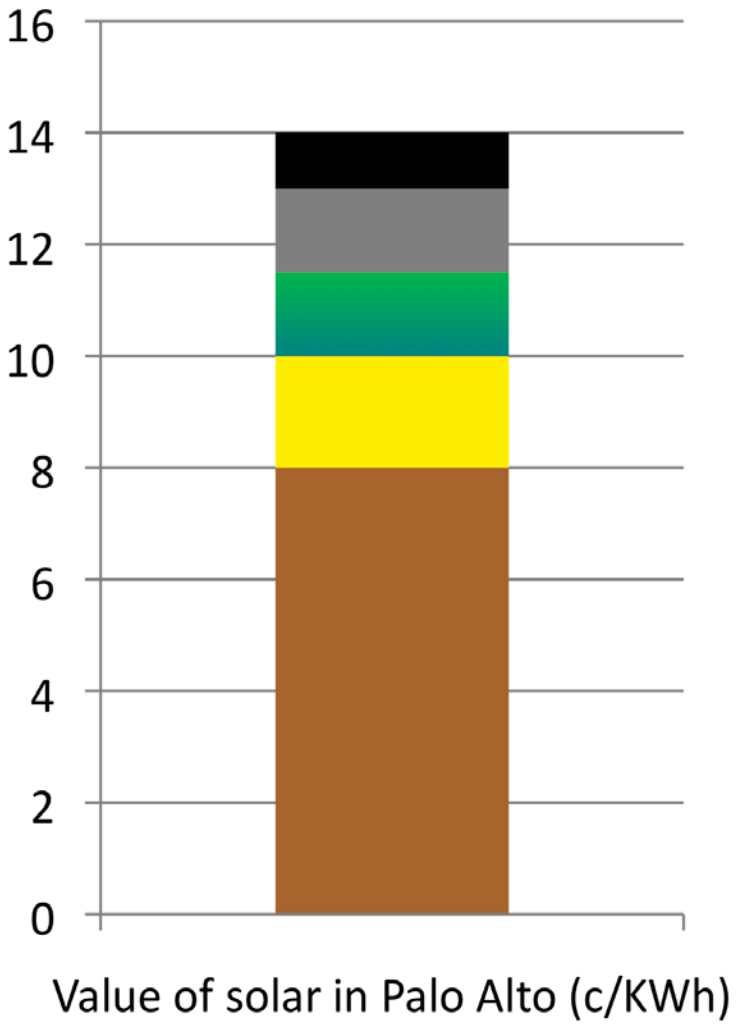
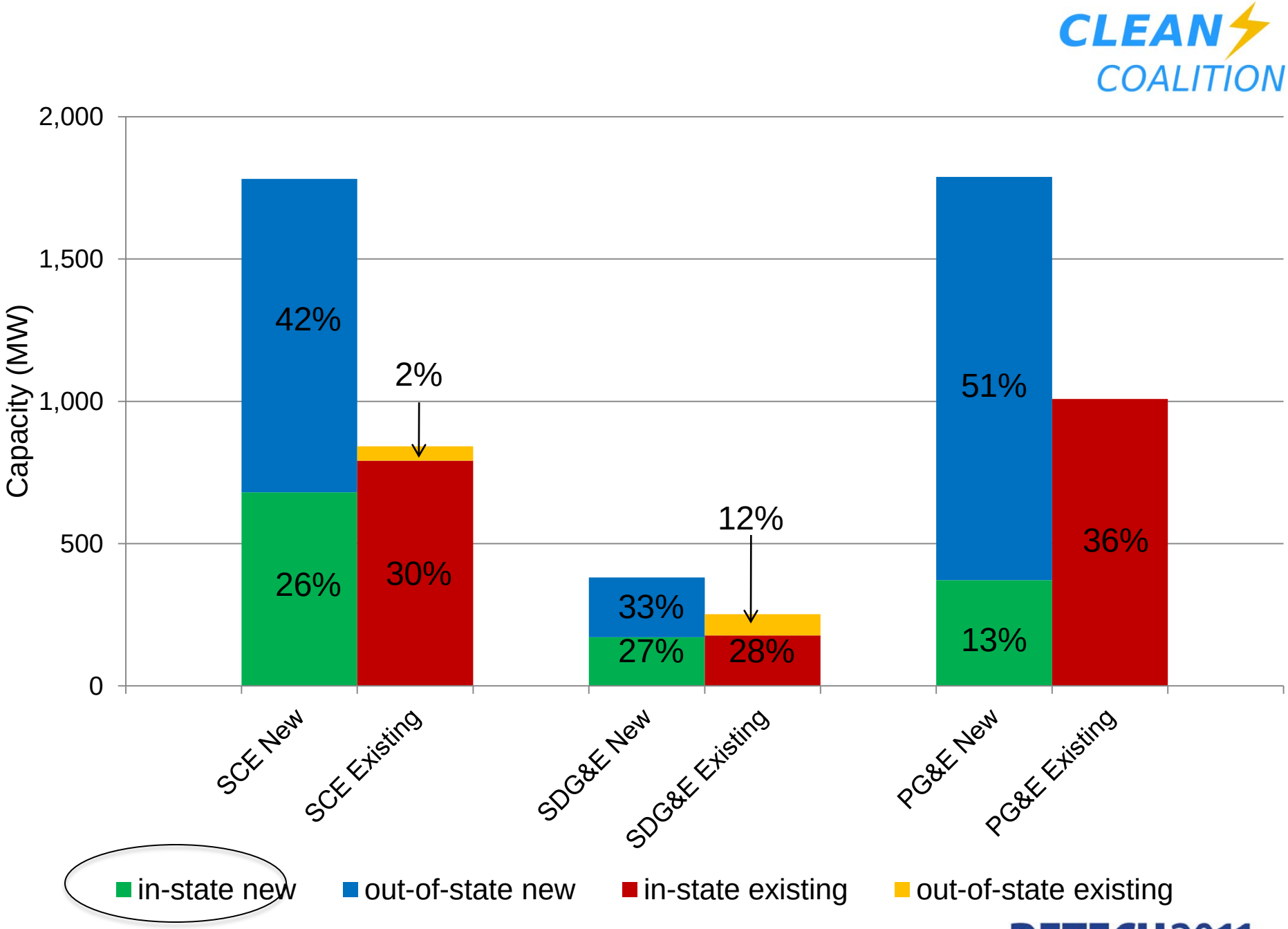
CLEAN Avoids Hidden Transmission Costs



- 1 - Additional local value
- 1.5 - Avoided Transmission Access Charges (TACs)
- 1.5 - Renewable Energy Credits (RECs)
- 2 - Time-of-Delivery
- 8 - Brown energy cost


2,000
1,500
1,000
500
0
Capacity (MW)
42%
26%
2%
30%
33%
27%
12%
28%
51%
13%
36%
SCE New
SCE Existing
SDG&E New
SDG&E Existing
PG&E New
PG&E Existing
in-state new
out-of-state new
in-state existing
out-of-state existing

California Programs – SB32 and RAM

- Overall Context: 33% RPS law signed in April 2011
  - Governor's Target of 12,000 MW of DG
- SB32 - CA CLEAN law passed in 2009
  - Previous AB1969 FIT produced very little
  - Projects up to 3 MW, Program cap at 750 MW
  - New Pricing Models – first test of FERC Declaratory Order
  - Operational program: Q2 2012
- Renewable Auction Mechanism (RAM)
  - Each of the three major IOUs will hold an auction by Nov 15
  - Projects 1-20 MW, Program cap at 1 GW
  - Does not have advantages of CLEAN programs. Expected results:
    - Dominated by large companies, large projects – very little actual DG
    - High failure rate

Interconnection Reform

- Interconnection desperately needs reform
  - Confusing mix of tariffs, jurisdiction, rules
  - Unpredictable timelines, costs : expected average of 2+ years
  - Missing key policy requirements: Transparency and Certainty
- Wholesale Distribution Access Tariff (WDAT)
  - Federal jurisdiction – “reformed” in early 2011
  - Needs data transparency and accountability to the rules
- Rule 21
  - Initially targed at behind-the-meter DG, used as a model nationwide
  - Major reform needed to handle large volumes of Wholesale DG
  - “Quick”, Phase 1 reform targeted for Q1 2012

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