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Chairman Robert Godshall
Pennsylvania House of Representatives
Consumer Affairs Committee

Testimony of Andrew J. Kleeman related to House Bill 1580

Chairman Godshall and members of the Committee, thank you for the opportunity to share my insights with regard to House Bill 1580. As my testimony will illustrate, this is an urgent matter for the committee to consider.

My name is Andrew Kleeman. I am here today as both a board member of the state's professional organization for solar power (PA SEIA) and as a Senior Vice President at Mercury Solar Systems, Inc. ("Mercury"). Mercury is a leading east coast solar company that was, until very recently, a leading employer in Pennsylvania in the solar sector.

Over the course of my 26 year career, I have launched and grown three small businesses in our Commonwealth. These businesses have collectively employed over 200 Pennsylvanians. They have enjoyed market expansions and have endured market contractions. Through all of those cycles, I have never before felt so compelled to publicly advocate for specific Bill, but this issue is both critical and urgent.

In my testimony, I would like to address just three issues. First, I will discuss the positive impact the Pennsylvania Solar Industry has had on employment, as well as the current, dire and imminent threat to that employment. Second, I will discuss the Cost to Rate Payers of the pending Bill and illustrate its negligible impact. Lastly, I would like to briefly comment on the concept of free markets, as it relates to the Pennsylvania solar industry. My concluding point will be that House Bill 1580 is a market-based,

inexpensive, and highly cost-efficient mechanism to halt the in-progress collapse of a viable and important new industry.

Issue #1: Employment Issues:

I would like to start this point with a set of irrefutable and heretofore confidential facts that I hope you will find as stunning as I do:

In November 2007, my nascent solar company, Eos Energy Solutions, employed a total of two people – myself and a marketing intern. By November 2008, we had doubled that staff to four, and we were up to 16 by November of 2009. By November of 2010, we had merged with a regional solar leader, Mercury Solar Systems. Mercury then invested heavily in the Pennsylvania operations and our Pennsylvania head count ballooned to 42. That is 42 well compensated Pennsylvanians – more than half of whom had been unemployed or underemployed construction workers.

This tremendous employment growth was achieved during the worst economic times since the Great Depression – a period in which Pennsylvania's unemployment rate rose from 4.5% in November 2007 to 8.6% in November 2010¹

At the end of 2011, our Pennsylvania operation employed two. Forty-two to two, in just the past two quarters.

I concede that anecdotal evidence is not always indicative of larger trends. Also, I must clarify that the majority (but not all) of the 40 former Pennsylvania employees of Mercury were transferred to states with expanding markets - most notably Maryland, Massachusetts and New York. Yet even as a single data point, the data still speaks to the loss of 40 jobs and 40 tax payers in our Commonwealth. Those jobs are not coming back any time in the foreseeable future without passage of House Bill 1580.

More importantly, the Mercury experience IS indicative of what is now happening in the Pennsylvania solar industry – it is not just anecdotal. An industry that grew rapidly over the past four years is now facing an extraordinarily rapid contraction.

In my role with PASEIA, I consistently hear the chagrin of my fellow Pennsylvania solar installers. Most of these companies are based exclusively, or predominantly in Pennsylvania, They have neither the resources nor the will to reallocate their staffs to stronger solar markets in the surrounding states. It is

¹ US Bureau of Labor Statistics

my testimony that every solar company I am aware of in our Commonwealth is either contemplating or has already begun draconic staff reductions; not some, not most, but every single one.

The total number of jobs at stake is large. Exactly how many solar full time equivalent ("FTE") solar jobs there are in Pennsylvania is debatable. I believe the most definitive analysis of solar jobs is the October 2011 "National Solar Jobs Census 2011" prepared jointly by Cornell University and BW Research for the Solar Foundation. That 68 page, peer reviewed analysis places the PA Solar Jobs figure at 4,703. The full 68 page analysis is available at <http://thesolarfoundation.org/research/national-solar-jobs-census-2011>, or from myself upon request.

We did our own analysis at Mercury Solar Systems and arrived at a moderately lower figure for Pennsylvania solar employment. At our peak Pennsylvania head count of 42, we built approximately 2.6% of the new Pennsylvania solar capacity in the 12 months preceding July 1, 2011. Our head count in Pennsylvania of 42 did not include engineering, procurement, and accounting resources in our corporate offices. Nor does it include any manufacturing, distribution, subcontracted specialty trades, legal, or utility labor devoted to solar. Following common sense, and the model defined in the Cornell study, we applied a 1:1 ratio of our internal Pennsylvania headcount to total solar FTEs associated with our work. Therefore, we projected a labor force of 84 to construct 2.6% of the market, yielding a projected total Pennsylvania solar workforce of 3,230.

This simple analysis does not factor the reality that Mercury's scale and experience allow us to build systems more labor efficiently than the Pennsylvania solar industry mean. If we assume that Mercury can build systems 20% more efficiently than the industry mean, the total state wide head count number from our internal analysis approaches 4,000.

The precise number is not germane. The critical point is that Pennsylvania solar jobs number in the thousands – not the hundreds. Whether it is 3,000 jobs or 5,000 jobs, the same imperative exists to pass House Bill 1580 to prevent massive layoffs.

Issue #2: Cost to Rate Payers:

Rate Payer impact is, appropriately, a critical consideration for House Bill 1580. We are living in austere times. These days, both our state and federal governments have a heightened responsibility for fiscal prudence. And that is exactly why House Bill 1580 is the right solution to a critical problem.

As I will document below, the cost of implementing House Bill 1580 was always modest (costing the average rate payer less than a penny per day), but the most current Ross Amendments simply borrow SRECs from future years – it is a net neutral impact on costs.

As with the various projections of the size of the Pennsylvania solar labor force, projections of the original cost of implementing House Bill 1580 cover a wide range. I have included in my testimony three straight-forward and credible analyses supporting a conclusion of nominal cost to individual rate payers. The substantial majority of Pennsylvania’s four million rate payers are residential customers and each of them would be exposed to less than a penny per day of additional costs when House Bill 1580 is implemented.

The analyses are summarized in the following table, and are included as attachments to this testimony:

| Analyst | Residential Rate Payer | | Ave. C&I Rate Payer | | Total Long Term Cost |
|------------------|------------------------|---------|---------------------|---------|----------------------|
| | \$/Day | \$/Year | \$/Day | \$/Year | |
| Dayhill, 6/11 | 0.01 | 3.91 | 0.15 | 55.88 | \$165,763,724 |
| PASEIA 11/11 | < 0.01 | 1.63 | 0.06 | 22.79 | \$113,315,417 |
| PennFuture 11/11 | < 0.01 | 1.30 | Not Calculated | | \$90,782,946 |

All of these analyses follow a methodology of estimating the increased value of SAECs (“SRECs”) multiplied by the total number of SRECs to be sold in the period effected by House Bill 1580. The variances among the analysis conclusions are primarily a function of different projections in future SREC values. Among the three presented analyses, the projected future peak value of SRECs ranges from \$190 (PASEIA 11/11) to \$275 (Dayhill, 6/11), as opposed to a current spot market trading value of \$30.

Other Cost to Rate Payer analyses presented elsewhere have assumed future PA SREC values to be in excess of the \$325 Alternative Compliance Payment (“ACP”), as proposed in the amended House Bill 1580. Even rudimentary supply/demand curve analyses of the PA SREC market repudiate any projected future PA SREC value above (or near) \$300. Moreover, the proposed amendment creating a \$325 ACP is, effectively, a cap on SREC values. Subsequently, I urge the Committee to summarily reject any Cost to Rate Payer analysis which places the projected SREC value at or above \$325.

Based on the preceding Table, and the attached full analyses, I see a total potential cost to Rate Payers of \$165 million, and a more likely actual cost of \$113 million. While \$113 million is a substantial sum, it spread over more than four million Rate Payers. It may also be a smaller sum, spread over a longer period of time and, than the alternative cost (in UC benefits and loss of payroll tax revenues) of not passing House Bill 1580.

Issue #3: Free Markets:

There has been much discussion - important discussion - of free markets in the energy sector and the desire to allow the market to guide our energy choices. I support that fundamental concept, but I temper the support with the reality of our situation.

With the expiration of the Pennsylvania solar rebates and grants, House Bill 1580 is a necessary modulation to what is now, finally, a market driven solar sector. We are not seeking any tax payer dollars - we are simply seeking an adjustment to the rules under which the SREC market will function. We created the hyper growth that now threatens a market collapse. Reasonable societies do not allow avoidable fatal market crashes where so many livelihoods are at risk, and the promise of cheap power is so close at hand.

I remind the Committee that even the global icon of free markets, the New York Stock Exchange, has built-in stops and market freezes to preclude catastrophic collapses.

Our state and federal programs that gave solar a chance have been incredibly successful. The gross cost of solar power has plummeted as a direct result of short term market access allowed by a myriad of programs. We are on the cusp of the holy grail of solar: grid parity. Today, solar power already costs less, over term, with no subsidy whatsoever, than unsubsidized nuclear power or unsubsidized coal with carbon sequestration. Give us a reasonable set of corrected market rules to play by and we will continue to drive down the cost of energy for the Commonwealth.

Conclusions:

House Bill 1580 is an imperative action for this Assembly. Over 3,000 Pennsylvanians face the specter of unemployment and failed businesses if this Bill is not passed, and the great efforts this state has made to be a national leader in renewable energy will be negated. The cost of this Bill was always modest, but as recently amended, it is a net neutral.

Pennsylvanians, like the majority of Americans overwhelmingly support continued growth of the solar sector as part of our long term energy solution². Please bring 1580 to an affirmative Committee vote immediately.

Thank you

Sincerely,



Andrew Kleeman
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² Kelton Research survey between September 29 and October 6, 2011, among at least 1,000 nationally representative Americans ages 18 and over. 89% of all Americans think continued development of solar power is important. When asked if government should selectively support any type of energy development, 16% of Americans said "no", while the majority were supportive of governmental support of specific energy development initiatives. Among the majority who are in favor of government support, more favor solar than any other energy source. http://www.sela.org/ca/news_detail?pressrelease.id=1670



RATEPAYER COST IMPACT OF PA HOUSE BILL #1580

HB1580 was introduced on October 3, 2011 by Rep. Chris Ross, which now includes 109 co-sponsors as of November 10, 2011. This bill does not increase the overall solar share requirement but instead simply helps mitigate the current problem with the alternative energy credits market for solar, usually referred to as solar energy credits (SRECs).

BOTTOMELINE - This bill will cost residential customers less than ½ penny a day for only five years.

SUMMARY OF THE PROBLEM

The solar industry and its customers are currently experiencing a dramatic drop in the price of solar credits due to the lack of market demand for the credits. Because of the massive oversupply of solar credits compared to the very small requirement, the credit value has dropped over 90% in about nine months from over \$300/SREC to under \$30/SREC. This situation is getting worse and it is not going to improve for the next few years because the number of solar credits utilities are required to purchase by law is currently set too low for the number of projects in operation and those being planned. As a consequence, there is virtually no market for Pennsylvania's solar alternative energy credits which means the solar projects, as well as the overall solar workforce has virtually come to a standstill, either causing massive layoffs, closing down of businesses, or relocating businesses and jobs out of Pennsylvania.

As of November 7, 2011, Pennsylvania has 120 MW of solar PV capacity, with an additional 38 MW of PV capacity installed out of state registered in the PA Alternative Energy Portfolio Standard (AEPS) program. Below shows a graph of the current solar share requirement between reporting years (RY) 2009 and 2012, compared to the SRECs that have been generated and reported into GATS from these solar PV systems so far.

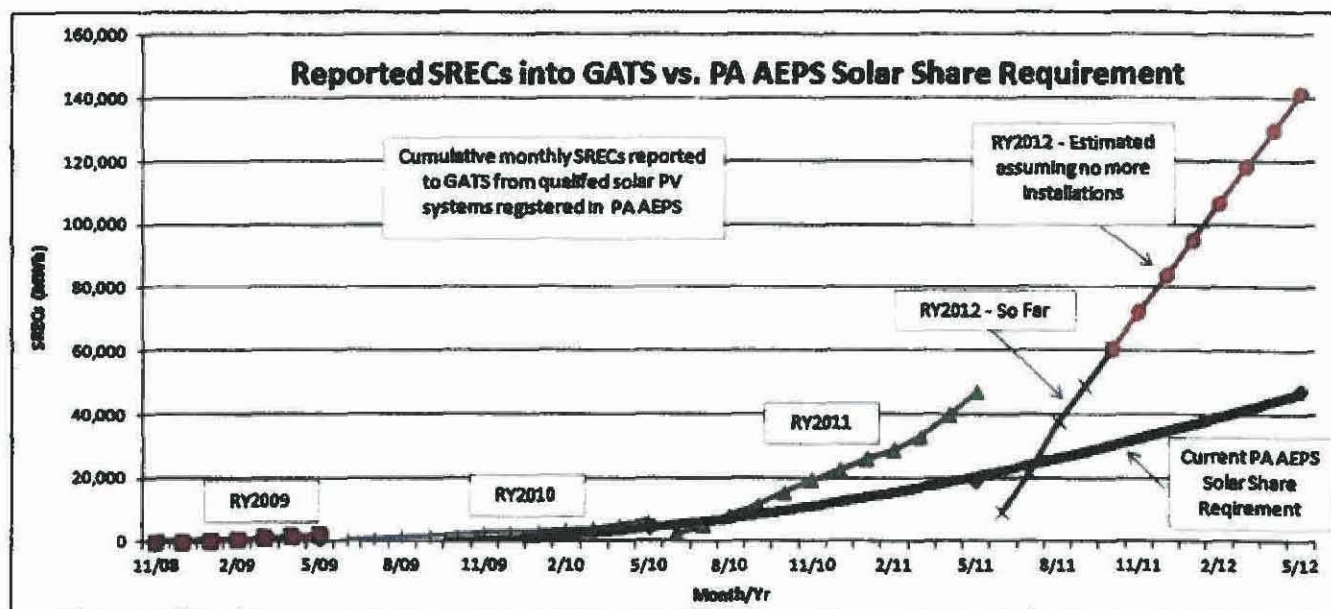


Figure 1. Reported SRECs vs Solar Share Requirement

As can be seen in Figure 1, the recent explosion of installed solar PV systems have been generating and reporting a substantial oversupply of SRECs into GATS, consequently resulting in the plummeting of SREC prices. The figure also clearly illustrates that this oversupply will remain for well into the future, if this problem is not corrected. Even if no more new solar systems register with the AEPS Program, it can be estimated by the end of RY2012 (May 31, 2012) there will be at least three times more SRECs reporting into GATS than what is required.

PROPOSED SOLUTION – HB1580

Representative Chris Ross’s HB1580 does two things:

1. Provides for a small adjustment to the solar requirement in the years 2012-2013 through 2014-2015 so the requirement more closely matches the growth in solar demand with the market. The Ross legislation will not increase the overall solar share requirement but simply moves the requirement forward.
2. Pennsylvania “borders” are currently open to out-of-state projects. This is contributing to the influx of projects from other states. Pennsylvania is the only state that accepts solar credits from any of the other 13 PJM states. Ohio also has open borders, but it is very limited. Pennsylvania ratepayers are currently supporting these out-of-state projects. The Ross legislation closes this loophole.

As described above, this bill is intended to help re-align the solar share requirement relative to the existing market of solar PV installations in Pennsylvania. This correction will allow for new solar projects, and those projects on hold, to move forward at a modest pace; otherwise, the solar industry expects that no more projects will be installed in PA for at least three years.

In this bill, the solar industry has proposed to increase the solar share requirement only for the next three years, but then continue with the existing solar share requirement percentage thereafter. The following table shows the existing and proposed solar share requirement percentages starting at 2010:

| Reporting Year | Current Solar Share Percentage | Proposed Solar Share Percentage |
|----------------|--------------------------------|---------------------------------|
| 2010 | 0.0120 | 0.0120 |
| 2011 | 0.0203 | 0.0203 |
| 2012 | 0.0325 | 0.0325 |
| 2013 | 0.0510 | 0.1500 |
| 2014 | 0.0840 | 0.1700 |
| 2015 | 0.1440 | 0.2040 |
| 2016 | 0.2500 | 0.2500 |
| 2017 | 0.2933 | 0.2933 |
| 2018 | 0.3400 | 0.3400 |
| 2019 | 0.3900 | 0.3900 |
| 2020 | 0.4433 | 0.4433 |
| 2021 | 0.5000 | 0.5000 |

Table 1. Current and Proposed Solar Share Requirement Percentages

RATEPAYER COST IMPACT

Methodology

Although HB1580 proposes a solar share requirement increase for only three years, this analysis extends out two additional two years because it is assumed the SREC pricing will take that long to reach steady state, meaning that the average SREC price will be the same by 2018 regardless whether HB1580 passes or not.

Table 2 below shows six years of the estimated current solar share requirement in SRECs for RY2013 through RY2018, as well as for the proposed HB1580 scenario. The solar requirement percentages are multiplied by the forecasted total retail electric sales in Pennsylvania, which are based on the PA PUC report, *Electric Power Outlook for Pennsylvania 2011 - 2015* (July 2011).

| Calendar Year | Reporting Year | Est. Elect. Sales MWH (RY) | Current Solar Share | | Proposed - HB1580 | |
|---------------|----------------|----------------------------|---------------------|----------------|-------------------|----------------|
| | | | Solar Share (%) | PV SRECs (MWh) | Solar Share (%) | PV SRECs (MWh) |
| 2012-2013 | 2013 | 147,429,544 | 0.0510 | 75,189 | 0.1500 | 221,144 |
| 2013-2014 | 2014 | 148,824,315 | 0.0840 | 125,012 | 0.1700 | 253,001 |
| 2014-2015 | 2015 | 150,234,430 | 0.1440 | 216,338 | 0.2040 | 306,478 |
| 2015-2016 | 2016 | 151,660,076 | 0.2500 | 379,150 | 0.2500 | 379,150 |
| 2016-2017 | 2017 | 153,101,443 | 0.2933 | 449,047 | 0.2933 | 449,047 |
| 2017-2018 | 2018 | 154,558,725 | 0.3400 | 525,500 | 0.3400 | 525,500 |

Table 2. Current and Proposed Solar Share Requirement Percentages and SRECs

Table 3 repeats the SREC requirement in both scenarios, which are multiplied by the assumed SREC prices to come up with the total costs, thus yielding the estimated total increased cost to ratepayers for HB1580.

| Reporting Year | Current Solar Share Scenario | | | Proposed HB1580 | | | Estimated Increased Cost |
|----------------|------------------------------|------------|----------------|-----------------|------------|----------------|--------------------------|
| | PV SRECs (MWh) | SREC Price | Total Cost | PV SRECs (MWh) | SREC Price | Total Cost | |
| 2013 | 75,189 | \$50 | \$ 3,759,453 | 221,144 | \$190 | \$ 42,017,420 | \$ 38,257,967 |
| 2014 | 125,012 | \$50 | \$ 6,250,621 | 253,001 | \$150 | \$ 37,950,200 | \$ 31,699,579 |
| 2015 | 216,338 | \$50 | \$ 10,816,879 | 306,478 | \$125 | \$ 38,309,780 | \$ 27,492,901 |
| 2016 | 379,150 | \$70 | \$ 26,540,513 | 379,150 | \$100 | \$ 37,915,019 | \$ 11,374,506 |
| 2017 | 449,047 | \$80 | \$ 35,923,723 | 449,047 | \$90 | \$ 40,414,188 | \$ 4,490,465 |
| 2018 | 525,500 | \$85 | \$ 44,667,471 | 525,500 | \$85 | \$ 44,667,471 | \$ - |
| Total | 1,770,235 | | \$ 127,958,661 | 2,134,320 | | \$ 241,274,078 | \$ 113,315,417 |

Table 3. Total Incremental Costs of HB1580

The assumed SREC prices for the current solar share scenario (without the passage of HB1580) are based what the oversupplied market is reflecting today. Based on feedback from several SREC aggregators and other solar professionals, as well as from SREC Trade (www.srectrade.com), Flett Exchange (www.flettexchange.com), and very recent average weighted PA SREC prices in GATS, it is assumed for this analysis the average SREC price is \$50 for the first three years, then slowly goes up to \$85 by 2018. Most of these sources indicate the current SREC price is down around \$10 to \$40, where GATS shows an average weighted price of over \$95.

However, SRECs are not selling right now, as SREC sellers are holding out towards the end of the reporting year waiting for higher prices; so it is assumed the price will probably spike a bit. As the current solar share requirement increases over the next few years and the oversupply diminishes, it is assumed the average SREC price will climb a bit more, assumingly to \$85 by 2018.

In the proposed HB1580 scenario, the average SREC price is assumed to be \$190 in RY2013, and is expected to continuously drop to \$85 by RY2018, to the same price as in the current solar share scenario. Although SREC prices in PA have been much higher in the past, there is strong agreement amongst many solar professionals that the day of the higher priced SREC is over. The passage of HB1580 will in effect bring the solar share requirement much closer to the SREC supply, consequently keeping the SREC price at bay. And as solar installation costs continue to drop, so will the average SREC prices, therefore they decline thereafter for this analysis.

Table 4 shows the cost impacts from HB1580 to the ratepayer in the form of an electric bill increase. As can be seen, the residential bill only increases less than 14 cents per month on average over the five years analyzed or *less than half a penny a day*; and under \$2 a month for commercial customers with an assumed annual electric usage of 150,000 kWh/yr.

10,716³ ← Avg Residential kWh/yr Usage
 150,000 ← Assumed Commercial kWh/yr Usage

| Reporting Year | Estimated Elect. Sales MWH (RY) | Estimated Increased Cost | Estimated Increased RIM \$/kWh | Increased Residential Cost | | Increased Commercial Cost | |
|----------------|---------------------------------|--------------------------|--------------------------------|---------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------|
| | | | | Estimated Increased Res Cost (annual) | Estimated Increased Res Cost (monthly) | Estimated Increased Comm Cost (annual) | Estimated Increased Comm Cost (monthly) |
| 2013 | 147,429,544 | \$ 38,257,967 | \$ 0.0002595 | \$ 2.78 | \$ 0.23 | \$ 38.93 | \$ 3.24 |
| 2014 | 148,824,315 | \$ 31,699,579 | \$ 0.0002130 | \$ 2.28 | \$ 0.19 | \$ 31.95 | \$ 2.66 |
| 2015 | 150,234,430 | \$ 27,492,901 | \$ 0.0001830 | \$ 1.96 | \$ 0.16 | \$ 27.45 | \$ 2.29 |
| 2016 | 151,660,076 | \$ 11,374,506 | \$ 0.0000750 | \$ 0.80 | \$ 0.07 | \$ 11.25 | \$ 0.94 |
| 2017 | 153,101,443 | \$ 4,490,485 | \$ 0.0000293 | \$ 0.31 | \$ 0.03 | \$ 4.40 | \$ 0.37 |
| 2018 | 154,558,725 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Total | | \$ 113,315,417 | | \$ 8.14 | \$ 0.68 | \$ 113.97 | \$ 9.50 |
| Average | | | \$ 0.0001520 | \$ 1.63 | \$ 0.14 | \$ 22.79 | \$ 1.90 |

Table 4. Increased Costs in Ratepayer Electric Bills

The unitary cost (\$/kWh) is calculated by dividing the total incremental cost by the total electric sales in PA; this is then multiplied by the average residential household electric usage in Pennsylvania, that being 10,716 kWh/yr (based on PA PUC report Electric Power Outlook for Pennsylvania 2010 - 2015 (July 2011)). The commercial customer example represents an assumed small to medium sized commercial customer. It is worth noting that these are pre-tax costs, so for-profit commercial and industrial customers will pay much less than these estimates based on their effective tax rate (ETR).