Comments of the New Jersey Solar Energy Coalition
Successor Program and Capstone Modeling
Docket No. QO20020184
September 8, 2020.

The New Jersey Solar Energy Coalition appreciates the opportunity to provide written comments on the Successor Program and Capstone Modeling. We commend the board staff for establishing this stakeholder forum. We look forward to our continuing participation in the forthcoming workshops in the weeks and months ahead to the development of the more detailed elements of the successor program.

New Jersey Solar Energy Coalition is a broad coalition comprised of New Jersey solar developers active in all market segments, solar financing functions, engineering, accounting, legal, and renewable energy credit trading firms employing thousands throughout New Jersey.

Overarching Comments Policy

The following areas are deemed critical to the success of the Successor Program and Capstone Modeling effort:

- In our opinion, total compensation model is best described as a "policy targeted" fixed incentive program that is re-adjusted for new project applications on a preset three year rolling basis. While the three year adjustments will be driven by "index changes" reflected in material, labor, financing, inflation, and other broad cost influencers, we would also recommend that the board exercise its authority to make annual adjustments should any market segment fail to support the policy goals of the program. We believe that a "fixed" incentive structure will result in the highest level of investor confidence thereby resulting in the lowest project financing costs achievable, and regular adjustments every thirty six months will ensure that the total compensation paid is regularly "trued up" to current cost and revenue data protecting ratepayers. The three year review should be streamlined to the extent possible to evaluate a preset number of parameters and be the subject to an administratively set hearing process in order to consider input from all stakeholders. Naturally, any changes would then only be reflected in subsequently approved applications thereby preserving legacy successor project financials.

- We believe that the Massachusetts SMART program design properly sets total compensation levels for both behind the meter facilities and standalone facilities. We also observe that this incentive model may take time to fully implement, particularly as it relates to standalone grid facilities subject to a new solicitation process. We look forward to the workshops that have been offered as a collaborative means to develop the details of the program. In the interim period, the TREC type "fixed incentive" structure should be carried forward, with the on-going workshops charged with further successor program development and policy refinements that can be then folded into the program as appropriate going forward.
- The incorporation of "adders" and "subtractors" will further make clear to the solar development community state policy objectives and pave the way for coupled battery storage incentives and other important system enhancements.
- The concept of a competitive bid solicitation should be restricted to all *ground mounted grid connected projects* grouped by size. Large grid connected rooftop projects, "net metered" community solar projects irrespective of interconnection voltage, and all "net metered" behind the meter projects, however, should follow the administrative blueprint of the Massachusetts SMART "behind the meter" administratively set incentives.
- The three years review period will also provide an opportunity to include new technologies and assign appropriate factors as may be required for new market segments.
- Incorporating out-of-state grid connected utility scale projects into the New Jersey Solar Clean Energy Program in a competitive process is completely unworkable due to the high cost of project development in New Jersey when compared to other PJM states. It is, however, appropriate to permit out-of-state solar projects to sell their Class I production attributes to New Jersey compliance buyers consistent with current practice for other out-of-state Class I generators.
- The large scale grid connected solicitation process will very likely take time to fully develop, therefore, it is recommended that the administratively set incentive "net metered" program move forward first, independently in order to adopt these important changes in the earliest possible timeframes.
- Finally, we have identified a number of inputs to the Capstone modeling inputs that are inconsistent with our members' direct cost and system performance experience. We have identified these modeling gaps at the end of this document and our members are prepared to provide full documentation to support any and all of these inputs upon request.

While many of the questions answered below will expand upon these issues and offer program "enhancement" proposals, the overall success of the program lies in resolving these overarching issues collaboratively at the earliest possible opportunity.

Topic 1: Recommended Incentive Structure Design

Based on stakeholder engagement to date, Cadmus presents three incentive "types" in the draft Capstone Report that could be used to inform the design of the Successor Program (see section 3.3, p. 16 – 25):

- Total Compensation: similar to a contract-for-differences model, a total compensation incentive structure calculates all the revenue streams generated by a representative project to arrive at a complementary performance-based incentive amount that may change over time as revenues change to achieve an administratively determined investment target. The incentive value is added onto these revenues to reach a total fixed compensation value.

- Fixed Incentive: a fixed incentive structure is one in which the value of the performance-based incentive is fixed over time, similar to the current Transition Incentive Program.

- Market-Based RECs with Floor: a market-based REC is an incentive that varies over time above a pre-defined floor price, based on the supply of RECs produced by eligible solar projects, and the demand set by the RPS.

1) The draft Capstone Report recommends the implementation of a bifurcated incentive structure, with a competitive solicitation for utility-scale projects and fixed, administratively-set incentives for smaller projects.

a. Do you agree with this recommendation? Why or why not?

Yes, a bifurcated incentive structure would appropriately compensate utility scale "standalone" projects in order to competitively account for economies of scale. Net metered projects compensated on a "fixed" incentive structure basis set administratively would appear the best option available in order to achieve the closest incentive alignment with specific project needs minimizing overall ratepayer costs. Resetting these administratively set incentives on a regular basis would achieve the benefits of a contract for differences model without the enormous administrative undertaking (as Massachusetts has recognized) of continuously making administrative changes to incentive levels for thousands of net metered projects across the landscape of all EDC tariffs.

b. If you agree with this recommendation, how should NJBPU divide market segments between those projects eligible for the competitive solicitation and those projects eligible to receive the administratively set incentives?

i. Do you view project size as the appropriate means of differentiating between competitive solicitations and administratively-set incentives? If so, please identify what NJBPU should consider to be the size limit between a utility-scale and small scale project.

Non-net metered ground mounted grid connected projects should be considered separately and administered exclusively under a framework of competitive solicitations. These projects can be appropriately grouped as Massachusetts SMART "standalone" projects into two distinct

segments: under 10 MWs under a "standard offer" scenario, and 10 MWs and above under an open solicitation subject to a number of structural recommendations covered below. We would further recommend that large-scale grid based, non-net metered ***rooftop installations*** be considered for an administratively set incentive as a preferred siting segment factored appropriately inasmuch as these projects are unique and one off in scope.

ii. If project size is used to differentiate incentive-types, how should NJBPU develop a competitive solicitation for utility scale projects that takes into account the different revenues that net metered projects earn compared to those that sell at wholesale?

In our opinion ***all*** net metered projects would be subject to administratively set incentives, as Massachusetts SMART "net metered" projects. Therefore, a competitive solicitation for a utility scale "standalone" projects grouped by size as previously recommended would not need to resolve differences between wholesale and retail values.

iii. Alternatively, should all net metered projects rely on administratively-set incentives instead?

Yes.

iv. If you recommend a different option for establishing criteria to distinguish projects that qualify for competitive solicitations versus fixed incentives, please elaborate on your recommendation.

Not Applicable.

v. How should projects that meet the requirements of the Solar Act subsection (t) (i.e., grid-supply projects located on landfills and brownfields) be treated?

As utility scale grid connected projects, subsection (t) projects on landfills and Brownfields should receive incremental "adder" incentives as a preferred site in order to cover the incremental costs associated with these more expensive installations.

c. If you disagree with the concept of a bifurcated competitive solicitation and fixed, administratively-set incentive approach, what would you suggest as an alternative incentive structure? Please be as specific as possible.

Not applicable.

2) If NJBPU were to implement administratively-set incentives:

a. How often should the incentive value be re-evaluated and potentially reset? Please comment on the mechanism by which NJBPU should consider modeling and analysis to inform future deliberations regarding incentive values.

The successor program should be broadly re-evaluated every three years in order to review updated project installation costs by segment, revising factors as necessary and reevaluating other cost and

revenue streams appropriately. Significant exogenous cost/revenue changes that create dysfunctional market distortions, however, should be reflected in new projects annually at the mid-year point, with due consideration provided to long lead time projects. This annual review will also present an opportunity to review ***new technologies*** for appropriately factored inclusion into the program. The review process should be streamlined to the extent possible to evaluate a preset number of parameters and be the subject to an administrative hearing process in order to consider input from all stakeholders. Naturally, any "topline" changes to the total compensation program would then only be reflected in subsequently approved applications preserving legacy project financials.

b. Should NJBPU differentiate the incentive value (similar to the TREC factors)? If so, on what basis? Please discuss whether NJBPU should differentiate based on the following: (i) customer classes; (ii) installation type / project location; (iii) EDC service territory; (iv) project size; or (v) other.

The current market segmentation under the TREC program provides sufficient differentiation for installation types through appropriate segmentation of market products. In order to refine the policy objectives appropriately, however, consideration should be given to a more expansive matrix of factor "adders" as detailed below (Massachusetts SMART model):

Location Based Factors	*Off-Taker Factors*	*Energy Storage Factors*	*Other*
Dual Use Agricultural	Residential	Storage + PV (formula driven)	Solar Tracking
Brownfields	Community Solar		
Landfills	LMI Community Solar		
Floating Solar	Public Entities		
Solar Canopies	Low Income Residential		
Building Mounted			

c. How is an administratively-set incentive consistent with NJBPU's goal for continually reducing the cost of solar development for ratepayers, in line with the reductions in the cost of solar development?

Under a fixed compensation program, every three years installation costs would be reviewed, and topline incentive levels would be adjusted accordingly. This process would preserve fixed incentive levels for then "legacy" successor projects while aligning successive tranches with reduced or increased ratepayer costs, as warranted.

d. In the draft Capstone Report, Cadmus used a 15-year Qualification Life (i.e., incentive term) as the base case, with the exception of residential net metered direct-owned projects, for which the incentive term was set at 10 years based on project payback period. Please comment on these respective proposals regarding length of qualification life, including what changes you would suggest, if any, and why.

We believe that the 15-year qualification life is adequate and should be set as a standard for all administratively set incentives. While we have not reviewed the economic basis for the reduction to 10-years for direct owned residential projects, we are of the opinion that the eligibility period should be a universal constant irrespective of market segment for administratively set incentives.

3) NJBPU were to implement incentives based on a competitive solicitation:

a. How should the competitive solicitation be designed? What evaluation criteria should NJBPU implement in administering the solicitation? Should project selection be based exclusively on price (i.e., value of the incentive), or should it include consideration of other criteria (and if so, which ones)?

While price should be considered a major factor in the evaluation criteria, it is clear that subsection (t) and other preferred project sites should receive some type of factor "adder" in order to provide reasonable compensation for the incremental cost of developing projects on challenged sites. Clearly, only New Jersey sites connected to the distribution, sub-transmission or transmission system should be permitted to participate in the competitive process.

b. Cadmus studied incentive structures for the environmental attributes of a given project (i.e., unbundled the environmental attribute, with projects remaining merchant on energy and capacity values). Please discuss project finance-ability of this incentive structure, as opposed to a bundled incentive structure, addressing the implications to price and risk to ratepayers.

The bundled incentive structure is fair, is more easily financed would result in less price and risk to ratepayers.

c. How would NJBPU set the incentive value using a competitive solicitation? In particular, please discuss the pros and cons of a pay-as-bid system or a single-clearing price system.

A workable scenario might first involve the board's setting of a maximum bid value, then setting the total solicitation size in MW's to be procured within the sized differentiated groupings described herein, and then letting the market set the total compensation incentive under a single clearing price "Dutch" auction. Dutch auctions lead to more aggressive bidding because the nature of the auction process means the bidder is protected from bidding a price that is too high. The Dutch auction model is extensively used by government agencies for public offerings of T bills, notes, bonds, and other securities.

d. Should NJBPU implement a minimum and/or maximum bid value in order to prevent overly aggressive or overly high bids?

Yes, reasonable bandwidths should be administratively set along with the size and scope of the solicitation.

e. How often should NJBPU hold solicitations? How can NJBPU mitigate the risk of

"stop and start" development cycles due to the nature of punctual solicitations? For example, should NJBPU consider implementing an "always on" incentive program in the context of a competitive solicitation? How would such an incentive be implemented?

The board should set the size of the solicitation in accordance with its policy goal of developing grid scale projects up to pre-set segment of the solar RPS within any given energy year. Any unused capacity remaining, if any, could then be added to the ensuing solicitation in the next energy year.

f. Should NJBPU account for differences in project cost for different project types (e.g., project type or site, in-state vs. out-of-state)? If so, how?

In-state cost differences associated with the higher incremental cost of preferred siting should be handled through incentive factoring or "adders." There is no reasonable process, however, that can even begin to create a level competitive playing field between PJM states. Individual state tax policy, land valuations, labor costs, and other variables simply cannot be equitably resolved.

g. In the draft Capstone Report, Cadmus used a 15-year Qualification Life (i.e., incentive term) as the base case. Is this the appropriate term for incentives determined via a competitive solicitation?

Yes.

h. New Jersey's solar incentive programs have historically been delivered via a program established by NJBPU. Should NJBPU consider instead delivering the incentives through project-specific contracts with the EDCs? Would this approach reduce financing costs for developers? Please discuss the pros and cons of both approaches, including the potential benefits of a contract filed with the Federal Energy Regulatory Commission and imputed debt considerations.

Clearly, the certainty of EDC contracts would bolster investor confidence and reduce financing costs. However, the cumulative impact of these contracts on the EDC balance sheets could create a host of other problems associated with skewing the debt / equity ratio maintained by utilities then creating higher ratepayer utility costs. We suggest that these incentives might better be handled through the development of a non-by passable wires charge that can be passed through as an expense. Naturally, this approach would likely require state enabling legislation.

4) How can NJBPU prevent queue siting or speculative project bids? In other words, what maturity requirements should NJBPU implement? Please consider, for example, minimum bidding requirements, escrow payments, etc. Should NJBPU require different maturity requirements for projects entering the competitive solicitation process versus the administratively-set incentive levels?

In order to pre-qualify bidders, the Board should require that all bidders show evidence of prior municipal zoning approval, site control, and completion of both the PJM required Feasibility Study and System Impact Studies. Evidence of these important and costly milestones would appear to preclude the requirement of also posting escrow payments beyond the current statutory

requirements. Clearly, the size and scope of projects bidding into the competitive solicitation would require longer maturity requirements than smaller net metered administratively set projects.

5) The draft Capstone Report recommends that NJBPU maintain flexibility in program design, in order to respond to changing market circumstances and enable the integration of emerging technologies and new solar business models.

a. Generally, how can this flexibility be incorporated into the design of the Successor Program?

Every three years during the reevaluation period, new technologies can be introduced in the context of new "factored" market segments as may be appropriate, and changing market circumstances can be integrated into the overall program at that time as well.

b. How should change in the federal Investment Tax Credit or carbon-pricing policies be incorporated into future incentive level resets?

Future changes in federal policies should be incorporated into the incentive calculations as soon as practicable for future projects based upon a date certain. Previously approved projects were financed on the basis of federal policies in existence at the time and these incentives should be locked at those levels. Otherwise, the resulting lender uncertainty will further drive up financing costs contrary to the interests of ratepayers.

c. How should NJBPU account for potential changes to the PJM and FERC regulatory structures and capacity markets?

See above, substantial changes in the capacity market and other regulatory structures should be factored into the prospective incentive structure based upon a date certain that recognizes the needs of long lead time project development.

6) The draft Capstone Report includes a SAM case for out-of-state utility-scale solar. Should NJBPU provide incentives to out-of-state utility solar through the Successor Program? If so, how, and under what conditions?

No, other than the application of Class I renewable energy credits to out-of-state projects, there would appear no reason to create additional incentives in order to create even more out-of-state jobs at New Jersey ratepayer expense.

a. The Energy Master Plan found that out-of-state utility scale resources deliverable to New Jersey are part of the least-cost path to reaching 100% clean energy. Do you agree or disagree that such projects should be eligible to participate in New Jersey's solar program?

No. Out-of-state utility scale solar resources should only be permitted to satisfy New Jersey's requirement for Class I renewable energy credits. The creation of any additional solar incentives to participate will simply shift New Jersey clean energy jobs to Western PJM states that have far lower cost profiles for solar project development. Successor program utility scale solicitations

should be open to New Jersey sited projects only, connected to a New Jersey EDC facility at any voltage level.

b. Please address any commerce clause or other legal issues associated with restricting the ability of out-of-state utility-scale projects to compete in the competitive solicitation.

Providing out-of-state utility scale projects with class I renewable energy credits toward New Jersey's class I goals should be the only financial support provided to out-of-state PJM solar projects. They should not be provided access to any competitive solicitation with additional incentives for projects to be constructed in New Jersey. Eligibility to the New Jersey program should continue to be based upon an "in-state direct connection" to a New Jersey EDC's, distribution, sub-transmission, or transmission system.

c. Should NJBPU require that such projects respect transmission limits into New Jersey? If so, how should such a requirement be designed?

Not applicable.

d. Should NJBPU require that such projects sell their energy into New Jersey (i.e., deliver into a New Jersey EDC service territory)? If so, how should such a requirement be designed?

Not applicable.

Topic 2: Modeling

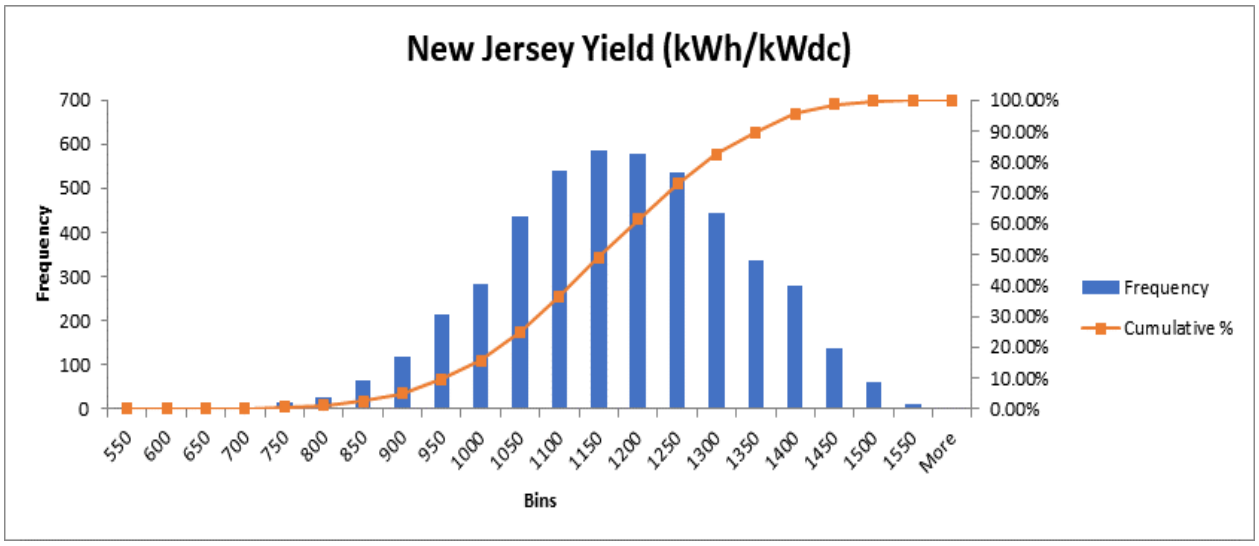
Overarching Comments Modeling Metrics

If all of New Jersey's current solar projects were individually mapped to the inputs required of the Capstone model (and it were even possible to do so), we would likely see that each of the required inputs could be "curve-fit" into a series of normal distribution functions with varying standard deviations. The Capstone model falls short, not in the comprehensive nature of its inclusion of varying and needed data, but in its inability to incorporate this uncertainty into the modeling outputs in order to provide more realistic "real world" projections. Clearly, convolving a series of arguably accurate data points together in the modeling magnifies inaccuracies. While there are a number of software products that can incorporate distribution modeling for major inputs such as installed costs, we would recommend at this point in the process that installed cost modeling be increased to the 70th percentile to better reflect the fact that the New Jersey solar market has been picked over a number of times and that new installations are far more likely to be at a higher installed cost than legacy installations.

We hope that the workshop process going forward can incorporate "uncertainty" modeling as a more accurate means of reflecting "real world" projections into the incentive modeling calculations.

The following metrics reflect NJSEC member input to the modeling assumptions deemed critical to the ultimate success of the Successor Program and Capstone Modeling effort:

- The solar industry uniformly calculates project internal rate of return on an unlevered basis. We recommend, therefore, that the modeling output reflect and unlevered rate of return of between 7.5% and 8%.
- The assumption associated with the flat 15% discount on all bill credits is simply not reflective of experientially driven customer expectations of New Jersey's current solar marketplace. Over the past decade, market segments have developed around widely varying customer savings expectations. Most residential customers expect to save in the 20%-25% range with escalators, commercial and industrial customers look for solid 25% reductions with minimal (1%) or no escalators, and schools and other public facilities demand far higher discounts. We recommend therefore that residential discounts be modeled in the 20% to 25% range and that commercial and industrial discounts be modeled at 25%.
- Escalation rates for residential projects can reasonably be set at 2.5%. C&I projects, however, rarely include significant escalators above 1%, and should be modeled accordingly.
- Residential modeling reflecting PSE&G tariff rates, should also be modeled at JCP&L residential tariff rates, in particular, inasmuch as they are substantially lower.
- System performance modeling is high by about 10%. Actual performance is more in the 1150 MWh/MW range than the 1250 MWh/MW range used in the Cadmus modeling. NJSEC member actual system performance data is included below:



- Capital costs: residential panel prices are currently running between $0.40 and $0.45 per watt, while C&I panel prices are running between $0.30 and $0.35 per watt.
- Inverter costs for residential installations are running between $0.20 and $0.25 per watt and C&I inverter costs should be at least $0.15 per watt all inverters now required to include module level rapid shutdown at these higher prices.
- ITC should be set to 22%.
- Property tax modeling: No consideration was provided for taxable assessment for net metered ground mounted footings, net metered roof lease / ground lease valuation in assessments, nor PILOT agreements that may be required for large net metered ground

mounted arrays. New Jersey municipalities are hard pressed to increase local property taxes and every opportunity is explored to tax solar installations as a source of incremental revenue. Current law exempts business personal property (panels and invertors) but ground installed footings, fixtures, and lease payments are subject to municipal property tax assessment.

The modeling conducted by Cadmus and described in the draft Capstone Report was largely informed by the assumptions used in the Transition Incentive program modeling, updated cost data from projects in the SRP, and subsequent stakeholder engagement such as the March 2020 Successor Program cost survey. Staff is interested in stakeholder feedback on Cadmus' assumptions and modeling choices. Staff has identified a number of specific questions below, but encourages stakeholders to share their assessment of the model and modeling assumptions beyond the focus of these questions.

7) Is Cadmus' breakdown of SAM cases, as identified in Table 12 (p. 32), appropriate? Why or why not?
Yes.

8) Please provide feedback on Cadmus' SAM model inputs, as identified in the draft Capstone Report and the supplemental modeling spreadsheet. In particular, please provide feedback on the following assumptions:

a. Modeled system size (Table 13, p. 34). For example, how could the adoption of the 2018 building codes and subsequent changes to residential systems setback requirements impact system size?

b. Installed costs (Table 17, p. 39). What are factors that could impact installed costs moving forward? Has Cadmus correctly identified installed cost assumptions for the out-of-state solar and community solar SAM cases?

c. Financial parameters, including interest rates and loan terms (Tables 19 and 20, p. 43).

d. Revenue assumptions. In particular, please comment on the ability to quantify projects' demand charge reduction (see Cadmus' modeling note on p. 45).

> ***Modeling Note**: While the reduction of demand charges may not be certain or readily quantifiable with standalone PV, integrating energy storage systems should improve the ability to manage demand charges (e.g., by actively "shaving" a facility's peak demand). We welcome feedback from stakeholders regarding their experiences in incorporating demand-charge reductions in their modeling for PV projects and as part of their discussions with prospective customers, particularly in light of energy storage.*

e. Specific energy production and energy degradation rate (see Cadmus' modeling note on p. 61).

> ***Modeling Note**: Given the level of EIS' "aged" SEP for the fleet relative to SEPs derived in SAM for the Successor Program Model, it may be that SAM modeling has an overall energy degradation rate higher than assumed, or additional adjustments should be made to SAM default losses, which would reduce the initial SEPs. A reduction in starting SEPs and/or an increased energy degradation rate would reduce overall energy production and suggests, therefore, that higher incentives would be needed.*

f. Investment Tax Credit ("ITC"). Should NJBPU assume that non-residential projects are able to safe harbor under the 2020 ITC at 26% (similar to the approach adopted in 2019 for the Transition Incentive Program)?

9) Do you agree with Cadmus' derivation of wholesale and energy prices, as presented in Table 21 (p. 46)? If not, how would you recommend modifying Cadmus' approach?

10) Cadmus provided different approaches to modeling the MW targets (see section 4.3, p. 50 - 56). How should NJBPU set the MW targets, while maintaining compliance with the legislative cost caps?

11) Cadmus recommends that NJBPU consider whether to differentiate treatment between direct-owned ("DO") projects and third-party owned ("TPO") projects. Please comment.

12) Please comment on the transparency and replicability of Cadmus' incentive modeling: if NJBPU were to implement an administratively determined incentive, could this model serve as the basis for setting the incentive value going forward? If not, what changes would need to be made to make it suitable?

Unlevered IRR should form the basis of evaluation.

13) Please provide general feedback on Cadmus's modeling inputs, methodology, and assumptions not already addressed in a previous question.

Respectfully submitted,

Fred DeSanti, P.E.
Executive Director, New Jersey Solar Energy Coalition