

The Value of Distributed Renewable Energy Generation

Presentation for Indiana Sustainable Energy Coalition

14 September 2016

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About Pace & NESEMC

- Pace Energy and Climate Center is a “think and do” tank that has advanced clean energy policy and development in NY and the Northeast for 27 years.
- The Northeast Solar Energy Market Coalition is a coalition of solar energy business associations in the 9 Northeast states seeking to harmonize solar market policy in order to grow solar markets.

The Big Picture

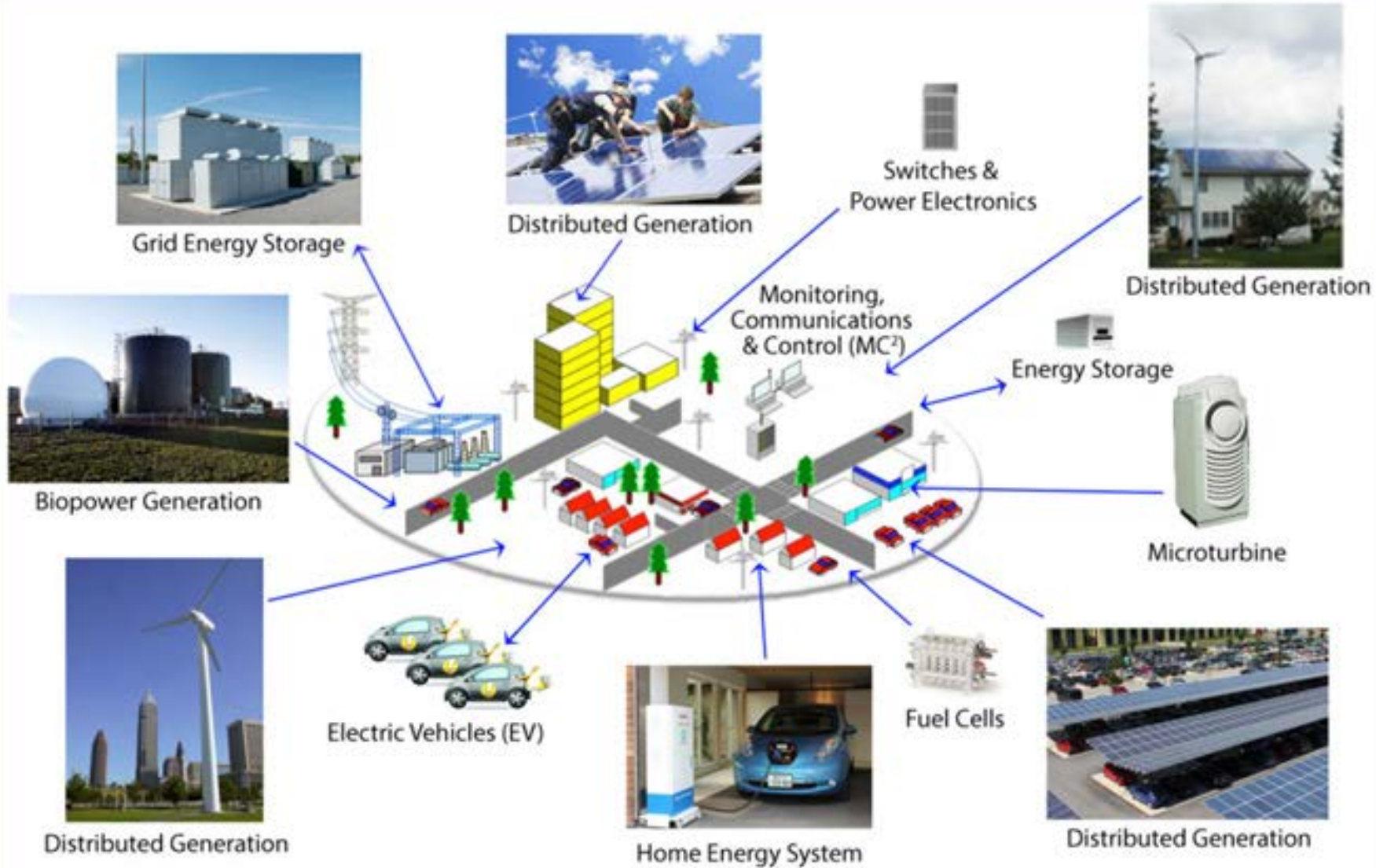
- A Clean Energy Future is an Economic and Environmental Necessity.
- A Transition to a Clean Energy Future is (Like Any Transition) a Function of Economics and Markets, Technology, and Policy.
- *Advocates Have a Major Role to Play in Framing the Policy Debate, and Policy Should be Framed in the Language of Economics, Markets, and Technology.*
- Policy, Like Politics, is Local.

The Policy Context

- Utilities are Beginning to Embrace Solar.
- ITC and PTC are Finance, Not Really Local Policy.
- The Clean Power Plan Will Set a Floor.
- RPS and NEM are Solid Policy in Low-Renewables States, for Now.
- Customer-Owned Solar Builds Businesses, Jobs, and Political Support.
- There is No Utility Death Spiral Unless Utilities Ignore the Forces of Change.
- Now is the Time to Plan for the Markets That Must Ultimately Finish the Job of Transitioning to a Clean Energy Future.

Policy Drivers for Distributed Renewable Generation

- Substantial private investment benefits the entire grid
- Customer-generators & 3d-Party financiers assume operational & insurance risk
- Technology innovation
- Environmental justice benefits
- More jobs per unit of generation capacity
- Local economic development & tax base benefits
- Integrates well with microgrids to deliver resilience benefits
- Challenges utilities to modernize



(Source: The Clean Coalition)

Cost of Service Ratemaking and Fair Credit for the Value of Distributed Resources

- Properly set utility retail rates are supposed to capture all the costs of making and delivering electricity to the customer.
- Distributed resources do all the work of utility-delivered electricity, and:
 - Saved/generated near where it is used;
 - Financed, operated, insured by the customer;
 - Drought-proof and carbon proof;
 - Price stable; and
 - Excess serves/supports customer loads nearby.

Net Energy Metering – “NEM”

- NEM customers fully charged for gross consumption.
- NEM does not allow the customer to “avoid” distribution charges, only “offset.”
- Valuation studies in AZ, CA, CO, CT, MA, ME, MN, MS, NC, NH, NY, NV, RI, TX, UT, VT, WI show that NEM at full retail results in solar customers subsidizing the utility and non-solar customers.
- It is illogical to assert that NEM creates a subsidy without a full cost-of-service or valuation study.
- So the real question – what is the fair offset rate for distributed solar generation?

Net Metering

$$\text{NEM Bill} = (\text{GC} - \text{GP}) \times \text{Rate}^{\text{R}}$$

or $(\text{GC} \times \text{Rate}^{\text{R}}) - (\text{GP} \times \text{Rate}^{\text{R}})$

where: GC = Gross Consumption

GP = Gross Production

Rate^R = Retail Rate

(in some places, different for offset vs. excess production)

$$\text{VOS Tariff} = (\text{GC} \times \text{Rate}^{\text{R}}) - (\text{GP} \times \text{Rate}^{\text{VOS}})$$

Rate^{VOS} = Value-based Rate

Ideal Rates for Distributed Resources

*The First and Most Important Thing
is to Get the Prices Right!*

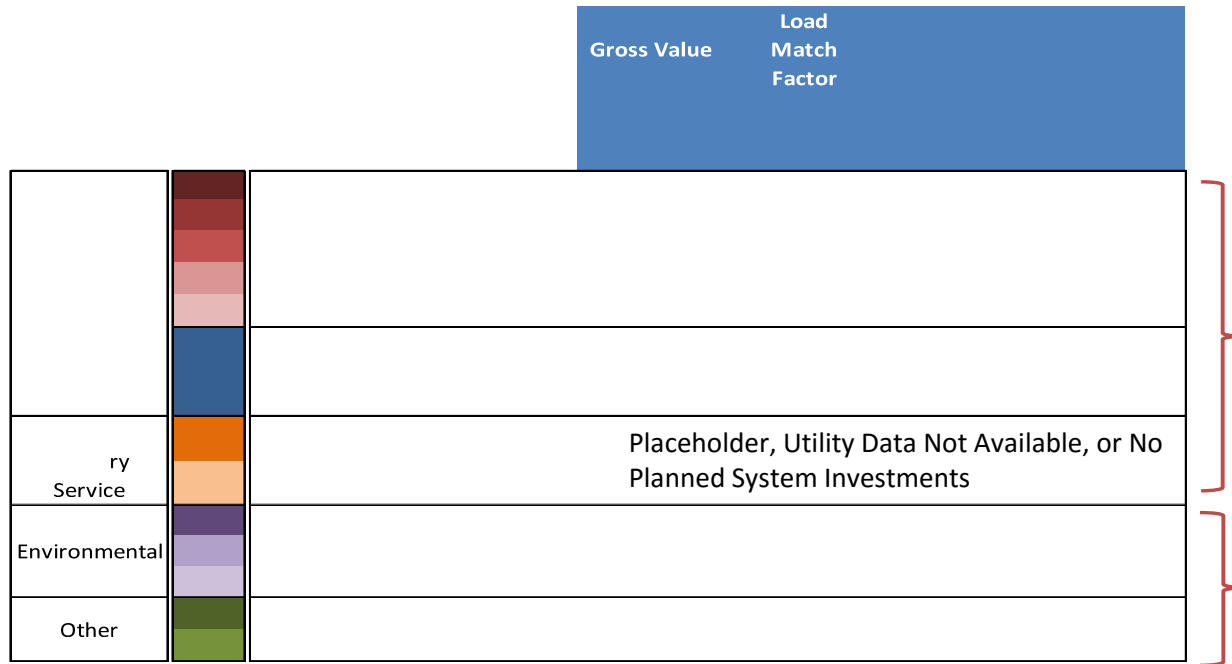
- Fair to the utility and non-participating customers
- Fair compensation to the participating customer for value created
- Decouple compensation from incentives - credit for value is just fair, incentives are for correcting market failures
- Align public policy goals (decouple compensation from consumption – stop rewarding just throughput)
- Intuitively sound and administratively simple

Values of Distributed Energy Generation

- Energy (volume of electricity)
- Capacity (size of plants, cables, transformers)
- Avoided transmission & distribution costs (reduce need & extend life)
- Avoided pipeline costs
- Reduced line losses (can be 6% - 9%)
- Reduced market prices for everyone
- Price stability over time
- Reduced RPS costs
- Reduced risk of environmental compliance costs
- Avoided residual environmental damages
- Ancillary service (e.g., voltage regulation)

Maine Value of Solar Study

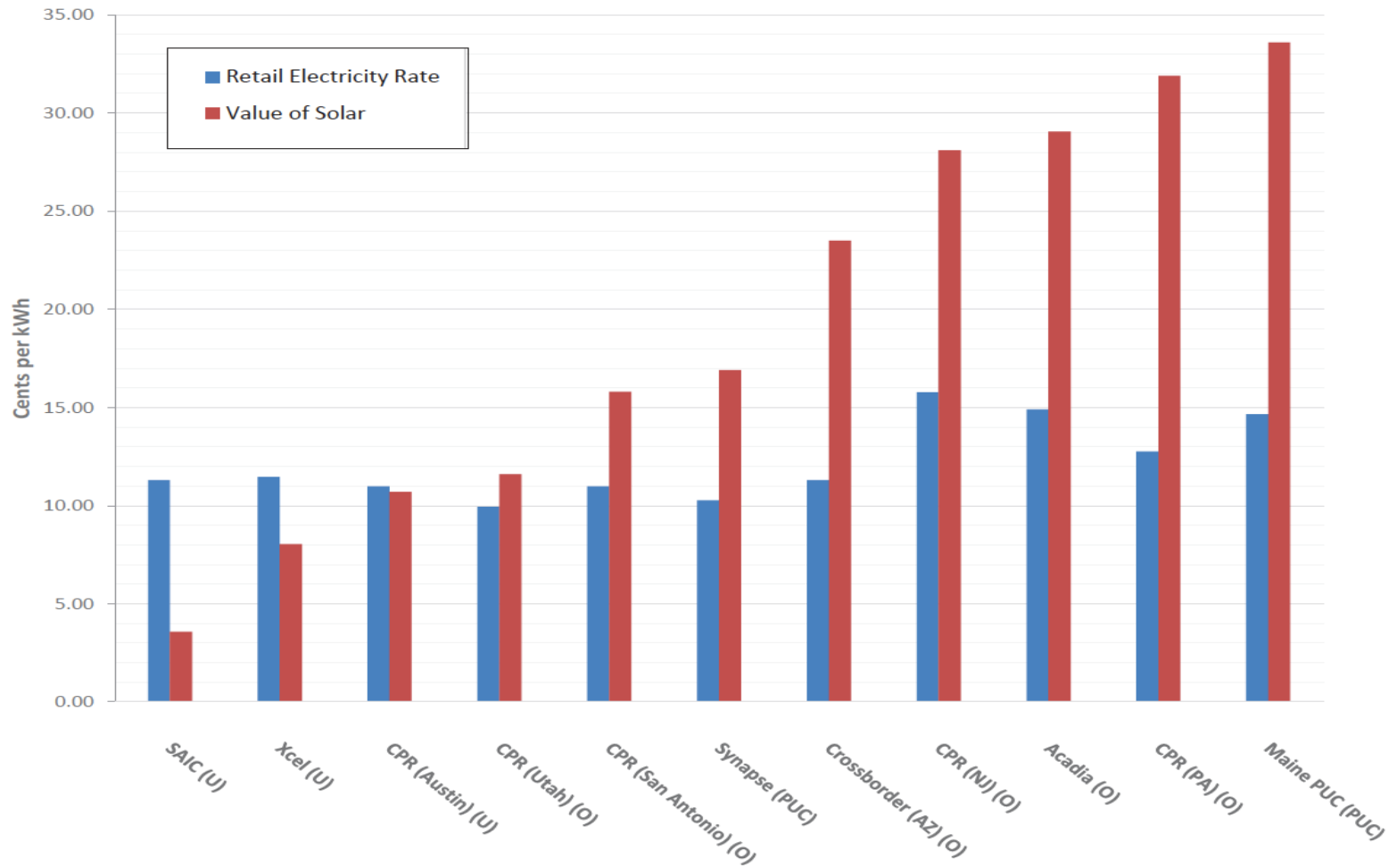
Figure ES- 2. CMP Distributed Value – 25 Year Levelized (\$ per kWh)



Gross Values represent the value of perfectly dispatchable, centralized resources. These are adjusted using

- Load Match Factors to account for the non-dispatchability of solar; and
- Loss Savings Factors to account for the benefit of avoiding energy losses in the transmission and distribution systems.

Figure ES-1: Retail Electricity Rates and the Values of Solar Energy in 11 Cost-Benefit Analyses.



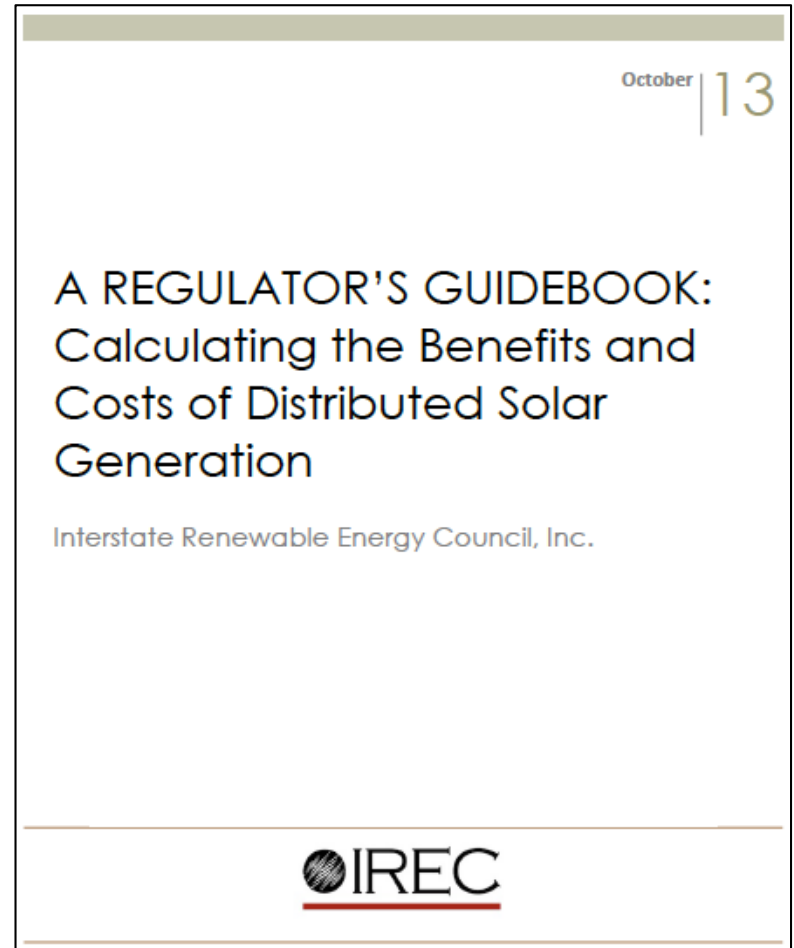
(U)—Studies written by, or commissioned by, utilities
(PUC)—Studies written by, or commissioned by, public utilities commissions
(O)—Studies written by, or commissioned by, non-utility organizations

Source: Environment America, “Shining Rewards,” Jun 24, 2015
<http://www.environmentamerica.org/reports/amc/shining-rewards>

Distributed Solar Valuation: “A Regulator’s Guidebook”

Available from:

<http://irecusa.org>



PV Valuation Methodology

Recommendations for Regulated Utilities in Iowa



February 26, 2016

Prepared for:

Midwest Renewable Energy Association

Prepared by:

Ben Norris, Clean Power Research

<http://www.growsolar.org/wp-content/uploads/2016/03/PV-Valuation-in-Iowa.pdf>

Public Support

80% of respondents say that policy-makers should encourage, through **subsidies**, those who install solar panels

69% said it would be fine for solar customers to **pay nothing to the utility each month** if they produced enough electricity to cover their own needs in aggregate

82% said that solar customers should be compensated **at or above retail** for the kilowatt-hours their systems produced



So ...

Any changes that could be perceived as reducing support for the expansion of solar power are likely to be seen in a negative light by over three-fourths of the population, not just by intervenors and lobbyists.

Source: B. LeBlanc, "Net Metering Wars: What Do Customers Think?," E Source 2016

Utility Reactions to Distributed Resources

- Cost-plus business model vulnerable to private investments by customer-generators – lost profits. (Even with decoupling, reduces capital investments.)
- At much greater volumes, reduction of sales to could “strand” overbuilt investments – increasingly in distribution systems.
- Offsetting bills is not the same as “avoiding” cost responsibility.
- Costs appear large if benefits are ignored or not studied objectively.
- Actual costs are often not measured carefully, or at all. Many “cost” estimates are nothing more than:
 - Retail rate times any non-utility generation
 - Retail rate minus wholesale price (“LMP”)

Getting Past Conflict

- Open, data-based analysis

“In God we trust; all other must bring data”

- Regulatory “utility of the future”/DG investigations
NY REV, IA Utility Comm. NOI 2014-0001, MD

- Learn from others & seek best practices

*Other states have grown much bigger markets
with no significant adverse impacts*

- Encourage innovation & market growth

*Explore 3d Party Finance, Shared Clean Energy,
Low- and Moderate-Income programs*

Thank you!

See everything we can find on Value of Solar at the Value of Solar Center of Excellence: <http://voscoe.pace.edu>

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Resources