

Comparative Review of Procurement Programs Targeting “Small” Renewables

Galen Barbose, *Lawrence Berkeley National Laboratory*

Contributions from Kevin Porter, *Exeter Associates*

Vermont Public Utility Commission

August 2, 2018 | Montpelier, VT

The work described here was funded by the U.S. Department of Energy Solar Energy Technologies Office



Background on Berkeley Lab's Role in this Proceeding

- ◆ Funded through the “Analytical Support for Public Utility Commissions” Program
 - Launched last year by the U.S. Department of Energy’s Solar Energy Technologies Office
 - Allows state PUCs to submit applications requesting analytical support from national laboratories on issues related to solar integration
 - Vermont PUC submitted a successful application requesting support on the standard offer program proceeding
- ◆ One of several avenues for national labs to provide analytical support to state PUCs and other electric industry stakeholders

Presentation Overview

Goal is to provide stakeholders with a general understanding of current practices and options related to program design

- ◆ Compare other procurement programs targeting relatively small renewables
 - Based on publicly available information (reg. filings, RFPs, contracts, websites, etc.)
- ◆ Focus on program design features relevant to issues raised in this proceeding, principally:
 - Project attrition
 - Bid evaluation criteria and process
 - Relationship to RPS (and broader state energy policy)

10 Programs Included in This Review (plus VT)

- ◆ *California Renewable and Bioenergy Market Adjusting Tariff (ReMAT & BioMat)*
- ◆ *Connecticut ZREC and LREC Program*
- ◆ *Connecticut 2016 Small-Scale Procurement*
- ◆ *Delaware Solar Renewable Energy Certificate Procurement*
- ◆ *Illinois DG Procurement*
- ◆ *Illinois Supplemental Photovoltaic Procurement Plan*
- ◆ *Massachusetts Solar Massachusetts Renewable Target (SMART)*
- ◆ *New Jersey SREC-Based Financing Program*
- ◆ *New York LIPA Commercial Solar Feed-in Tariff*
- ◆ *Rhode Island Renewable Energy Growth Program*
- ◆ *Vermont Standard Offer Program*

General Features of Comparison Programs

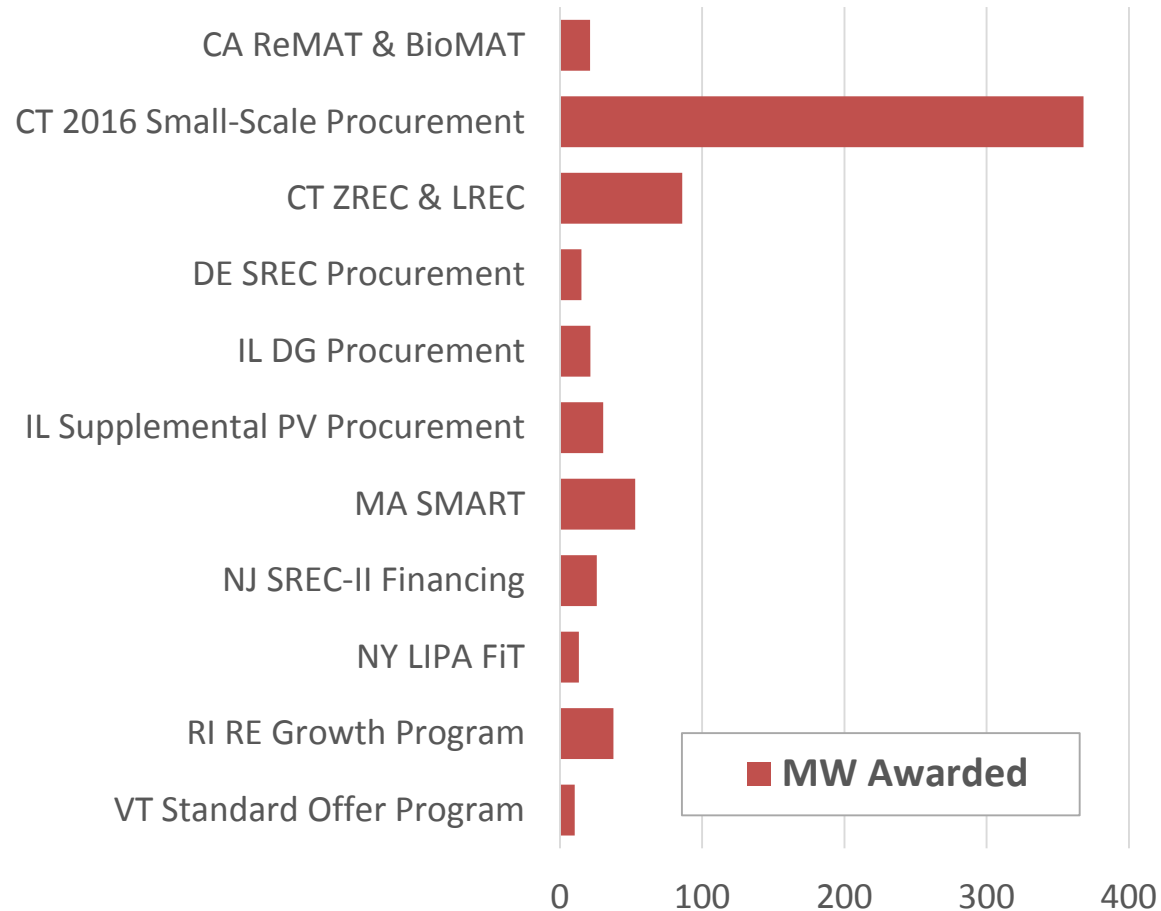
- ◆ Almost all created via legislation
- ◆ Most are competitive solicitations, but several offer standard pricing (first-come, first-served; often for smaller projects)
- ◆ Most have recurring solicitations, but several were just one-time/limited-term programs
- ◆ Many are REC-only procurements, but some are for bundled products (energy + RECs)
- ◆ All for fixed-price contracts ranging from 5-25 years in term
- ◆ Project sizes generally capped somewhere between 1-5 MW (often with size-based tiers)
- ◆ Some limited to behind-the-meter; others focused on utility-connected; some open to both
- ◆ Some open to a broad set of renewable technologies; others are solar-specific
- ◆ Some open to pre-existing projects; others restricted to only new projects

Many Programs Include Tiers or Set-Asides of Some Form

- ◆ **Small projects:** Almost all reserve some minimum amount of budget or capacity for the smallest project sizes (e.g., <25 kW, <50 kW, <100 kW)
 - Some programs have multiple size tiers
 - Small projects may be aggregated for bidding; may include unspecified projects
 - Some offer standard pricing (first-come, first served) in lieu of competitive procurement
- ◆ **Other types of set-asides** also occasionally used
 - Technology-specific set-asides (RI, CA, VT)
 - Based on resource attributes (zero- vs. low-emission in CT, new vs. existing in DE)
 - For low-income site hosts (MA) and brownfield sites (NJ)

Vermont's Program is Relatively Small Compared to Others

Results from Most-Recent Year of Awards

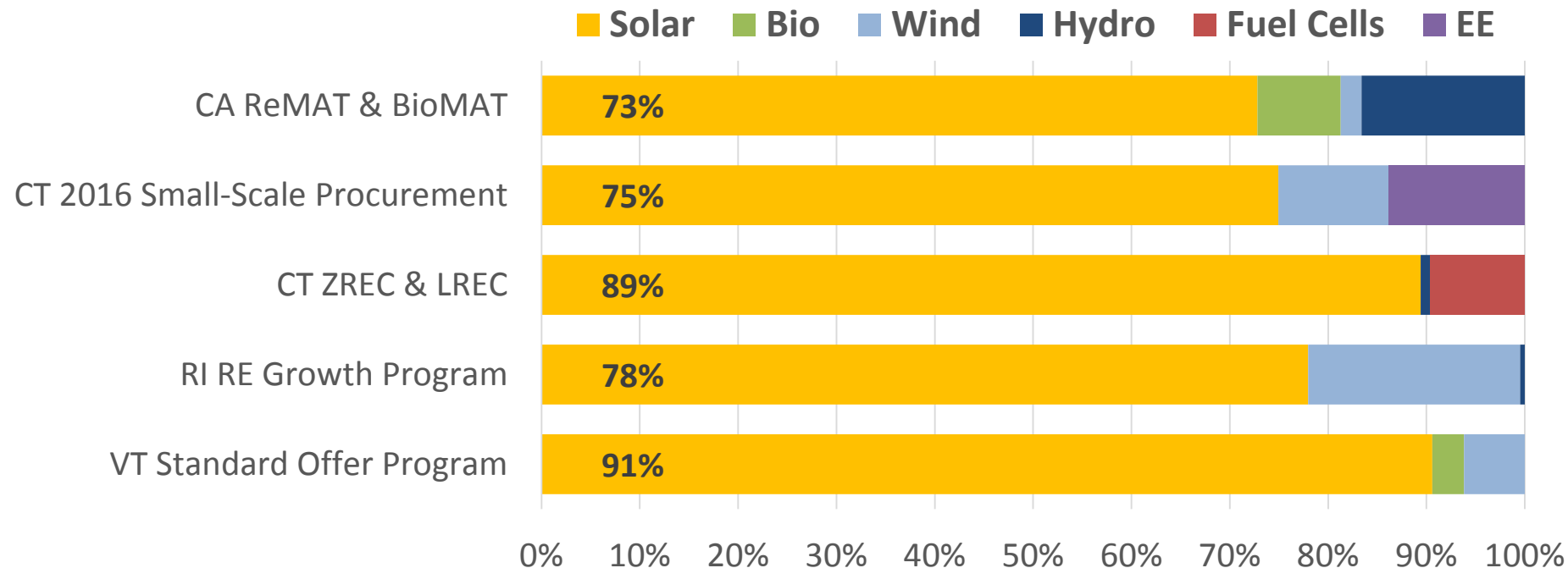


- ◆ Vermont's 2018 standard offer RFP yielded 7 awards for **10 MW**
- ◆ In comparison, most other programs awarded **15-50 MW** (more for CT) in the latest procurement year
- ◆ Some have had much lower participation than targeted
 - NJ SREC-II Financing program: 20% of targeted MW procured in first 8 rounds, on average
 - IL DG procurement: 7-14% of targeted MW procured in first 2 rounds; 100% in 3rd round
 - MA SMART: 50% of targeted MW procured in first round for 1-5 MW projects

Across All Programs, Awarded Projects Skew Heavily toward Solar PV

- ◆ Partially by design: many of the programs are solar-specific
- ◆ Among those open to a range of technologies, most awards have been PV

Technology Mix of Awards To-Date (by MW):

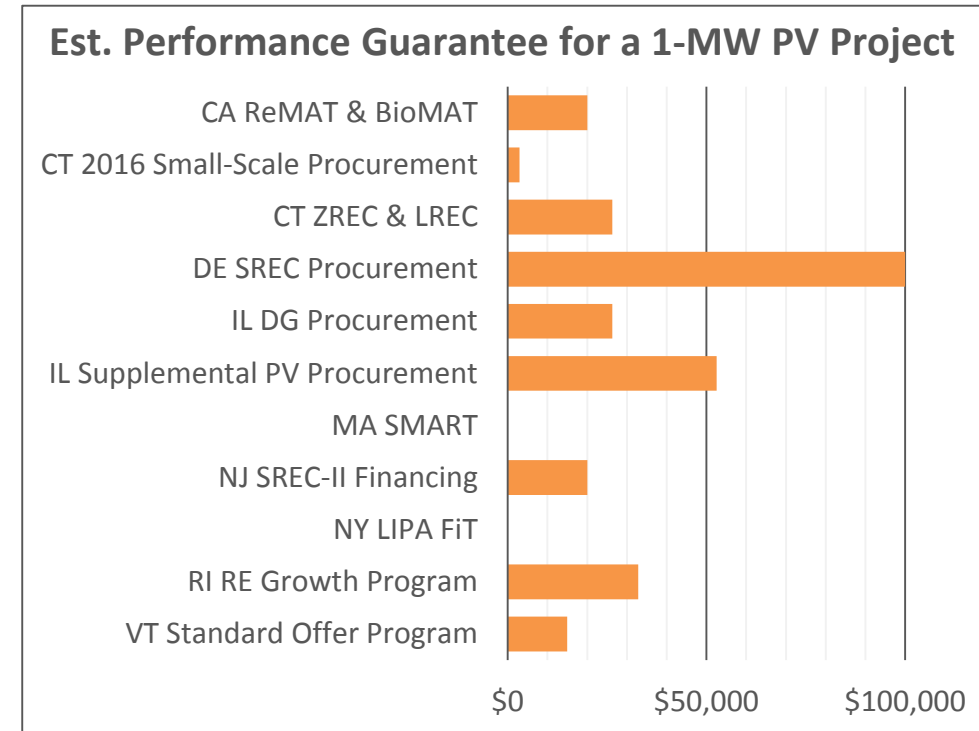


Requirements Related to Site Control and Interconnection

- ◆ All programs require some form of **site control** as a condition for bidding
 - Only exceptions are for aggregations of unspecified small projects (NJ, IL)
 - Required site-control documentation varies considerably, particularly for behind-the-meter vs. utility-interconnected projects
- ◆ Most programs have no specific requirements related to **interconnection application status** as a condition for bid qualification; a few exceptions:
 - RI requires interconnection application filed prior to bid
 - DE requires that application be filed within a specified timeframe

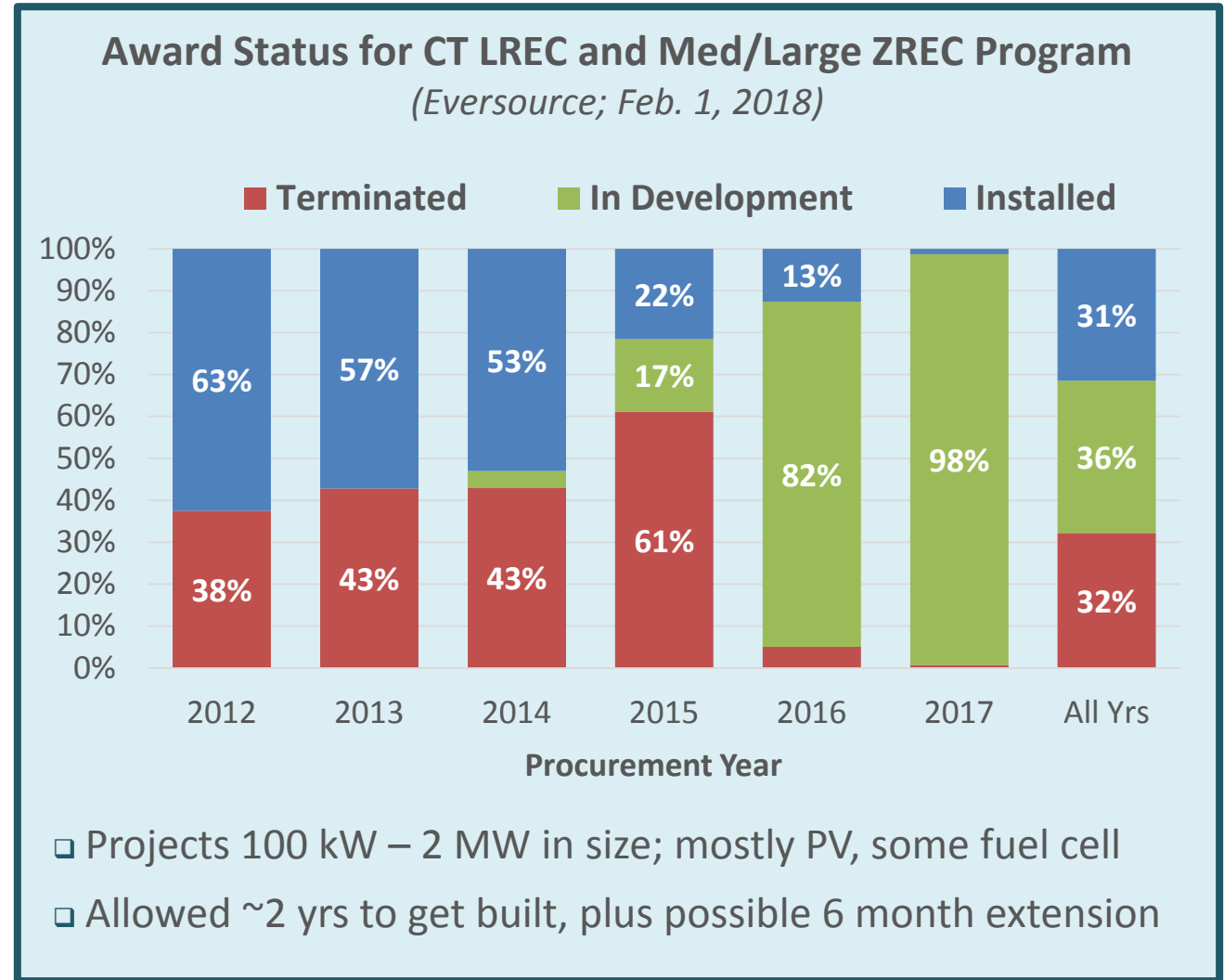
Required Timelines and Performance Guarantees

- ◆ **Required Timeline:** Most programs require commercial operation to commence within 1-2 years of award or contract date
 - Often with the possibility of a one-time extension for a specified duration
- ◆ **Performance Guarantee:** Most programs require some form collateral to ensure timely project completion
 - Forfeited if project doesn't commence by required date and potentially also if seller cancels project
 - Amount based on MW, MWh, or bid value
 - Can vary significantly in size (e.g., from \$0-100k for a 1 MW PV project)



Though Available Data Are Limited, Other Programs Have Also Experienced Project Delays and Cancellation

- ◆ **Vermont:** 6 of 22 projects (27%) awarded through competitive RFPs since 2013 are currently online
- ◆ **CT LREC and Med/Large ZREC:** 31% of the 773 contracts awarded to-date are online; 32% have been terminated (see chart)
- ◆ **CA ReMAT & BioMAT:** Roughly 50% of the 89 contracts executed since 2013 are online; 30% have been terminated

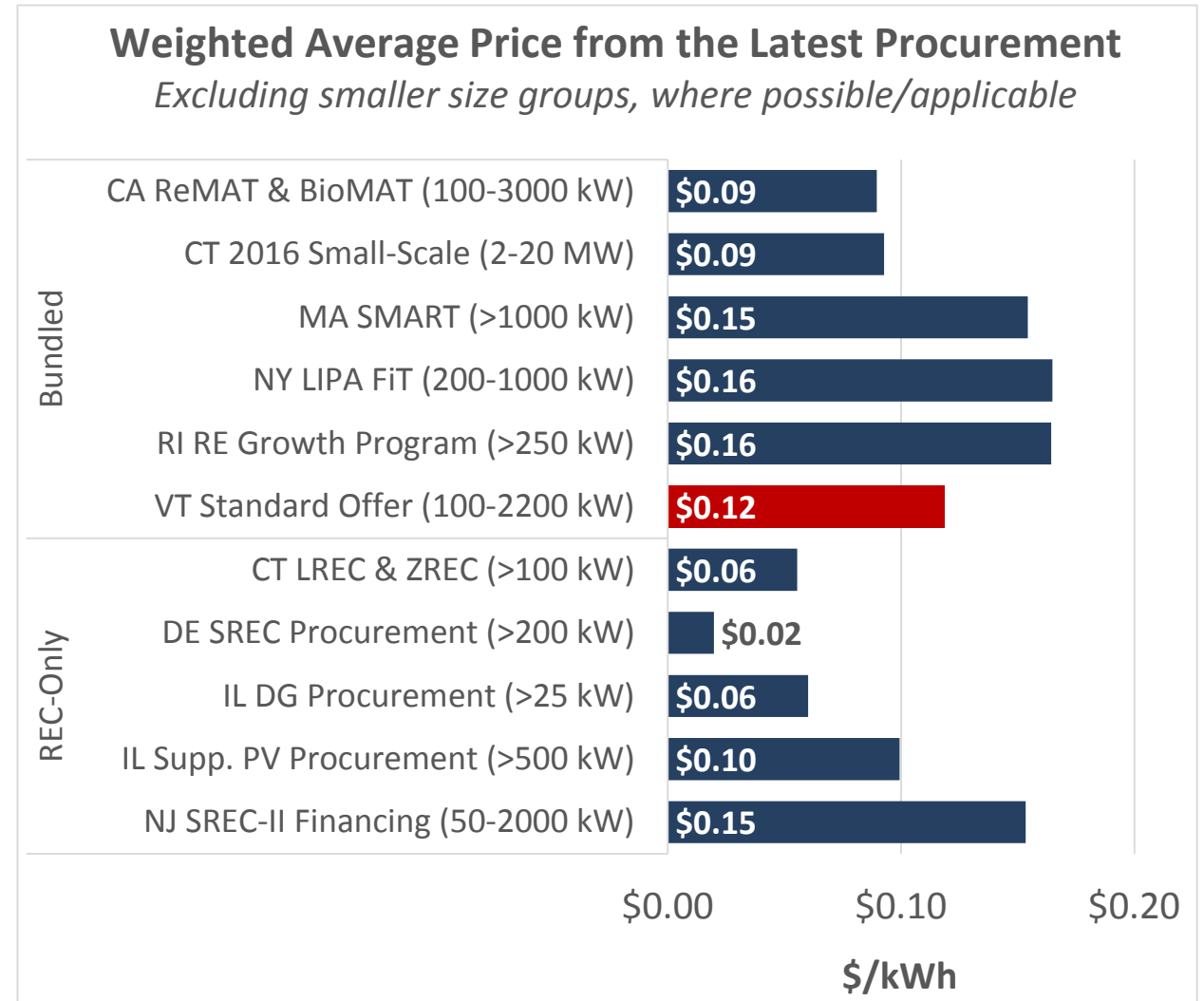


Bid Evaluation and Non-Price Criteria

- ◆ Bids generally awarded based simply on price
 - Subject to any set-asides or tiers
 - Often limited by a price cap (confidential in NJ and IL)
- ◆ Several programs include price adjusters for certain types of projects
 - CT ZREC/LREC and DE both have adjusters for projects with in-state equipment or labor
 - MA has adders for brownfield, landfill, solar canopy, solar+storage, public entities, community solar, and low income
- ◆ CT Small-Scale program evaluated bids based on NPV relative to market prices, along with a range of qualitative factors required by statute
 - *Using forecasted LMPs in NPV calculation implicitly provides locational preferences*

Pricing from Latest Procurement Rounds

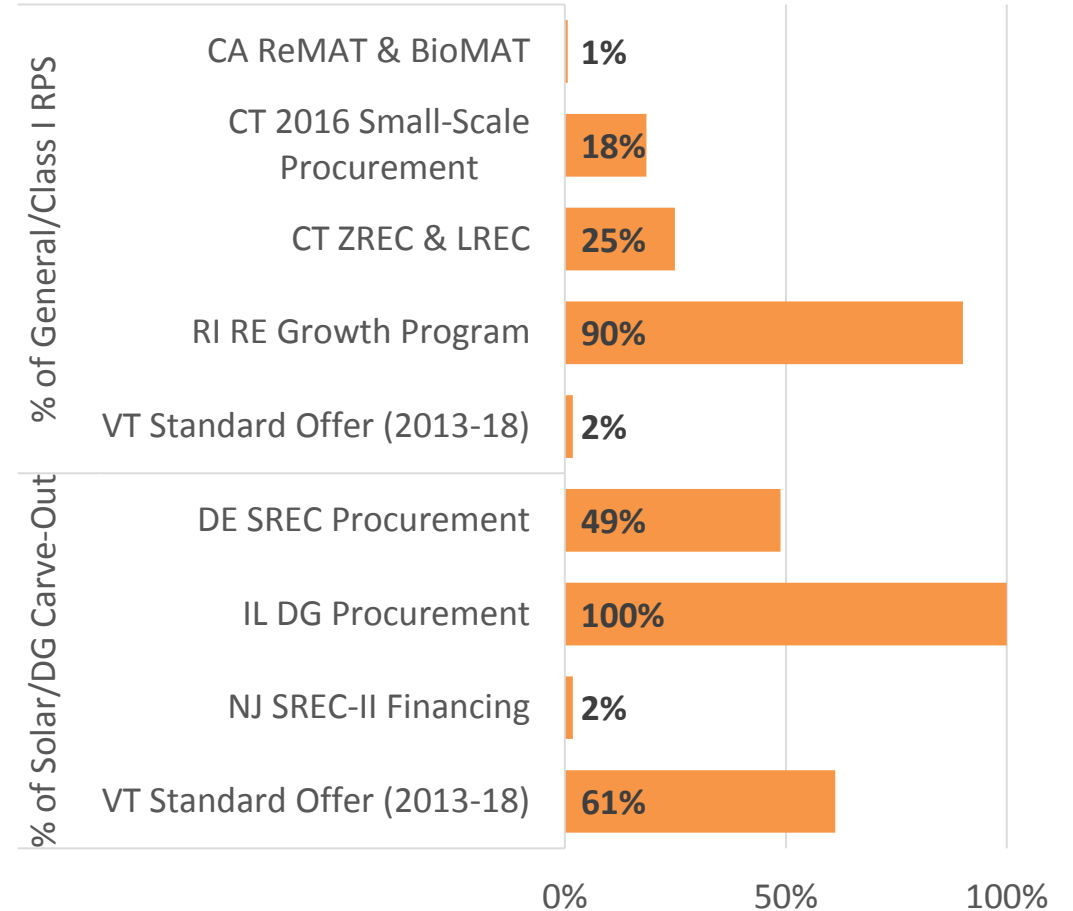
- ◆ Challenging to directly compare pricing across programs given differences in timing, project sizes, eligible technologies, contract terms, etc.
- ◆ REC-only programs largely focus on behind-the-meter applications; those projects also receive net-metering
- ◆ Based on the data points here, pricing in Vermont's program appears generally in line with its peers



Relationship to State RPS Programs

- ◆ The programs reviewed are generally intended to serve RPS compliance obligations
 - General/Class I obligations or solar/DG carve-outs
 - Overall significance within the context of broader RPS procurement activity varies considerably (see chart)
- ◆ Implicit rationale may be to support projects that otherwise have limited opportunities to participate in the RPS
 - But that offer some unique value or advance complementary policy goals
 - Offer revenue certainty through long-term contracts
 - Alternative to traditional rebate programs

All Awards to Date as % of Current RPS Demand



General Themes and Take-Aways

- ◆ Procurement programs targeting small renewables are commonly used in tandem with RPS, net metering, and other, broader policies
- ◆ The specific role and design of the programs varies, and regulators' ability to fine-tune is often constrained by the enabling legislation
- ◆ Many of these programs are hybrids between pure competitive solicitations and standard offer/FiT-type programs
- ◆ A variety of approaches are used to preferentially favor certain types of projects
- ◆ Programs often include special provisions to enable participation by small projects—e.g., standard pricing, set-asides, aggregation
- ◆ Contract failure not uncommon (can be an issue for larger scale procurement as well)

Thank You!

Contact information:

Galen Barbose

gbarbose@lbl.gov

(510) 495-2593

Sign up for our email list to be notified of new research:

<https://emp.lbl.gov/join-our-mailing-list>