

New York Solar Energy Industries Association

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Jaclyn A. Brillling, Secretary
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November 14, 2008

Dear Ms. Brillling,

These comments on **SAPA No. 03-E-0188SA18 & 19** are submitted on behalf of the members of the New York Solar Energy Industries Association (NYSEIA).

NYSEIA is a 501(c)6, not-for-profit trade association dedicated solely to advancing the use of solar energy throughout New York State. Our membership comprises nearly all solar manufacturers, distributors, and design, installation, and service companies serving New York State. These 150 companies employed about 500 full time employees statewide and generated \$75 to \$100 million in revenue in 2007. NYSEIA's membership also includes an additional 100 +/- members who are professionally involved in the solar industry through education, training, outreach, and/or advocacy. Nationally and in New York, the solar industry has been growing at 30% per year or more for the past 25 years.

NYSEIA respectfully submits these comments on **SAPA No. 03-E-0188SA18 & 19**.

Introduction: There is a common misconception that New York doesn't get enough sun and that solar power is both too expensive and too unreliable to serve NY's energy needs. The reality is quite different. In fact, from Buffalo to Broadway and from the St. Lawrence Seaway to Montauk Point, solar electric PV power and solar thermal power systems can lower the cost of energy in NYS, eliminate blackouts, strengthen the electric grid, clean the air and jump start NY's economic might with good, 21st century jobs. Right now, in spite of possessing a surprisingly strong solar resource, NYS is behind other states and even other countries. However, NY still has time to act, through sound government policy that leverages private sector investment, and become one of the world's leading manufacturers of and markets for solar energy, in all of its forms, but especially in the area of photovoltaics.

First, PV power plants can be deployed on short notice with decision-to-turnkey operation spanning at most a few months. Although PV have been used, and continue to be used to provide remote power generation, where the power grid does not reach, the great majority of PV systems are now designed to be grid interactive, producing high quality electricity and injecting it to the grid via inverters. PV generation could also be coupled with built-in storage and backup for efficient load management functionality and for maintaining critical loads during emergencies.

There are many different PV technologies evolving today with exciting prospects – the bulk of the production today, roughly 90%, is derived from crystalline silicon which currently delivers the highest conversion efficiency (now exceeding 20% from sun to electricity) and which has a very long operating life (25-year manufacturer warranties are common place). Other so-called thin film technologies, amorphous silicon, CIGS, etc. are experiencing a very fast growth. These technologies are less expensive but not as efficient. The worldwide production of PV in 2007 reached 3,700 MW, averaging a growth rate of more than 40% during the last 11 years. Projecting a similar “business as usual”, growth in the future, the worldwide production of PV could exceed 300,000 MW by 2020, (i.e., delivering annually the peaking capacity of 300 nuclear power plants). Many analysts estimate that with such a growth rate, over half of the new electrical generation capacity installed annually in the US in 2025 will be PV.

Conversion efficiencies are on a steady increase, with over 20% conversion modules available commercially today – i.e. a 1000 ft.² residential roof located in upstate New York could pack in 18 kW of power generation, producing over 2,000 kWh per month, that is, well over the typical household consumption.

NYSEIA Comments on specific questions contained in **SAPA No. 03-E-0188SA18 & 19**:

- 1. The Commission is considering whether to adopt, modify or reject, in whole or in part, potential modifications to the RPS to increase the target level of PV in high cost areas:** Yes, the Commission should modify the RPS target for PV in the high cost areas of the state. The PV allocation for the high cost areas should be increased significantly to 2,000 MW or higher. This is due to a number of factors. First, the work performed by Dr. Richard Perez, et. al. of the State University of NY shows that PV generation is highly correlated to peak power demands in the high cost areas of NYS. Since peak power purchase prices are extremely expensive, PV deployed in these locations will positively affect utility costs and there by save ratepayers money. Second, the high cost areas are also vulnerable to voltage reductions and black outs. Third, the commission should also recognize the unique value of Building Integrated PV (BIPV) applications, especially but not limited to the high construction cost, high value, load pocket areas of NYC and Long Island.
- 2. The Commission is considering whether the RPS tier allocations should be modified or a new tier created to increase the target level of PV in high cost areas.** Ultimately, it does not matter whether the existing tiers are modified or a new tier created. The key decision is to capture the energy, utility grid, economic and environmental benefits that a massive PV incentive program would deliver to the ratepayers and taxpayers of New York. NYS’s grid system is capable of utilizing and would benefit from the deployment of 6,000 MW of PV power without the need for storage. This will reduce peak purchase power costs, reduce the state’s vulnerability to black outs, reduce rates and customer bills. Further, as documented in a recent study by Barclay’s, PV energy systems generate more jobs per kWh than any other energy technology. This will be vital to rebuilding the job base of NY’s economy. Also, since the sun is a reliable performer on a month to month basis, investments in PV are very safe.

While this goal may seem lofty, the reality is that Germany – which has the solar resource equivalent of Juneau, Alaska – installed 1.3 GW of PV in 2007. This is

greater than the capacity equivalent of one of the Indian Point nuclear facilities. In 2007, 80% of the 1,300 MW – over 1 GW in total capacity – consisted of systems under 100 kW in size. Further, half of these systems – over 500 MW in total capacity – were systems of less than 10 kW in size. This deployment profile is, by definition, distributed generation that will strengthen the grid and NYS’ economy, especially in terms of job growth.

3. The Commission is considering whether the annual targets and schedule of collections should be modified to account for such changes to the RPS program.

As discussed above, the annual targets should be increased as a strategy to strengthen NY’s grid infrastructure, reduce ratepayer costs and invest in our state’s economic future. It has been shown by Dr. Richard Perez that **6,000 MW of PV** could be deployed in New York State (~20% of the State’s generating capacity) to serve this high value/local generation/grid decongestion objective. It must be stressed that New York, because of its electrical demand profile, is probably one of the best places in the country and the world to take advantage of this capability.

HOW MUCH PV IN NEW YORK AND HOW SOON?

6000 MW of high value “peak shaving” PV: As shown above, the solar resource in New York shows that it is quasi limitless. However its actual deployment will depend on the value it brings to the table and the ability of the power grid to absorb it effectively.

Like other renewables, such as wind, solar energy is an intermittent energy resource that cannot be controlled at will nor dispatched by utility operators. However, unlike these other renewables, solar is reliably available at times of peak power demand in New York State. This is because peak electrical demand in the large cities of the State is driven by air conditioning demand, and because air conditioning demand peaks are fed by heat waves which are themselves driven by solar gain. Hence the resource that creates the high power demand can also be used to serve that demand via PV generation. This attribute is often referred to as **“PV peak shaving”**

Figure 1 illustrates this capability by comparing the load of New York City on its 2006 peak day to what it would have been, had 1000 MW of PV been deployed in the city. On that day, the city experienced rolling blackouts in the borough of Queens when the demand was reaching its peak in mid afternoon. Local

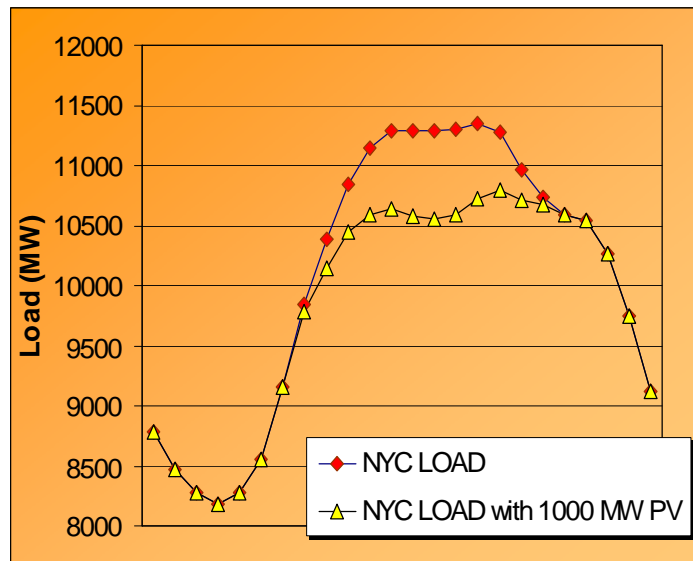


Figure 1: Peak Day New York City electric Load without PV and with a hypothetical 1,000 MW distributed over its grid.

Local

deployment of PV generation would have reduced that peak demand, relieved local stress and likely the prevented the rolling blackouts.

Combining this capability with the fact that PV plants can be deployed near the center of electrical load pockets, confers to PV generation the ability to not only displace the highest priced and dirtiest peak electricity generation, but also to reduce the need for infrastructure upgrade, by reducing load center power flows, and to enhance the overall security and resiliency of the power grid.

How soon this deployment will happen largely depends on the will of New York stakeholders (rate payers, tax payers and utilities) to see it happen – see economic discussion below.

From a purely physical standpoint, the benefits would be immediate with respect to:

- Displacing High Priced Transmission Investments: In looking at potential solutions to our multi-faceted energy challenge, many people offer nuclear power, or even large wind farms as a response. The problem with this strategy is that it requires investment not only in the power station but also in large, new, costly and generally unwanted electric transmission lines to carry the power to the point of use. The inherent value of PV electricity in NYS and many other places is that it generates electric power at the point where electricity is consumed and at the time of the utility peak, thereby displacing the need to invest in transmission lines that would only be needed for a few hours each year to serve peak loads. By combining its peak shaving and localized production attributes, PV deployment would yield power grid decongestion. This allows utility planners to minimize or postpone the need for costly, limited use investments in transmission and distribution upgrades. In this important way, solar PV power is unlike most other energy resources that would have to be piped into load pockets
- Security and Resiliency: Having dispersed localized resources near the points of use that can relieve highest stress is an important security asset. In addition to stress relief, security would be enhanced by having multiple modular units whose individual failures would never endanger the system as a whole – unlike the failure of a large power line, or that of a large power plant. Many generalized power grid failures are caused by high-demand induced stresses coincides with a strong probability of high solar resource. The analysis of the massive 2003 power blackout¹ in New York and Toronto showed that even a modest solar resource (less than 500 MW) dispersed around the large cities of the northeast would have averted the heat wave -driven outage at a small fraction of its cost by reducing the northeast electric power grid's demand, which at the time of the outage had to import over 7,000 MW through overburdened power lines: localized PV generation would have prevented every single successive failure that fed into each other and resulted in the blackout cascade. In addition to passively enhancing grid security, it is also possible to envision active security for dispersed PV generation whereby PV installations large and small, residential and commercial, could easily be designed to operate with localized storage and backup so as to be able to operate in emergency

¹ Blackout study, Perez et al.

mode when the grid goes down for any reason: be it grid stress, severe weather, or terrorism.

Long term, high PV penetration beyond 6,000MW: Beyond the high-value peak shaving opportunity, high PV penetration will require storage and infrastructure upgrade. Thus, solar development will have to go hand-in-hand with the development of smart grids and energy demand management practices as well as with the development of storage technologies. No breakthroughs are necessary to carry such a plan to fruition, just a determined effort to enhance already highly evolved approaches. The storage panoplies which will have to be developed will range for very short term (capacitors, fly wheels, batteries, load demand response) to mid term (e.g., interactive electric/hybrid cars load/backup management), to long term (e.g., flow batteries, hydrogen, compressed air). Note again that Germany, far ahead of us in terms of deployment, is facing this reality today because it cannot exploit PV peak shaving as New York could. Therefore, Germany is fast becoming an expert at developing the appropriate solutions to large scale PV penetration. It is probable they will subsequently market these solutions to us.

Given the size of the solar resource compared to all alternatives, logic alone would say that for the long term, even in cloudy New York, solar energy penetration may well be in excess of 50%. It may be early to fully envision such penetration level, but two broad avenues may be envisaged:

- Decentralized – dispersed generation, consisting largely of PV deployed within or near load centers, with local energy management/storage.
- Centralized generation in the planet’s sunny regions – both CSP and PV – with large power plants feeding load centers via long distance super-grids. For instance, resources deployed in the US Southwest could feed the US northeast load centers, taking advantage of weather and time shift differences. Another long-term option would be to float PV on part of the nation’s man made hydropower lakes where transmission already exists, and whose combined areas would be much more than enough to generate the nation’s entire electrical needs.

COST & VALUE

Fundamental Value of Solar Energy: Before delving into the short term economic value of solar deployment, it is a good idea to take a step back and look at the long term economic soundness of solar energy. This long term soundness can be simply expressed by one fundamental reality: solar technologies have an energy payback of 4-5 years today and are constantly improving. Therefore, when operated under average conditions these technologies will produce more energy in a few years than is used to construct and install them. With operational lifetimes far exceeding their energy pay-back period, these technologies are, in effect, *energy breeders* capable of powering themselves into growth for the long term. This is unlike any of the finite resources for which the long term outlook is bleak despite apparently attractive short term economics.

Short Term Economic Realities: The economic reality of PV deployment today is summarized in Table 1. The turnkey cost of a PV installation in 2008 in New York is of the order of \$8/Watt. Without incentives, the life-cycle breakeven energy value produced by a PV system would have to be more than 50 cents per kWh, i.e., considerably higher than the current retail price of electricity and almost an order of magnitude higher than

wholesale prices achieved with the current New York generation mix of hydro, nuclear, gas and coal. Using the measure of simple payback as a yardstick, it would take almost 100 year for an unincientized grid-connected PV power plant competing with conventional, polluting generation to pay for itself. The economic assessment of PV often stops at this point, with an out-of-hand dismissal.

Looking deeper into table 1 reveals a different picture. First, with incentives available today in New York, small installations (40 kW and less) would break even at 15-20 cents per kWh, i.e., very close to the current electricity retail range, particularly downstate. Because the PV technology can effectively be deployed on the retail side, PV can already be an economically attractive option today for such installations. This breakeven cost is still substantially higher than wholesale generation. However, a recent study commissioned by the NYSEIA and the Solar Alliance² shows that, because PV generates power at times of greatest need, it can capture a wholesale value substantially higher than the average wholesale generation price.

Most experts believe that by 2015, PV turnkey costs will be well within the \$3-\$5 per Watt range. In fact this price range has already been reached in the large Japanese market, and for large, multi-megawatt PV installations recently bid in California. No technological breakthrough will be needed to reach this price range, just a combination of the following factors: an easing of the silicon shortage resulting from the massive current silicon manufacturing build-up worldwide, some supply-demand relief in the hottest markets on the demand side resulting from a leveling of subsidies in maturing markets and from the sustained PV manufacturing growth currently nearing 50% per year. Longer terms prospects (2020-25) call for turnkey system costs at in the range of \$2-3/Watt.

By 2015 the breakeven cost of PV generation will be respectively 25 cents per kWh without incentives and 8-12 cents with current incentives, and respectively 15 cents and 6-9 cents by 2025, bringing PV substantially below retail rates, even without incentives and close to the present wholesale range.

Two key questions arise:

- (1) What will the retail rates be in 2015 and 2025?
- (2) What will the incentives be and how will they be justified?

The two are closely linked because incentives have been implemented to level the playing field, i.e., to account for the fact that the rates at which electricity is bought and sold today do not yet reflect all the costs involved and all the value PV would bring to the table both from a utility and a ratepayer/taxpayer standpoint.

For the utilities, the unaccounted PV value and generation costs are:

- Transmission & Distribution capacity deferral value (because PV provides stress reduction on the power grid at peak time, reducing wear and tear and postponing needed upgrades)
- Loss savings (because of reduced energy transmission losses by producing power near point of use)

² Solar Alliance study

- Environmental compliance value (which utilities only pay today for Sox and Nox compliance, but not for green-house gas emissions -- a potentially staggering amount, once the full extent of possible damage will have been internalized)
- Fuel price hedge protection (i.e., the insurance against future commodity price increases, because the solar fuel is free and quasi-limitless – this a potentially large amount as well, given recent price trends all traceable to supply limits in face of increasing demand -- Crude oil prices has been in the news of late, but all energy generation commodities (coal, gas and nuclear fuel) have experienced considerable increase for the very same reason: high demand and finite supply. To get an idea of the rate impact, think that hedging a 5-fold energy-generating commodity price increase between now and 2030 is, alone, worth 30 cents/kWh.

For the ratepayers/tax payers the unaccounted PV value and generation costs are:

- Long-term, system-wide rate protection (from energy commodity price hedging)
- Environmental health benefits (from reduced emissions)
- Business development opportunities (job and business creation resulting from solar business development)
- Use of in-state resource and reduction of state imports
- Power grid security enhancement
- Disaster recovery
- Reduction of the need to protect conventional energy resource pathways.

These values and costs will directly or indirectly provide value to PV via sustained incentives, conventional rate increases, or other tradable such as Renewable Energy Credits or RECs where the environmental value of renewable electricity is traded independently from its strict energy value on a per kWh basis. From a PV producing standpoint, RECs are equivalent to PV preferential tariff, or feed-in tariffs, available in much of Europe today. Hence the paybacks periods reported for the foreseeable future in Table 1 are likely to be upper limits and could well be considerably shorter.

TABLE 1

	2008	2015
Turnkey Cost	\$7-8/Watt	\$3-5/Watt
Breakeven kWh cost no incentives	50 cents/kWh	25 cents per kWh
Breakeven kWh cost with incentives*	15-20 cents per kWh	8-12 cents per kWh
Retail electricity cost per kWh	10-25 cents per kWh	**
Wholesale electricity cost per kWh	5-10 cents per kWh +	**
Solar coincident wholesale cost per kWh	7-13 cents per kWh +	**
Simple pay back years no incentives (retail)	30-65 years	less than 15 years **
Simple pay back yeas with incentives (retail)	9-25 years	less than 5 years **
Simple pay back years no incentives (wholesale)	60-125 years	Less than 30 years **
Simple pay back yeas with incentives (wholesale)	20-48 years	Less tan 10 years **

* Only achievable today in New York for systems smaller than 40 kW

+ solar alliance / NYSEIA study

** we are refraining to make future rate projections, but noting that one thing is certain: current rates do not yet factor in the costs listed below very likely will at some point. Therefore the payback periods shown above constitute an upper limit and are likely to be shorter.

Cost of global warming mitigation

Allowance for future commodity cost increase from resource depletion

Cost of protecting energy supply routes

Cost of insuring power grid reliability/security for the long term

Also, the commission should modify the schedule of collections from ratepayers to transform the current incentive structure from \$/watt install cost rebate to a tariff and performance based payment system known as the feed in tariff (FIT). Over the past 3 years, Germany has installed approximately 3,000 MW of PV using the FIT incentive concept. To better align costs with value, NYSEIA's **recommendation** is to introduce a Feed-In Tariff (FIT) in New York State. A FIT could solve many of the issues the SAPA Express terms document presents.

What is A Feed-In Tariff: A Feed-In Tariff (FIT) is a utility rate agreement whereby the owners of PV systems connect those systems directly to the utility grid and receive a payment, funded by all ratepayers, for the power their systems generate and deliver to the grid. All of the power generated is delivered to the grid and then repurchased by the host site for use in the building upon which the system is located. The rate paid for the PV power placed on the grid is generally quite high and this strategy has resulted in the largest and most successful PV markets in the world.

For example, in 2006, Ontario, Canada enacted a FIT that paid 42 cents (Canadian) for each kWh generated by a PV system and delivered to the grid. Over the past 2 years, Ontario's Renewable Energy Standard Offer Program (RESOP) has exceeded all expectations - achieving an excess of 1,000 megawatts of contracted projects - surpassing the 10-year target for renewable energy in the first year of the program! This represents a potential investment of almost \$5 billion in new renewable energy supply projects.³

An even more successful result has been achieved in Germany, the pioneer of the FIT concept as a clean energy development strategy. With a solar resource equivalent to northern Maine, Germany is installing more than 1,000 MW of PV each year. This is greater than the capacity equivalent of one of the Indian Point nuclear plants and by this time in 2009, Germany will have installed more PV capacity than all of the Indian Point plants combined. And while this represents more than a 10 fold increase in the PV deployment success of California, the cost of Germany's success has been achieved at a fraction of the cost/kWh from the rebate approach used in California. Germany's FIT is

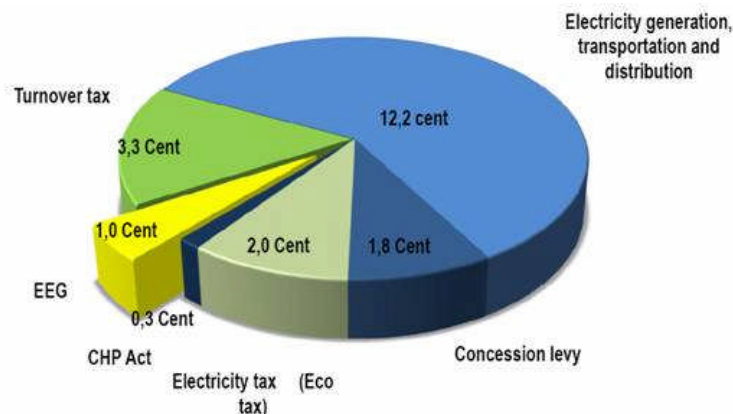


Fig. 10: Negligible Rate Impacts of FIT on German Utility Bills⁴

³ Ontario Power Authority Website:

<http://www.powerauthority.on.ca/sop/Page.asp?PageID=122&ContentID=6555&SiteNodeID=412>

⁴ Courtesy of German Renewable Energy Association DENA, www.dena.de

codified in law. As a result, the assured availability of a feed-in tariff allows the German banking industry to collateralize the FIT revenue stream, ensuring access to capital needed to buy and install the systems.

The diagram above provides a breakdown of cost components required to provide one kWh of electricity to a typical residential utility customer in Germany. First, the total rate per kWh was 20.7 Euro-cents in 2007. The portion of the German FIT is 1 Euro-cent per kWh or just under 5% of the costs for a kWh of household electricity in 2007. In 2007, the cost of Germany's FIT to the average household with an electricity consumption of 3,500 kWh per annum was around 3 Euro per month.

However, what is not presented here is the fact that the PV power that was delivered to the German grid was displacing even more expensive power and ultimately results in a net savings to the typical German family. Here's how this works.

As in the NYISO, the market price of electricity in Germany is determined by the most expensive power station still needed to satisfy the demand for electricity (merit order). Because priority is given to FIT-generated PV energy, demand for conventional electricity is reduced. As a result, the most expensive power plants are no longer needed to meet demand, and the market price falls accordingly. This effect is also known as the merit order effect. As the market price is the most important price indicator for the electricity market as a whole, the FIT therefore not only leads to considerable price reductions on the market, but should also lead to savings for all customers. This effect has been quantified on the basis of a detailed electricity market model (PowerACE) used by the German government.⁵ Further, the implementation of the FIT in Germany has allowed German industry to take a dominant role in the manufacture of PV technology, resulting job growth and cost savings. Spain offers a similar tariff and is now quickly establishing its leadership position in this global marketplace.

California also offers a feed-in tariff, though it differs from the similarly named "feed-in tariffs" in Germany and Spain. The European model includes an incentive payment for PV generation. Under the feed-in tariffs in California, customers are paid for the cost of generation based on the value of electrical generation to the grid at the time it is generated, but is not intended to embed a subsidy or rebate in the price offering.

The California FIT allows eligible customer-generators to enter into 10-, 15-, or 20-year standard contracts with their utilities to sell the electricity produced by small renewable energy systems – up to 1.5 megawatt (MW) -- at time-differentiated market-based prices. The price paid will be based on the CPUC's market price referent (MPR). Time-of-use adjustments will be applied by each utility and will reflect the increased value of the electricity to the utility during peak periods and its lesser value during off-peak periods. A special, higher-level rate is provided for solar electricity generated between 8 a.m. and 6 p.m.

⁵ August 08 Email Interview, Christina Heldwein of the German Renewable Energy Association (DENA)

OTHER BENEFITS TO A NY FIT: A FIT pays the customer/producer some multiple of the retail electric rate for renewable electricity produced. Higher FIT rates could be made available for systems installed in load pockets, in areas where construction/land costs are greater and for BIPV applications. For ratepayers, the FIT incentivizes the customer as power is produced over time instead of all up front. Being a value-based incentive over time, it is easier for the rate payers to finance than an up-front, buy-down. For customers who need up front capital to pay the cost of a PV system, loans could be offered the customer. These loans – which would be very secure and serve to open the lending activity that is so badly needed now in our financial system – could be offered through local banks, through the NYSERDA Energy Smart Loan Fund, by the local Utility or installers via financial institutions. The FIT rate should be calculated so the customer's loan payments and cost of electricity would be such that he/she could realize an immediate net positive cash flow the moment the system goes into operation. The tariff rate should also be balanced by the value of the energy generated to rate payers in different regions. Given the proven correlation between peak power and peak sunshine for generating electricity, it is clear that the PSC should target load pockets with a higher FIT rate. The FIT is simpler to implement than a buy down incentive and thus reduce paper work. A FIT automatically eliminates the need for extensive contract review and could eliminate duplication of technical review. The technical review by the Utility Company should be sufficient. The customer would become the best enforcer for ensuring high quality installation because the more efficient the system, the more kWh will be produced and thus, the more money the customer receives. Switching to a FIT incentive from a buy down incentive, especially for residential and small commercial installations of less than 50 kW, should be done gradually not all at once. This would give the market and installers time to adjust. Initially customers could be given a choice between the two types of incentive. To the extent the FIT option is chosen your work load would be reduced. As in Germany there should be no upper limits placed on system size other than capacity of the feeder line involved (checked by the local Utility).

4. **The Commission is considering whether a targeted program to increase the level of PV in higher cost load pocket areas in the NYC metro area, including targeting of particular network locations in need of load relief, would be better administered directly by the local electric utility.** Clearly, the utility companies are best positioned to know their network. Utilities could play a role in the administration of the program by conducting an open, transparent bidding process. Utilities should not be allowed to sole source contracts to the private sector and should not be allowed to install, own or operate PV generation any more than they are allowed to own or operate fossil or nuclear generating units.
5. **The Commission is considering whether the higher acquisition cost of PV might be better financed directly by the utility as a rate base addition or in some other manner.** First, rate basing implies utility ownership of the PV resource. Since PV is a generation technology, it would be a reversal of PSC decisions since deregulation of the vertically integrated utility business model to allow utility ownership of PV systems. Further, since PV is, by definition, a distributed energy resource, there is no more need for the utilities to own the PV than there is to the utilities owning the energy efficient lighting systems that are installed at customer sites. Utilities should

be allowed to earn an incentive for the development of effective PV programs that realize high levels of rapid deployment. Finally, if utilities were to rate base PV systems, it would preclude the ability to use limited ratepayer dollars to leverage private investment and require rate payers to finance the full cost of the system.

- 6. The Commission is considering whether to adopt, modify, or reject, in whole or in part, potential modifications to the Renewable Portfolio Standard (RPS) program, including base forecast, goals, tier allocations, annual targets and schedule of collections.**

NYSEIA has no further comments on this at this time.

- 7. The Commission is considering updating the base forecast using a 2007 forecast of electricity usage in New York State developed in Case 07-M-0548, the Energy Efficiency Portfolio Standard (EEPS) proceeding.**

NYSEIA has no further comments on this at this time.

- 8. The Commission is also considering updating the base forecast using a post-EEPS forecast of electricity usage in New York State, also developed in the EEPS proceeding, incorporating successful deployment of the targeted levels of energy efficiency planned in the EEPS case into the forecast.**

NYSEIA has no further comments on this at this time.

- 9. The Commission is considering whether to increase the goal to 30% by 2015 or to otherwise adjust the goal.**

NYSEIA believes the commission should increase the goal and that the energy resource chosen to meet that goal should be based on the energy, economic, environmental and public health value delivered by those energy resources.

Conclusion: Encouraging the deployment of end-use specific solar technologies is important because direct utilization of solar energy embodies the highest operating efficiencies, and can be integrated directly with energy conservation: solar hot water production, passive solar heating and daylighting could easily be implemented in most new constructions and retrofitted in many.

However the real story for solar in New York lies with solar electricity production, because electricity is not end-use limited and can eventually be used and/or transformed to reach virtually all energy consumption sectors. In this respect the solar potential of the State of New York is very large – less than ½ % of the State’s area could generate all of the electricity consumed by the State. On a planetary scale, solar energy is the only proven resource that is both large enough and acceptable enough to carry the growing planet’s demand for the long haul.

While long term solar energy prospects are virtually limitless, large scale implementation will require the development of energy transformation and storage infrastructures (a cost, but also a large business opportunity for the State). There is however a sizable initial solar deployment opportunity (at least 6,000 megawatt worth) which would provide high value and security to the power grid, without any significant change in infrastructure; This opportunity would be targeted to mitigating summer peak loads in the cities of New York, reducing the risks of outages and the postponing the need for grid and conventional (polluting) peak generation upgrades.

Much of the value that PV would bring to New York today cannot be captured directly by PV operators – e.g., the value from displacing green house gases, displacing the emissions from summer peaking units, reducing the need for finite energy imports and building a hedge against their eventual depletion, providing transmission and distribution benefits via stress reduction, and creating more jobs per kWh than other resources. It is important that elected officials continue to provide the indirect support that makes up for this lack of accounting at the business level (via, buy-downs through NYSEERDA, tax credits depreciation and renewable energy credit trading), while noting that the most successful programs in the world have streamlined this process by removing multiple source complexities and making it simple for users and developers – in France, for instance, one only needs to connect a PV system on the power grid and receive an appropriate feed-in solar tariff bundling all high values as quantified by the country's regulators.

While the physical potential is sound and large and the attributes of solar are perfectly aligned with needs of NYS's power grid, the existing business and regulatory environment has served to discourage and prevent the installation of PV in NYS.

An updated Tracking system should be created that allows the timely tracking of onsite, customer tier renewable energy production. As noted in the Task Force Report, New York's tracking system for environmental attributes needs to be improved to be consistent with the neighboring grids. The system should be transparent and compatible with neighboring systems to enable transfers.

- **PJM and NEPOOL have excellent systems that allow for timely recognition and tracking of Environmental Attributes (within 90 days after the close of the period).** NY's Environmental Disclosure process has still not processed attributes from 2007. This can undermine the credibility of the voluntary market when customers need to wait so long to receive the attributes that they have purchased. In fact, these credits can be virtually impossible to monetize for smaller systems, rendering them valueless.

The current system is based on sales into and from the spot market. On-site generation is unlikely to participate in this program and cannot be included in this market. Neighboring pools such as PJM are investigating the tracking of verified energy reduction measures, so-called "white tags". An updated tracking system should include the ability to track renewable energy production from fossil fuel reduction measures such as solar thermal for hot water production.

Solar thermal is one of the most prevalent forms of renewable energy world wide and should be considered an eligible RPS resource. Solar thermal output worldwide is more than 77 Terawatt hours per year, second only to wind energy and 10 times greater than the 7.7 Terawatt hours of solar electric PV. Solar Thermal is an underutilized technology in New York for several factors. Government emphasis has

enabled other markets with smaller solar resources to dramatically increase the effective use of this technology.

- **Solar thermal production has a similar profile as Solar Electric PV (Photovoltaics).** There are 900,000 residential customers who use electricity to heat water (EIA, NYSERDA). With standard storage and timers, peak electric demand can be eliminated for these customers from May through October.
- **Multi-Family homes and residences are the primary users of electric hot water heaters.** NYSERDA believes that there are significant numbers of Multi-Family homes located in the New York City area that utilize electric hot water systems. The RPS could provide significant benefits to this target population.

The RPS should promote all emission-free, on-peak renewable energy, regardless of location. The on-peak pricing of electric commodity is a concern statewide. While NYC has additional congestion issues, peak price is a concern everywhere in the state.

While NYS is making progress, the reality is that key policy pillars must be addressed for the market to work. In fact, if done properly, the market will blossom. The historically hostile regulatory environment that the PV industry has faced in NYS is changing. NYS's utilities are also, slowly, coming to understand the potential business opportunities that PV represents as well as the public's favorable view of utilities that adopt solar-friendly policies. While NYS's leaders are in strong support of PV, they are also becoming more sophisticated in their understanding of the policy tools needed to achieve market success. Due to a number of factors – the size of our electric load, the relationship between peak load and available sunshine and the amount of solar energy NYS receives, NYS should be the 2nd largest market for PV in the US. Further, because of these very same factors, NYS should be one of the top 10 markets in the world. As important as this would be for the environment, it is even more important for NYS's rate payers and our NYS economy. A rapid, large scale deployment strategy could serve to drive down the cost of utility service for all customers/classes while making NYS a world leader in job growth and economic development.

Sincerely,



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