State-Federal RPS Collaborative Webinar

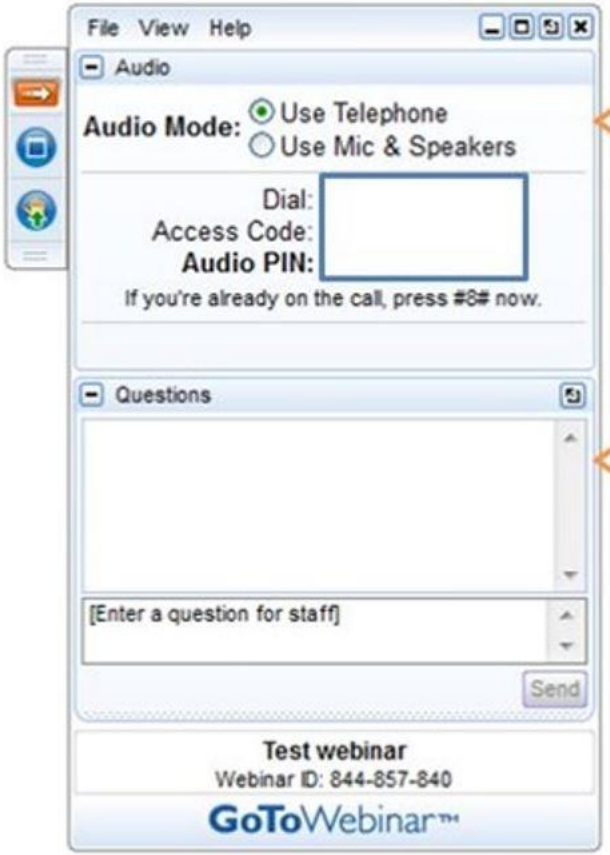
The Effect of State Policy Suites on Solar Markets

Hosted by
Warren Leon, Executive Director, CESA

Monday, February 2, 2015

CleanEnergy States Alliance

Housekeeping



All participants are in "Listen-Only" mode. Select "Use Mic & Speakers" to avoid toll charges and use your computer's VOIP capabilities. Or select "Use Telephone" and enter your PIN onto your phone key pad.

Submit your questions at any time by typing in the Question Box and hitting Send.

This webinar is being recorded.

You will find a recording of this webinar, as well as all previous CESA webcasts, archived on the CESA website at

www.cesa.org/webinars

About CESA

Clean Energy States Alliance (CESA) is a national nonprofit organization working to implement smart clean energy policies, programs, technology innovation, and financing tools, primarily at the state level. At its core, CESA is a national network of public agencies that are individually and collectively working to advance clean energy.

State-Federal RPS Collaborative

- With funding from the Energy Foundation and the US Department of Energy, CESA facilitates the **Collaborative**.
- Includes **state RPS administrators**, **federal agency representatives**, and other stakeholders.
- Advances dialogue and learning about RPS programs by **examining the challenges and potential solutions** for successful implementation of state RPS programs, including **identification of best practices**.
- To sign up for the Collaborative listserve to get the **monthly newsletter** and announcements of **upcoming events**, see: www.cesa.org/projects/state-federal-rps-collaborative

Today's Guest Speaker

Elizabeth Doris, Senior Project Leader, Policy and Technical Assistance, National Renewable Energy Laboratory (NREL)

NREL
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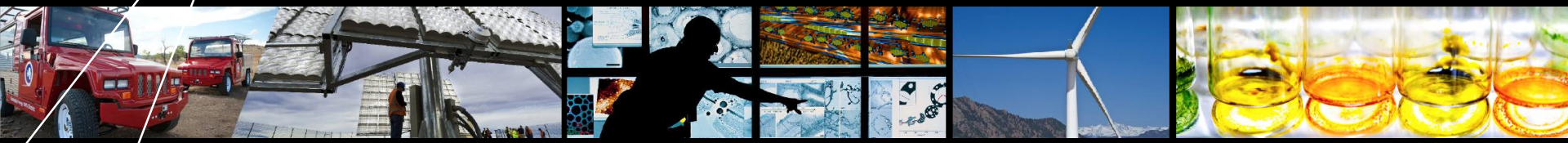
State Policy and Solar Markets



Elizabeth Doris
Technical Manager, Policy and Technical Assistance
National Renewable Energy Laboratory
Presented to the CESA RPS Collaborative
February 2, 2015

National Renewable Laboratory Snapshot

Only National Laboratory Dedicated Solely to Energy Efficiency and Renewable Energy

- Leading clean-energy innovation for 35 years
- 1740 employees with world-class facilities
- Campus is a living model of sustainable energy
- Owned by the Department of Energy
- Operated by the Alliance for Sustainable Energy

Policy and Technical Assistance Team

Catalyzing the 21st century energy transformation by being a conduit between the lab and policymakers, program implementers, and utility decision makers with credible, relevant, actionable information for decision support

Spoiler

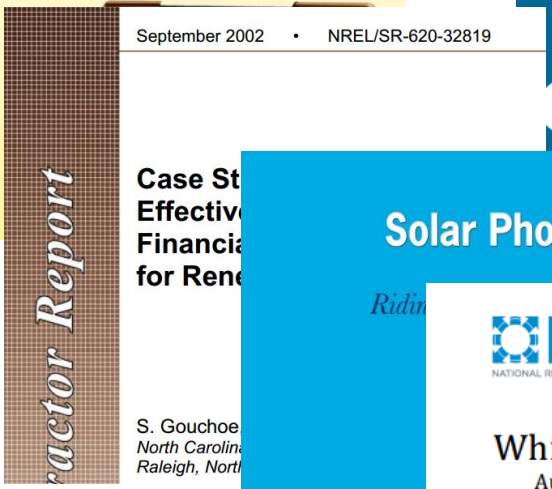
(good) Interconnection and (any) mandates with set asides are driving markets in the US, regardless of market context

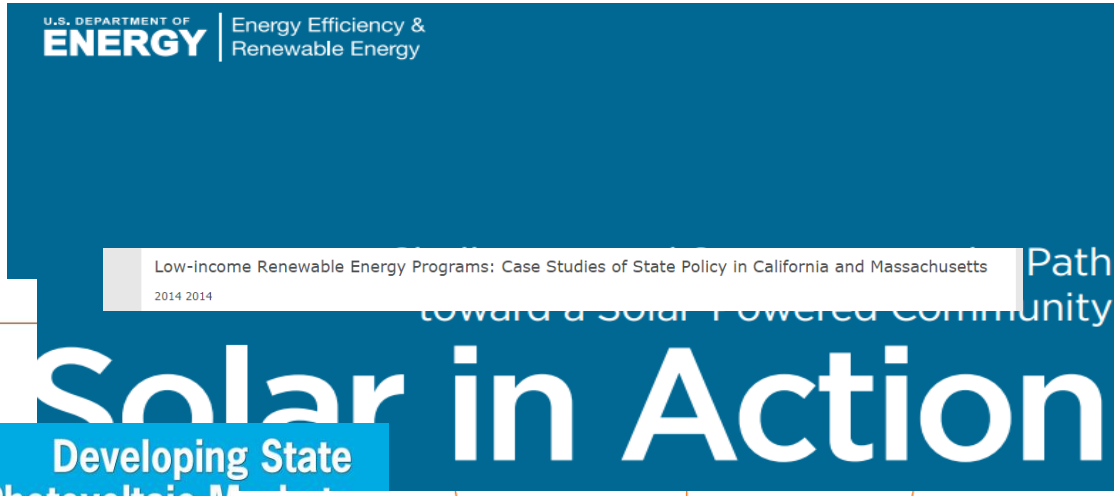
Quantification of Incentive Impact

- Carley, S. (2009). “Distributed Generation: An Empirical Analysis of Primary Motivators.” *Energy Policy* (37:5); pp.1648-1659.
- Sarzynski, A.; Larrieu, J; Shrimali, G. (2012). "The Impact of State Financial Incentives on Market Deployment of Solar Technology." *Energy Policy* (46); pp. 550-557.

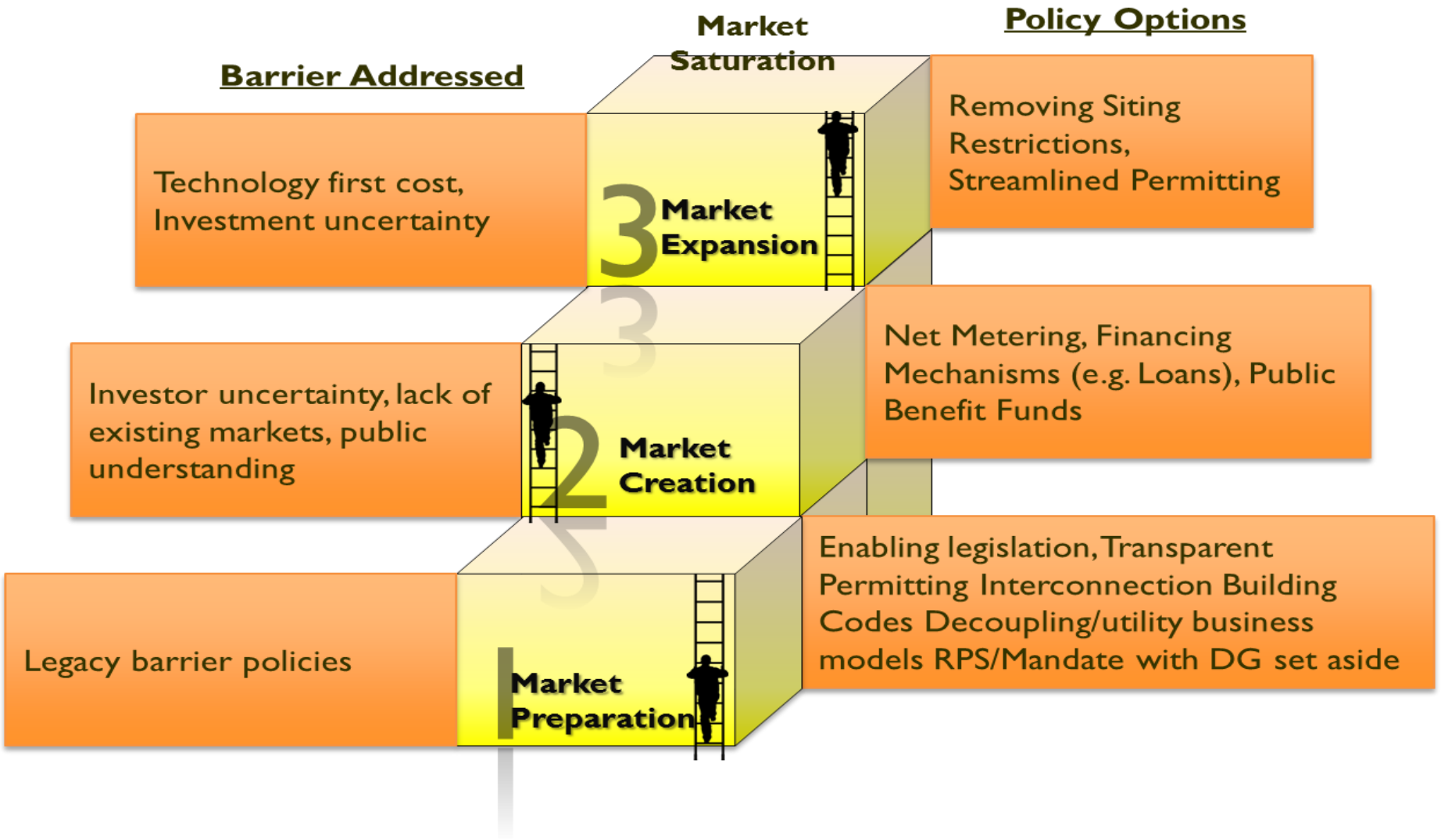
Are Incentives the thing?

Case Studies on What Works





Role of Energy Policy in Market Development



Which Non-Financial Policies are Working?

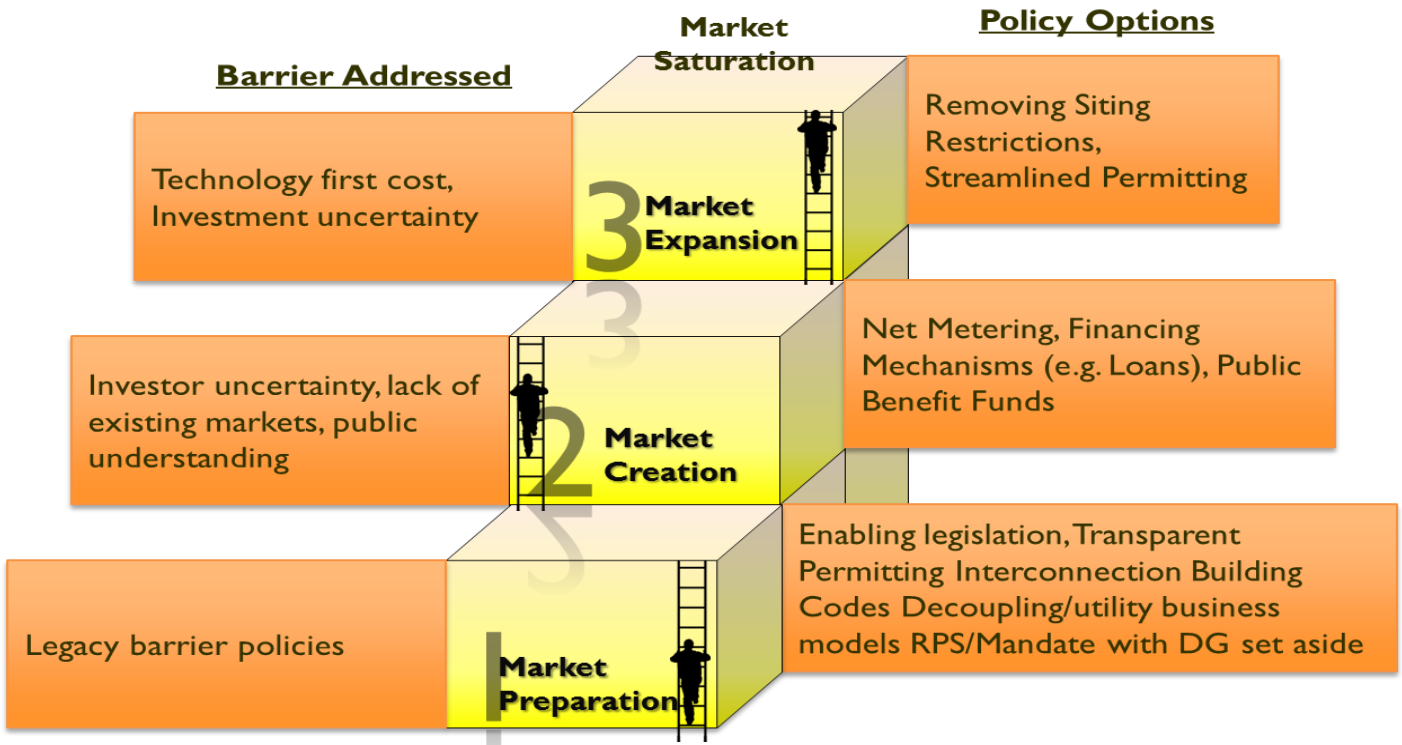
A cross-section econometric analysis that takes into account

- **the quality of interconnection standards,**
- **The quality net metering standards,**
- **Renewable Portfolio Standards (RPS) and integrated distributed generation set-asides, and**
- **a non-policy determinant (population)**

explains about 70% of the variation in newly installed PV capacity across states and indicates that all of the selected policies are significant. Nonparametric statistical tests confirm the regression results.

Source: Krasko and Doris, Energy Policy 2013

Role of Energy Policy in Market Development

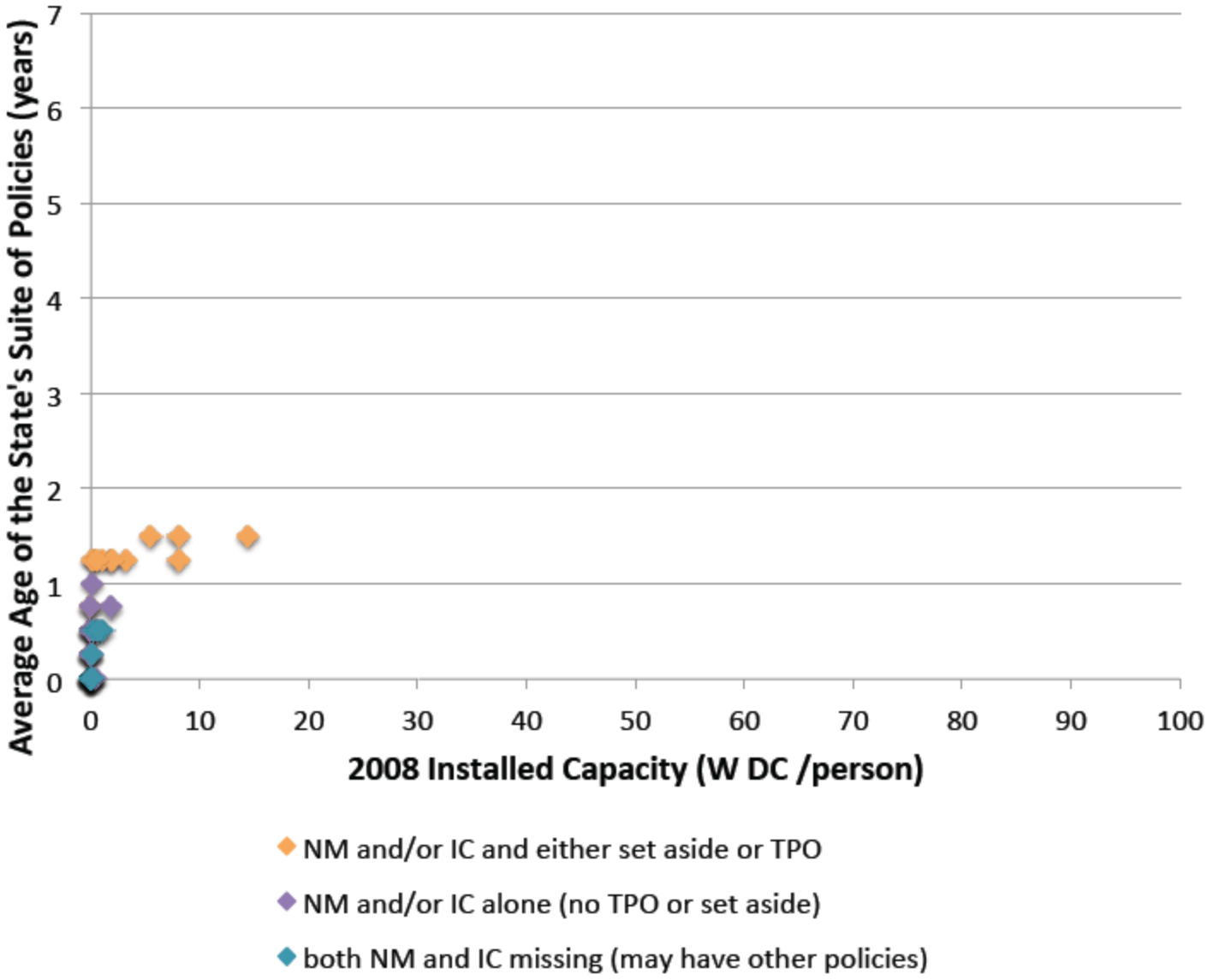


- Low-cost (to government and taxpayers), state-level policies are effective at driving markets for distributed generation
- Incentive policies are more effective at expanding markets when built on a foundation of market-creation policies such as mandates (Renewable Portfolio Standard) and market access (net metering, interconnection) that even the playing field for clean energy distributed generation technologies.

Falling Prices Solve the Problem?

The number of states with significant growth in solar installations has tracked falling prices, but some states have not made much progress.

2008


Average Age of the State's Suite of Policies (years)
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6
7
0
10
20
30
40
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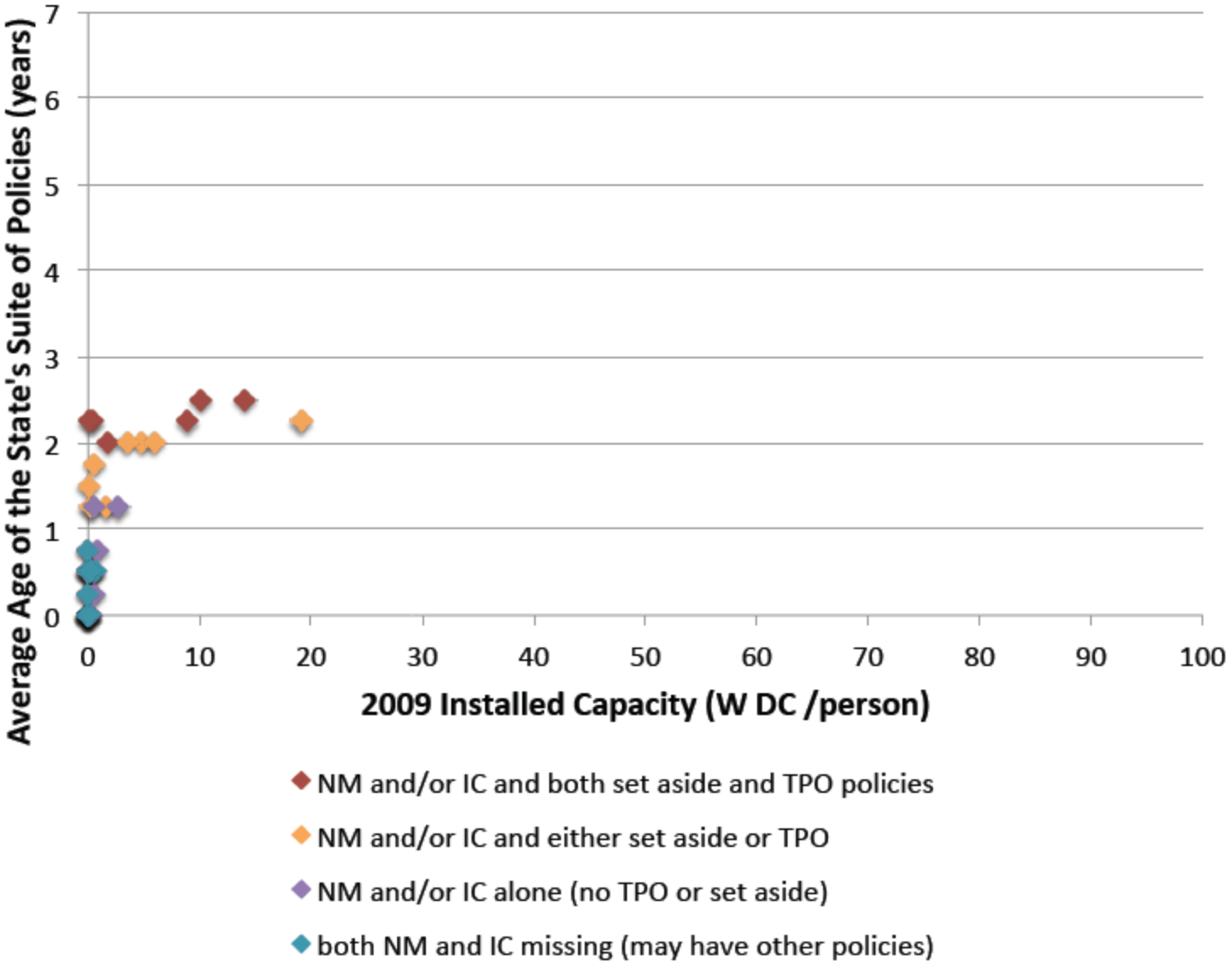
80
90
100
2008 Installed Capacity (W DC /person)
NM and/or IC and either set aside or TPO
NM and/or IC alone (no TPO or set aside)
both NM and IC missing (may have other policies)

2009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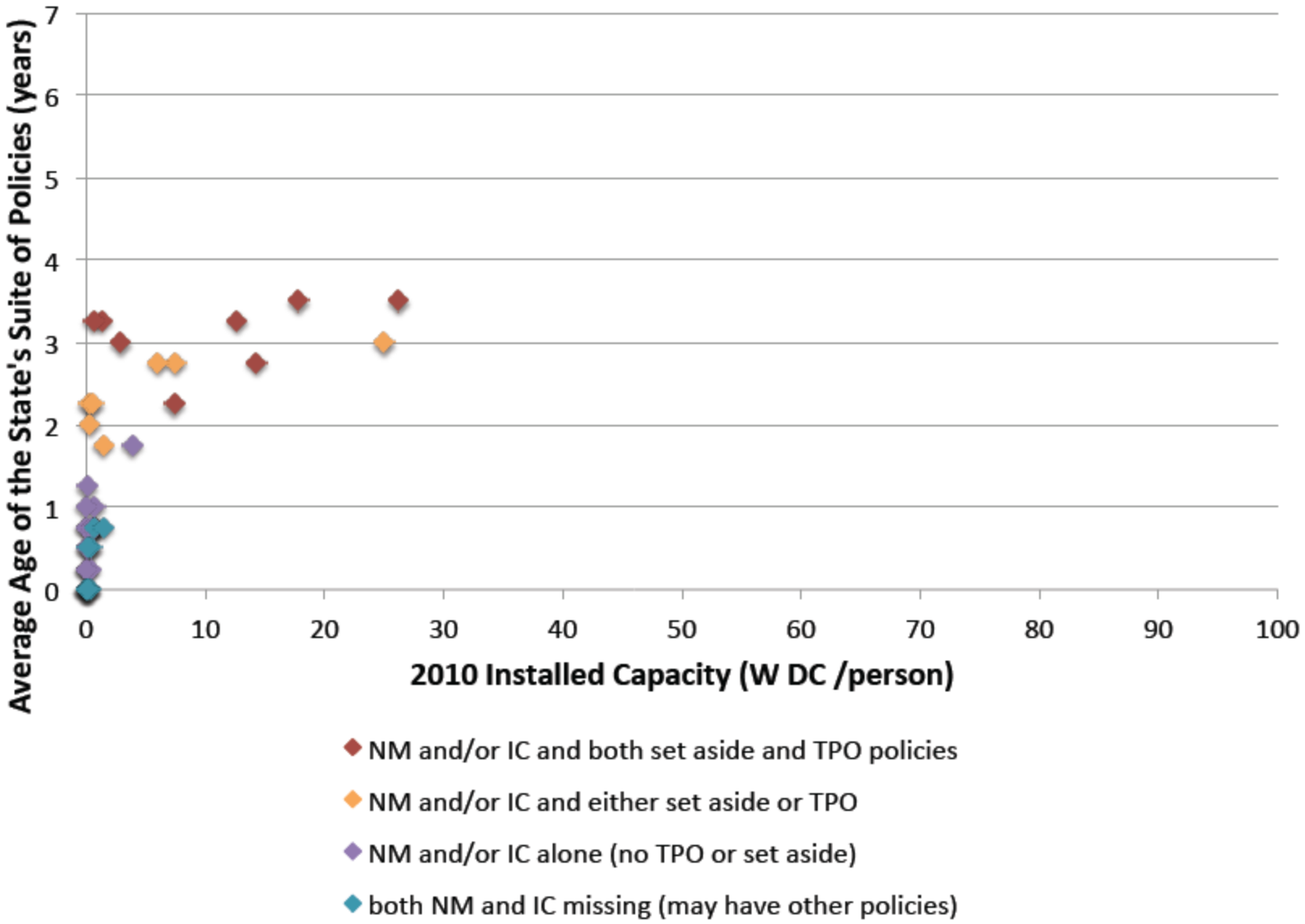
2010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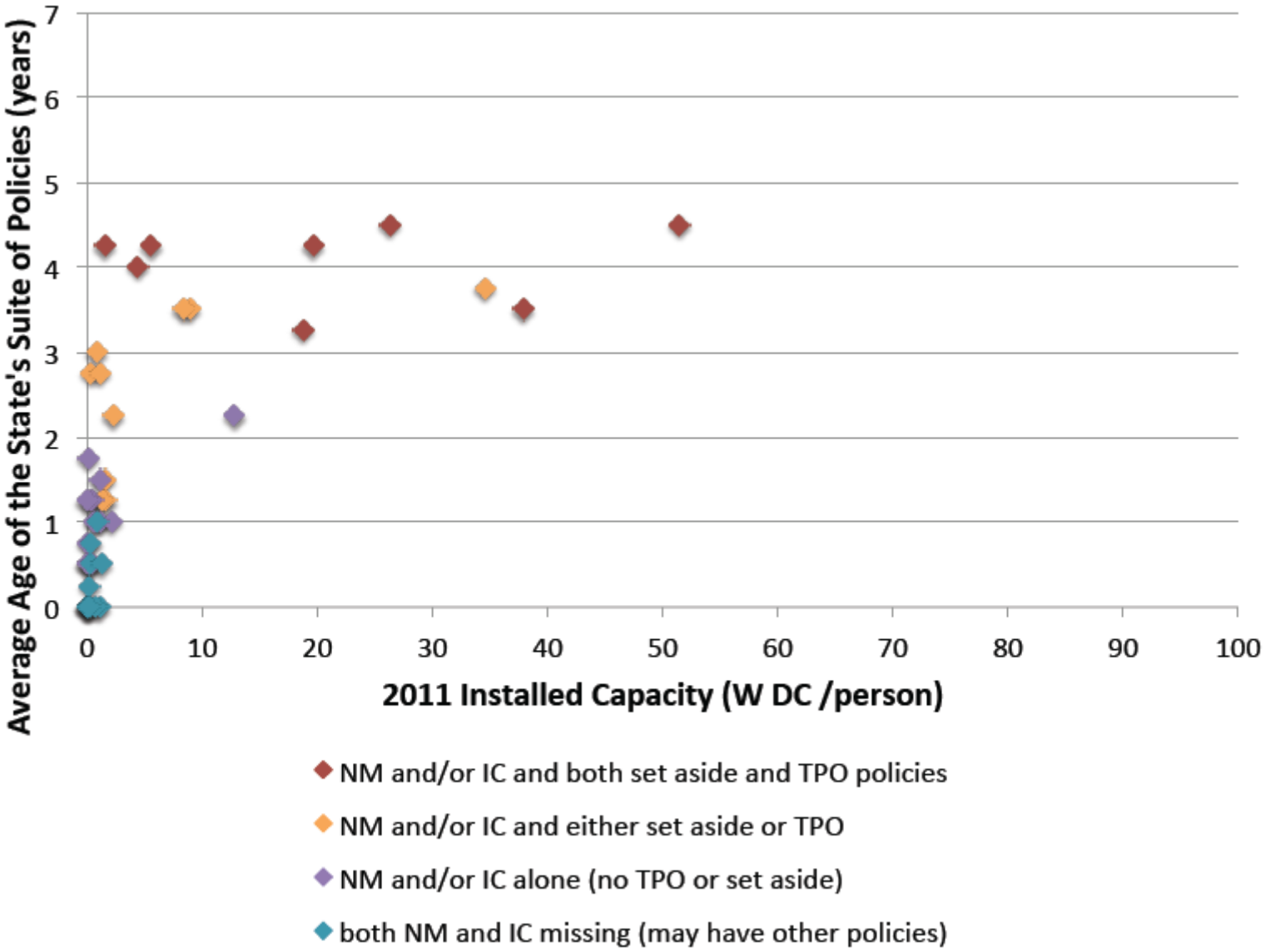
2011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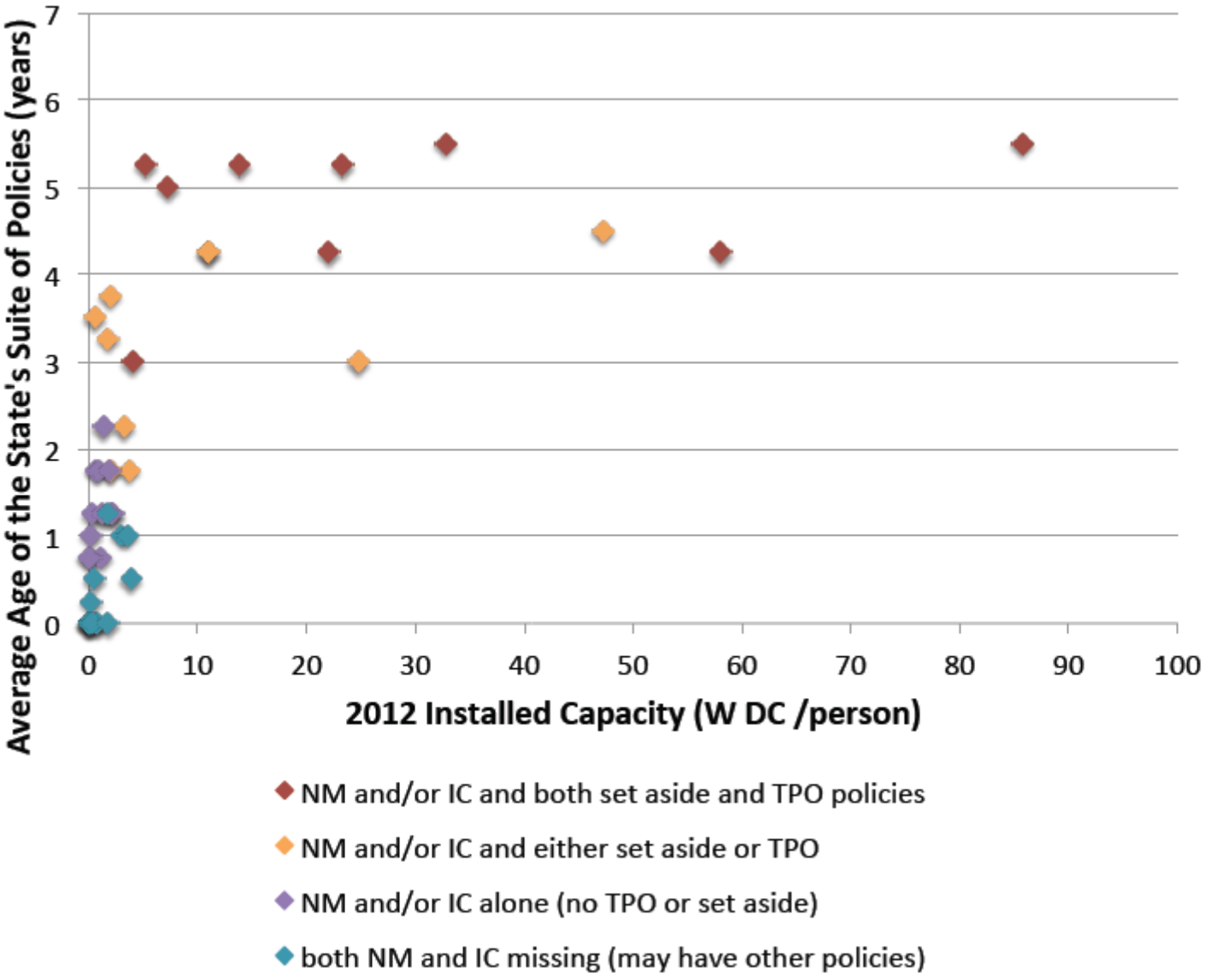
2012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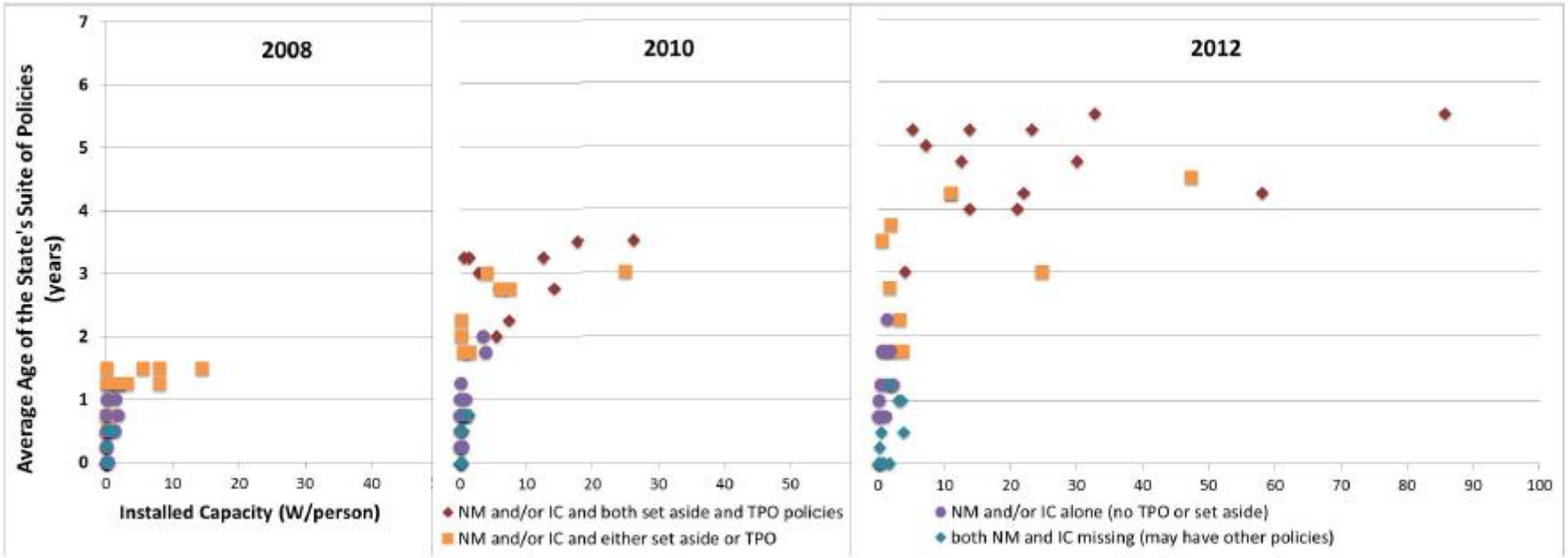
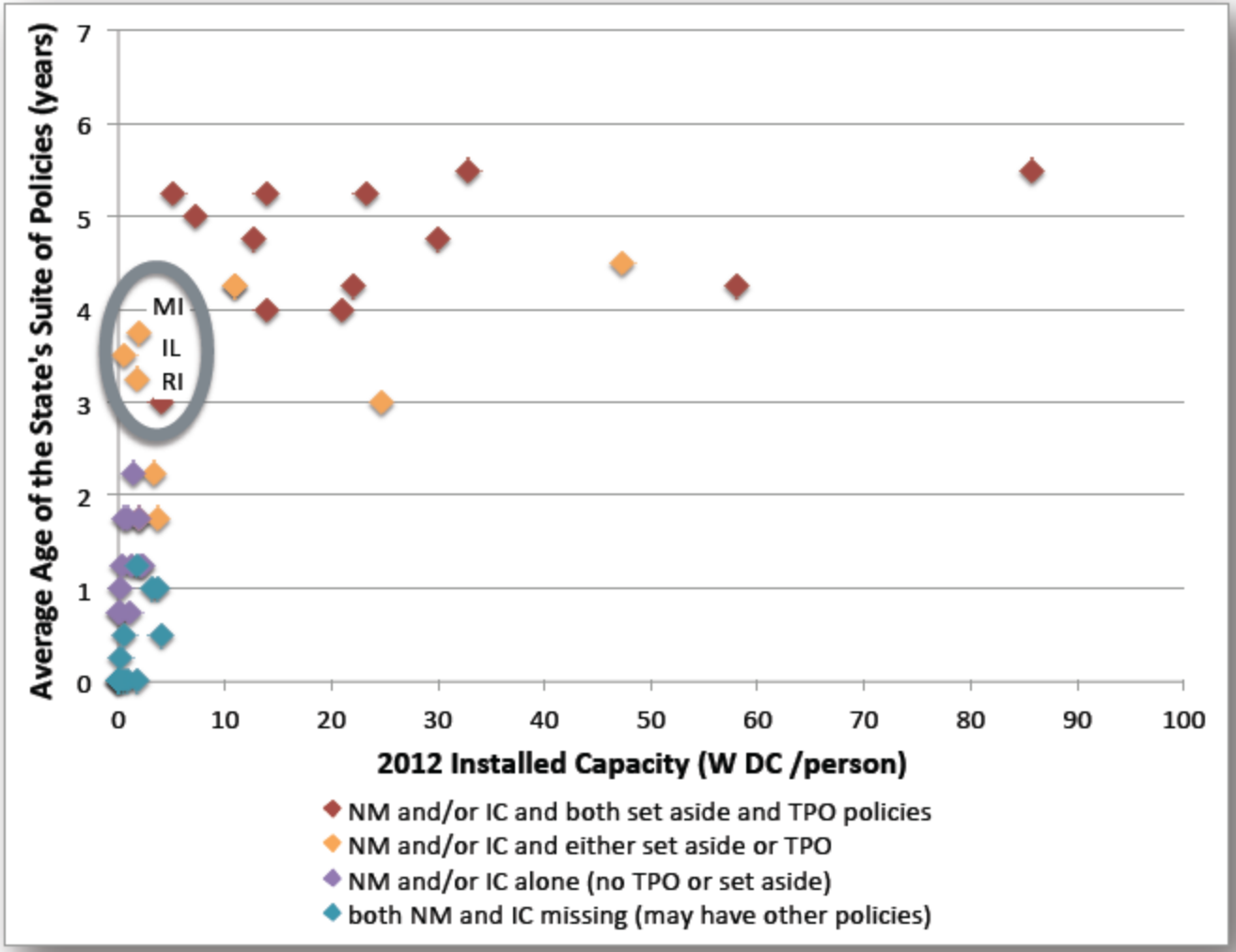
Time is important…

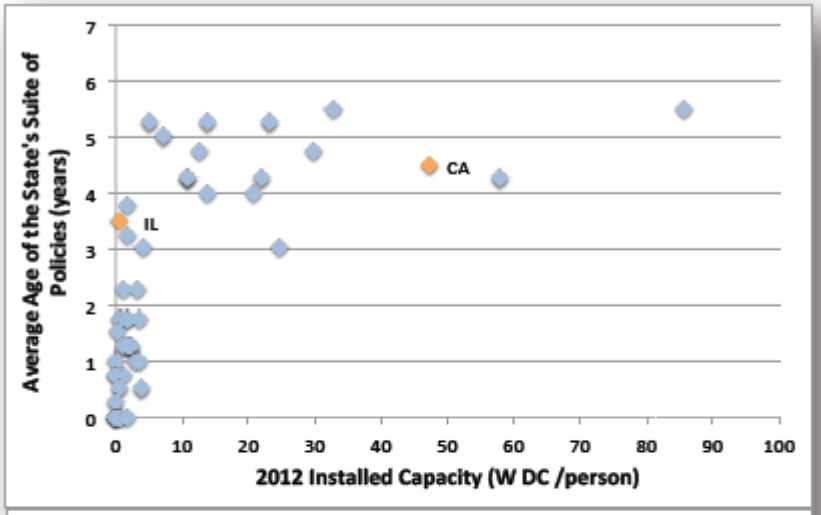


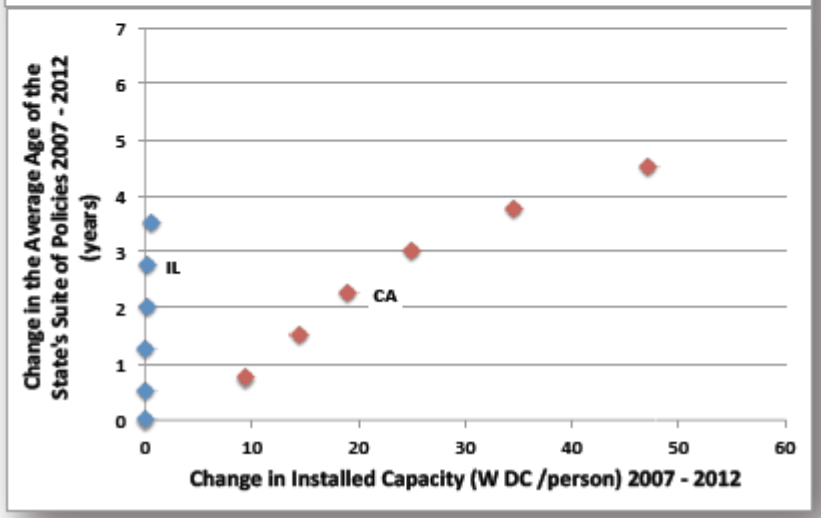
…but it isn't the only thing



Some states are lagging behind peers with similar best practice policies.

What's happening in Illinois?



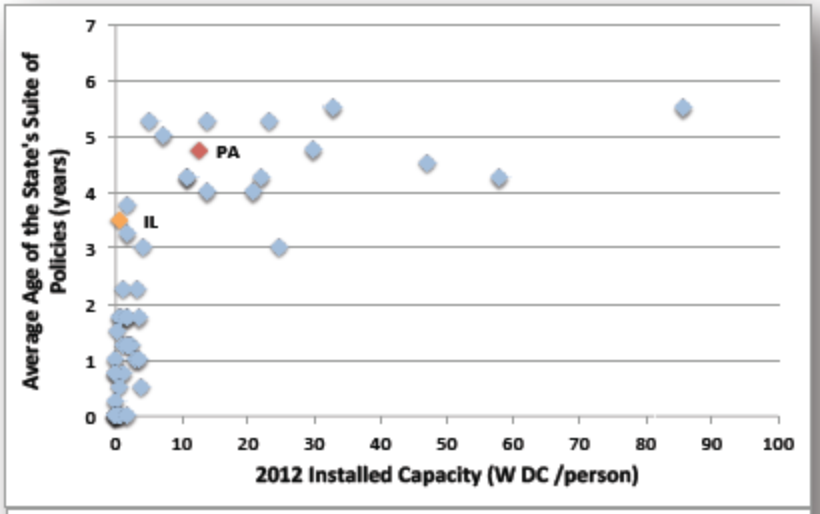


Illinois and California have similar policy suites of similar age,

Policy Age at the End of 2012 (y)	Illinois	California
TPO	5	6
RPS Solar Set Aside Age	0	0
FTG Net Metering	5	6
FTG Interconnection	4	6
State Demographic Factors		
Three-year average retail electricity price; 2010 - 2012 ($/kWh)	$0.11	$0.15
Technical Potential for Rooftop PV (GWh/year)	30,086	106,411
Lifetime Retail Revenue Potential ($/W)	$2.13	$3.67
ACEEE 2012 Scorecard Score	25	40.5

BUT their demographic and economic contexts are very different.

Is there a better model?



Pennsylvania and Illinois have similar demographic and economic contexts.

Policy Age at the End of 2012 (y)	Illinois	Pennsylvania
TPO	5	1
RPS Solar Set Aside Age	0	6
FTG Net Metering	5	6
FTG Interconnection	4	6
State Demographic Factors		
Three-year average retail electricity price; 2010 - 2012 ($/kWh)	$0.11	$0.11
Technical Potential for Rooftop PV (GWh/year)	30,086	22,215
Lifetime Retail Revenue Potential ($/W)	$2.13	$2.16
ACEEE 2012 Scorecard Score	25	21.5

A solar set-aside has helped Pennsylvania's solar market despite an unfavorable economic backdrop.

Takeaways for Policy Makers

Historical analysis illustrates…

- … that interconnection and net metering policies are facilitators for increased market penetration over time.
- … that RPS with a set aside for distributed generation creates an environment for DG regardless of economic favorability.

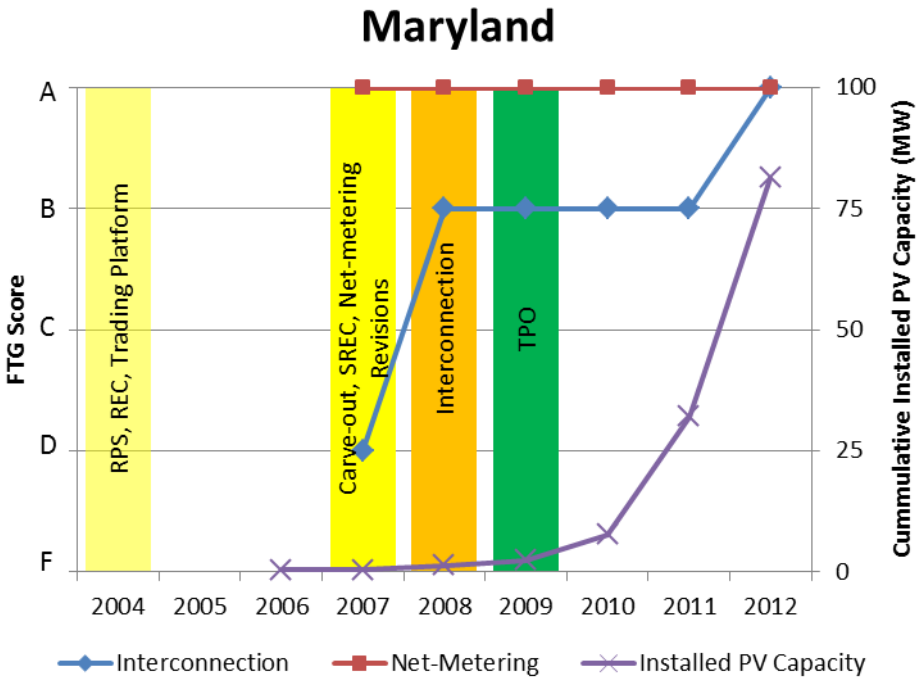
Time Series analysis illustrates…

- … that a suite of best practice policies are needed to spur market growth
- … that these policies have to be in place for a few years before large changes in installations become visible

Successful states have combined high quality foundational policies with market creation and enabling policies tailored to their specific context

What is WORKING in each context

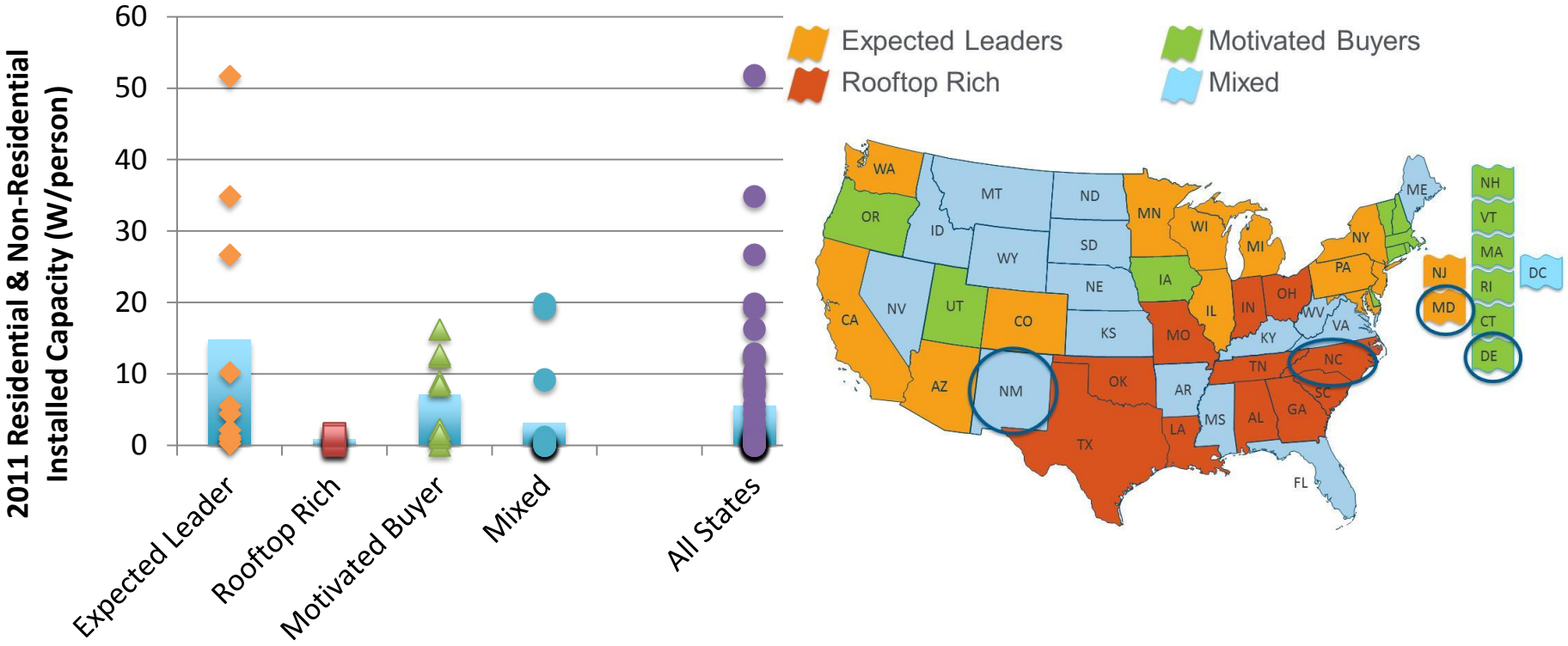
- Expected Leaders (Maryland) a comprehensive policy portfolio, with equal emphasis on all policy types is driving recent market development.
- Rooftop Rich (North Carolina) strong interest from the populous in clean energy related policy distinguishes it from other members of the group.



- Motivated Buyers (Delaware) targeted market preparation and creation policy effectively stimulate
- Mixed (New Mexico) leading state for installed capacity in the group, policy diversity and strategic implementation

Source: Steward, D.; Doris, E.; Krasko, V.; Hillman, D. (2014). Effectiveness of State Level Policies on Solar Market Development in Different State Contexts.

The Importance of Context



Expected Leader	Rooftop Rich	Motivated Buyer	Mixed
1. ACEEE Energy Efficiency Scorecard score ≥ average 2. Estimated technical potential for rooftop PV ≥ median 3. Income > average 4. Cost of electricity >average	1. ACEEE Energy Efficiency Scorecard score < average 2. Cost of electricity < average 3. Income < average 4. Estimated technical potential for rooftop PV ≥ median	1. ACEEE Energy Efficiency Scorecard score ≥ average OR Cost of electricity ≥ average and Income ≥ average	States not identified in the previous three groups. These states have a variety of values for the characteristics evaluated.

Source: Steward, D.; Doris, E.; Krasko, V.; Hillman, D. (2014). Effectiveness of State Level Policies on Solar Market Development in Different State Contexts.

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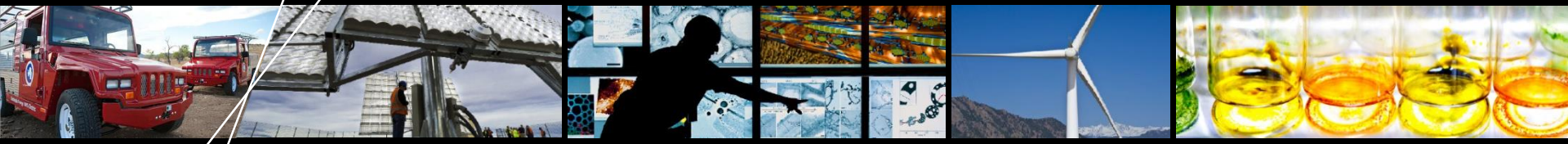

Thank You

Elizabeth.Doris@nrel.gov

(303) 384-7489

Darlene.Steward@nrel.gov

(303) 275-3837

Thank you for attending our webinar

Warren Leon
RPS Project Director, CESA Executive Director
wleon@cleanegroup.org

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