



NanoPV Solar

June 4, 2021
Princeton, New Jersey

To

STATE OF NEW JERSEY
Board of Public Utilities
44 South Clinton Avenue, 9 th Floor
Post Office Box 350
Trenton, New Jersey 08625-0350

SUB: "FY22 CRA, Budget and Program Plans."

Subject: Need for plans to benefit NJ Solar industry, Solar manufacturing and the rate payers

These comments are in addition to our "Comments regarding Docket No. QO20020184, Solar Successor Program,"

By NanoPV Solar Inc., & Dr. Anna Selvan John

Dear Sir/Madam,

We would like to submit our comments for FY22 CRA, Budget and Program Plans and for the Solar Incentive Program as follows.

NanoPV Solar is a NJ solar manufacturing and technology company that provides process and solar cell and module manufacturing and system solutions since 2005.

General Comments:

NanoPV applauds the incentives principles and the state's RPS. Particularly, the plans are to;

1. Provide maximum benefit to ratepayers at the lowest cost;





NanoPV Solar

2. Support *the continued growth of the solar industry*;
3. Meet the Governor's commitment to 50% Class I Renewable Energy Certificates (RECs) by 2030 and 100% clean energy by 2050;

However,

It is our opinion that the proposed program **does not** take into account an effective road map that can render:

- a maximum benefit to the state's solar industry,
- any benefit to the New Jersey *solar manufacturing business and its products*

and

- broader access of the incentives to the actual rate payers.

Specific topics:

The solar Industry: The significant role of New Jersey Solar panel manufacturing

The solar industry broadly comprises of the following segments: Raw material supply, solar ingot manufacturing, solar crystal growth, wafer supply, solar cell manufacturing, solar module manufacturing, system components development (including mounting structures, inverters, cables, junction boxes), solar system installation and electrical grid connections.

Most of these industry segments do not exist in the solar industry of New Jersey. However, New Jersey has a very strong historical background, expertise and experience in solar panel manufacturing. In fact, the commercial solar cells (crystalline silicon and thin film) currently in the market were first pioneered and invented in New Jersey.

However, in spite of the vast incentive programs and substantial funding, the solar module manufacturing industry and solar components industry died in the state.

There has not been a strategic plans to grow this major solar industry sector of the state. The growth of the solar manufacturing sector in NJ will;

- reduce the actual system cost (\$/W) and energy cost (\$/kWh)
- substantially increase the local economy





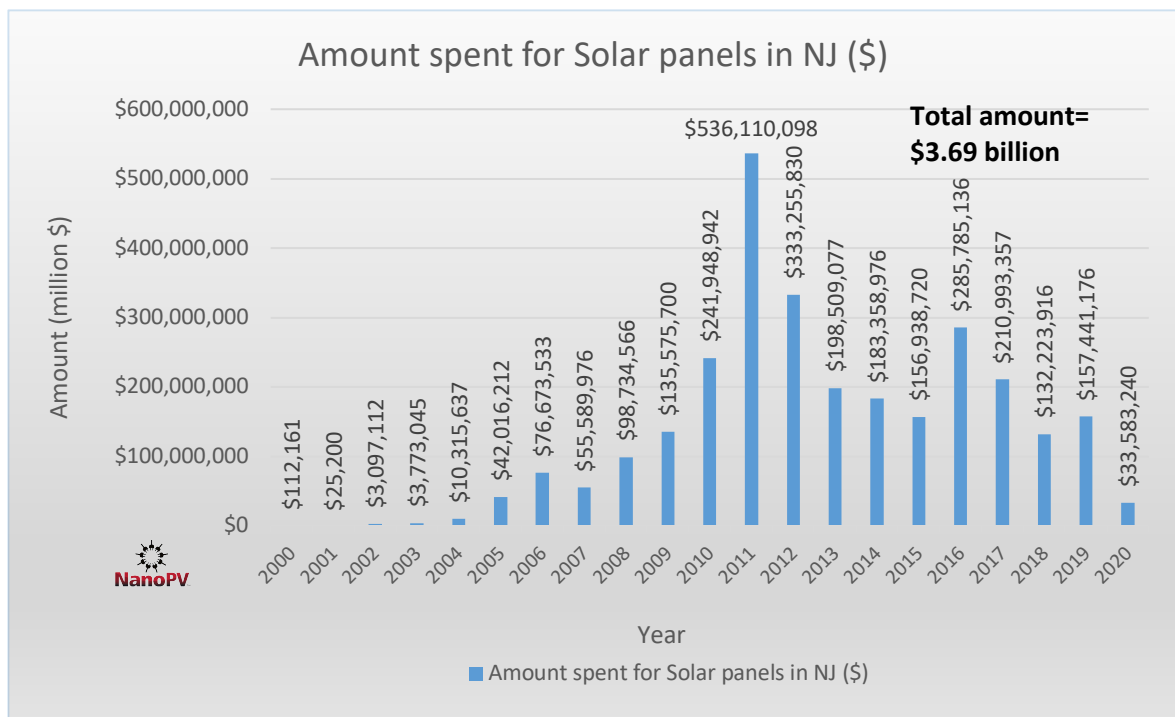
NanoPV Solar

- benefit most of the rate payers and the citizens of the state
- make NJ the world leader again in solar technology, manufacturing and supply

The current solar industry in NJ consists mainly of; Solar financiers, third party system owners, solar installers and national integrators. These sectors do not fully address the actual, complete solar industry.

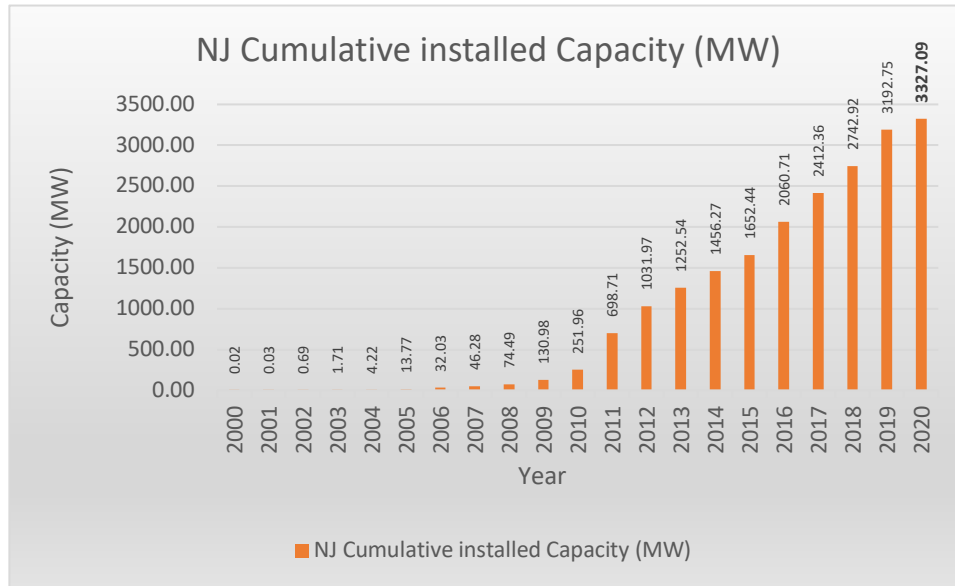
Capital Expenditure on Solar panels for New Jersey Solar projects:

Following graph shows the estimated minimum amount spent for solar modules annually for all the solar projects of NJ since the year 2000. The cost of the panels are historical values presented by various authors and organizations (Paul Maycock, Swanson, Bloomberg).





NanoPV Solar



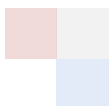
As is seen, around \$3.69 billion has been spent on solar modules for the solar projects installed in New Jersey. This is for a cumulative installed capacity of 3,327 MW.

This amount has been spent for the panels supplied from overseas Asian companies (mainly Chinese companies in China or companies owned by Chinese entities in other countries).

These expenditure for solar panels can be made well within the state if the program incentivizes the New Jersey manufactured solar panels.

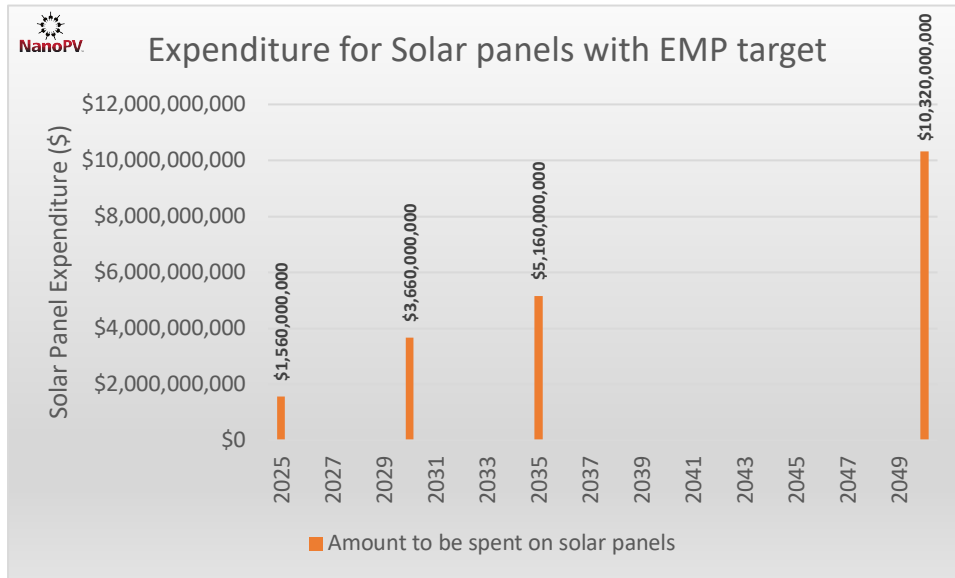
New Jersey's solar panel expenditure forecast:

To meet the Governor's commitment to 50% Class I Renewable Energy Certificates (RECs) by 2030 and 100% clean energy by 2050, there is an estimated need of 35,000 MW solar panels. The cost of the solar panels for this required capacity is estimated around \$10.3 billion in today's market value.





NanoPV Solar



Without any doubt, this amount can well be spent within the state.

The incentive programs planned for the coming years need to absolutely take these factors in to consideration

Topic : Successor Program Incentive Design

Incentive Type / Incentive Delivery Mechanism

In addition to the presented incentive types, there need to be an incentive for New Jersey manufactured solar panels.

This incentive;

-will reduce eventually the total system cost of the solar systems for the developers while substantially benefitting the economy of the state and the manufacturing job creation.

- also fits very well with the provisions of the clean energy act 2018 of New Jersey.

-will give rise to the solar panel manufacturing industry of New Jersey, which is currently *not existing*.

-also, will provide credibility, performance assurance and enforceable U.S product warranty.





NanoPV Solar

Further, the reliance on foreign solar modules during the challenging and uncertain periods, such as the one the country is currently going through, can be avoided.

Other Advantages:

The total installed capacity in NJ so far from the year 2000 is 3,327MW. The complete list of solar panels used in NJ projects is given at: www.njcleanenergy.com/renewable-energy/project-activity-reports/solar-activity-report-archive

Strikingly, it can be seen that there is no solar module manufactured in NJ was used for these large capacities of installations. It is indeed unsettling since New Jersey is the state where the current solar panel technology was invented and the current solar industry, estimated at \$140 billion/year, exists due to those inventions in New Jersey.

The average annual solar installation in New Jersey since 2010 is 304MW. The total installation of solar modules in the country in 2020 is 19.2 GW. It is estimated that less than 10% of these installations were using American manufactured solar modules. New Jersey deserves to be benefitting from such a huge national market demand. It is also an opportunity for the state due to the available, commercially proven, cost effective solar manufacturing technology and know-how. It is essential that the existing incentives are connected with the solar manufacturing. Such planning is not only going to reduce the actual cost of the solar systems but also it would improve the economy of the state as well as the number of manufacturing jobs. It is estimated that the existing demand can give rise to around 1.2 million direct solar manufacturing jobs. This can be achieved effectively by connecting the existing clean energy act and renewable portfolio standards of the state with the local manufacturing.

In addition, the local NJ manufacturing facilities can also be supplying solar panels to the international solar markets whose annual capacities are more than 145GW.

The incentive values:

The incentives can be obtained by two methods.

1. By the capacity of the NJ manufactured solar modules used for the projects. We propose the value of \$0.05/W.
2. By the units of electricity generated: The developer or the end user can receive an additional credit for using NJ manufactured panels. We propose the value of \$0.02/kWh.





Comment on III. STAFF RECOMMENDATIONS: SUCCESSOR PROGRAM INCENTIVE DESIGN
III B h

7. Project Qualification and Maturity Requirements:

1. A contract between the primary installer and the customer of record

This requirement is superfluous.

- The customer needs to have the ability to select the installer based on project financial and market capex with its own timeline. Customer may not be able to enter into a commitment at any pre-required time.

-The customer himself might be willing to integrate various components for the project with state required standards and manage the installation by himself/herself.

BPU may not get involved in installer's role in the project.

Topic : Solar Siting and new Technologies

For solar siting, the permitting for agricultural lands are “not preferred” or “not allowed”. We think the permitting considerations are very general and it does not take into consideration the salient features of certain photovoltaic technologies. There are special types of solar panel technologies and installations that can be very beneficial for the agricultural farmlands and buildings. Thereby, the zoning need to be modified based on the technology to be used.

The solar modules currently considered for the siting are viewed as if all the solar modules are using the same technology and installation. However, the solar modules can be installed in the form of green house solar structures and Agro-solar installations. The solar installation can utilize special type of solar modules that will allow the visible light to go through them while reflecting the harmful near infra-red and UV radiations away from the agricultural plants. These solar modules customized for such applications can have various transmission levels, different colors, sizes and customizable shapes. Those installations are not only environmentally friendly but also help the plants to grow very effectively.

The other type of the solar installation is Building Integrated Solar Photovoltaics (BIPV) where the solar panels can also function as the part of building element such as walls, windows and shingles etc. These panes can well integrate on existing structures without creating any code violation and environmental concerns. These types of the solar





NanoPV Solar

installation also need to be considered “preferred” even in agricultural and otherwise non-preferred locations.

These types of solar installation will lead to the effective usage of otherwise non usable solar surfaces. However, they might have higher costs due to the cost of manufacturing of such panels and the values they add to the existing structures. Thereby, additional incentives can be considered for the agricultural and BIPV type of installations.

Sincerely

Dr. Anna Selvan John

President and CEO
NanoPV Solar Inc.

103 Carnegie Center
Princeton, NJ-08540

Mail: ajohn@nano-pv.com

Phone: (609) 8513666

