Pennsylvania SREC Market Update

May 29, 2018

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ACT 40 OF 2017

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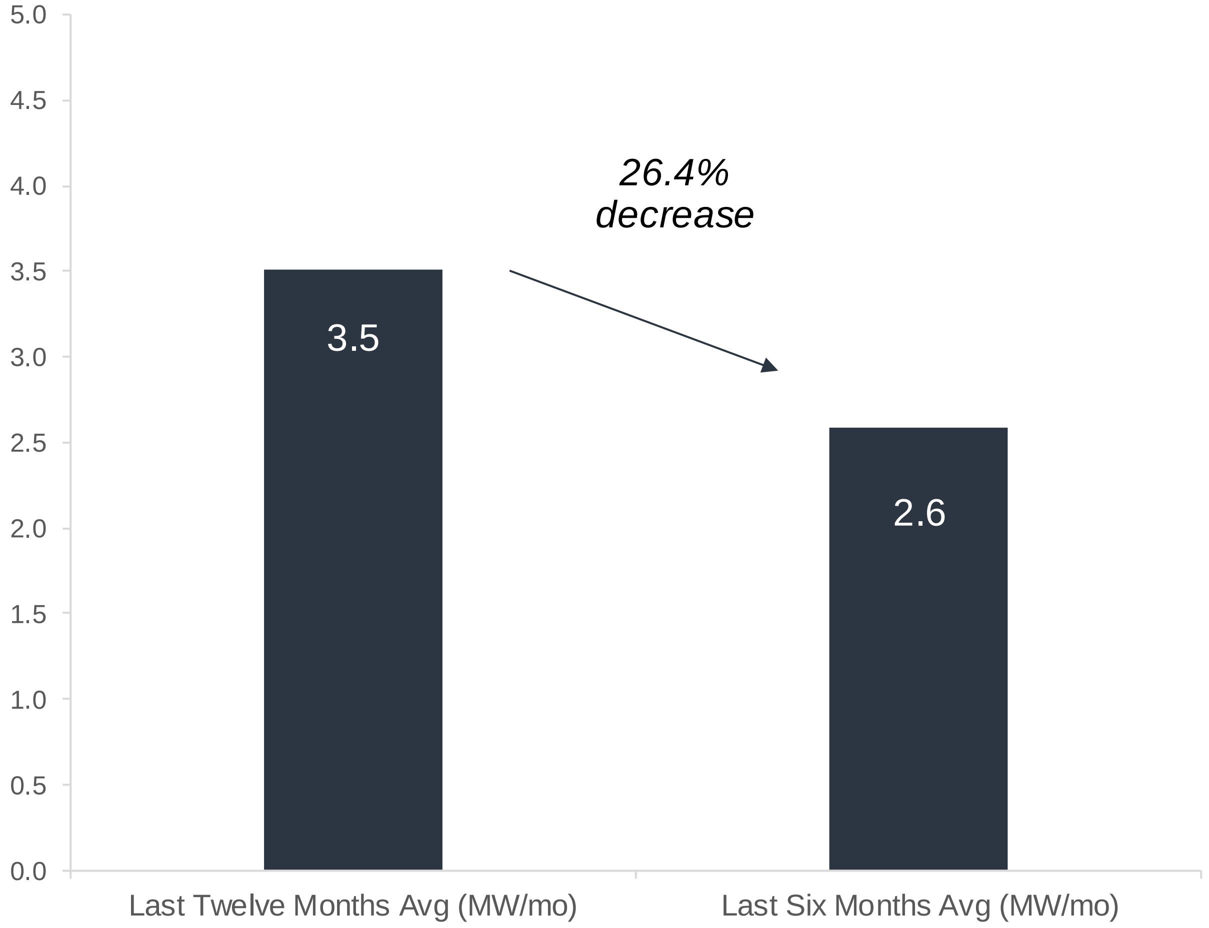
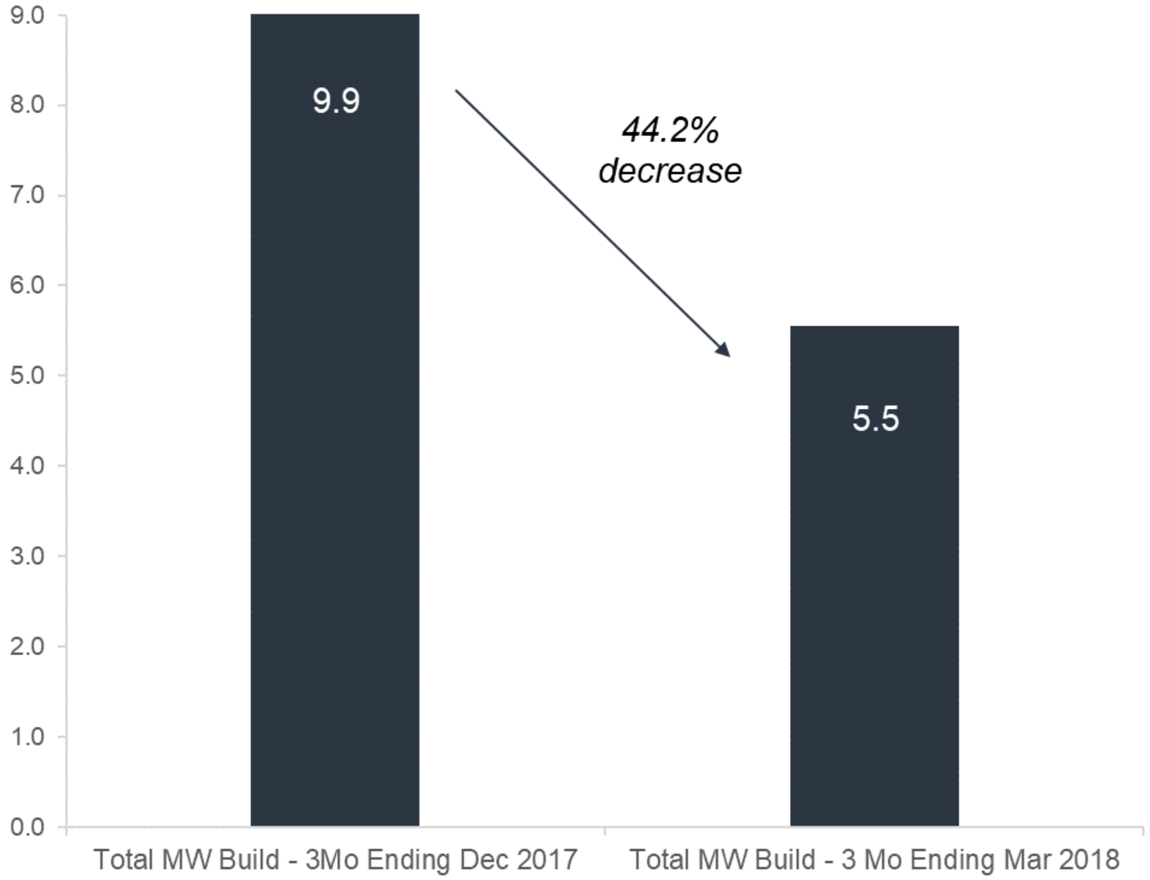
- April 19, 2018, the Pennsylvania Public Utilities Commission (PUC) issued Final Implementation Order of Act 40 of 2017
- The Order clarified the PUC's interpretations of Section 2804(2)(i) and Section 2804(2)(ii) which are as follows:
- Section 2804(2)(i) – *"[a] certification originating within the geographical boundaries of this Commonwealth…" shall mean a facility located within PA having received an AEPS Tier I solar photovoltaic certification.*
- Section 2804(2)(ii) – *shall only permit out-of-state facilities that are 1) already certified as AEPS Tier I Solar Photovoltaic and 2) entered into an SREC contract with a PA electric distribution company (EDC) or electric generation supplier (EGS) serving PA customers to maintain certification until the expiration of the contract.*
- On May 3, 2018, the PA PUC entered its final implementation order clarifying that SRECs generated after October 2017 would be stripped of their PA SREC eligibility and be reclassified as PA Tier I RECs. All SRECs generated October 2017 and prior would retain their PA SREC eligibility regardless of in or out of state location. The order also clarifies that EDCs and EGSs will have 60 days to file petitions to qualify out of state generators as PA SREC eligible under pre-existing contracts.
- May 17, 2018, pursuant to comments of reconsideration filed by Community Energy, the PA PUC decides to stay the 60 day period for EDCs and EGSs to file petitions seeking to qualify existing contracts with out of state PA eligible solar generators to maintain eligibility through the life of the contract.

PA-SITED SOLAR BUILD RATES

Monthly build over the last 6 months, for PA sited systems, has decreased by 26.4% to 2.6 MW/month as compared to the longer term last 12 month (LTM) average. Total quarterly MW build for the period ending March 2018 is significantly lower than the previous quarter reflecting a build slowdown as the PA SREC market remained oversupplied.

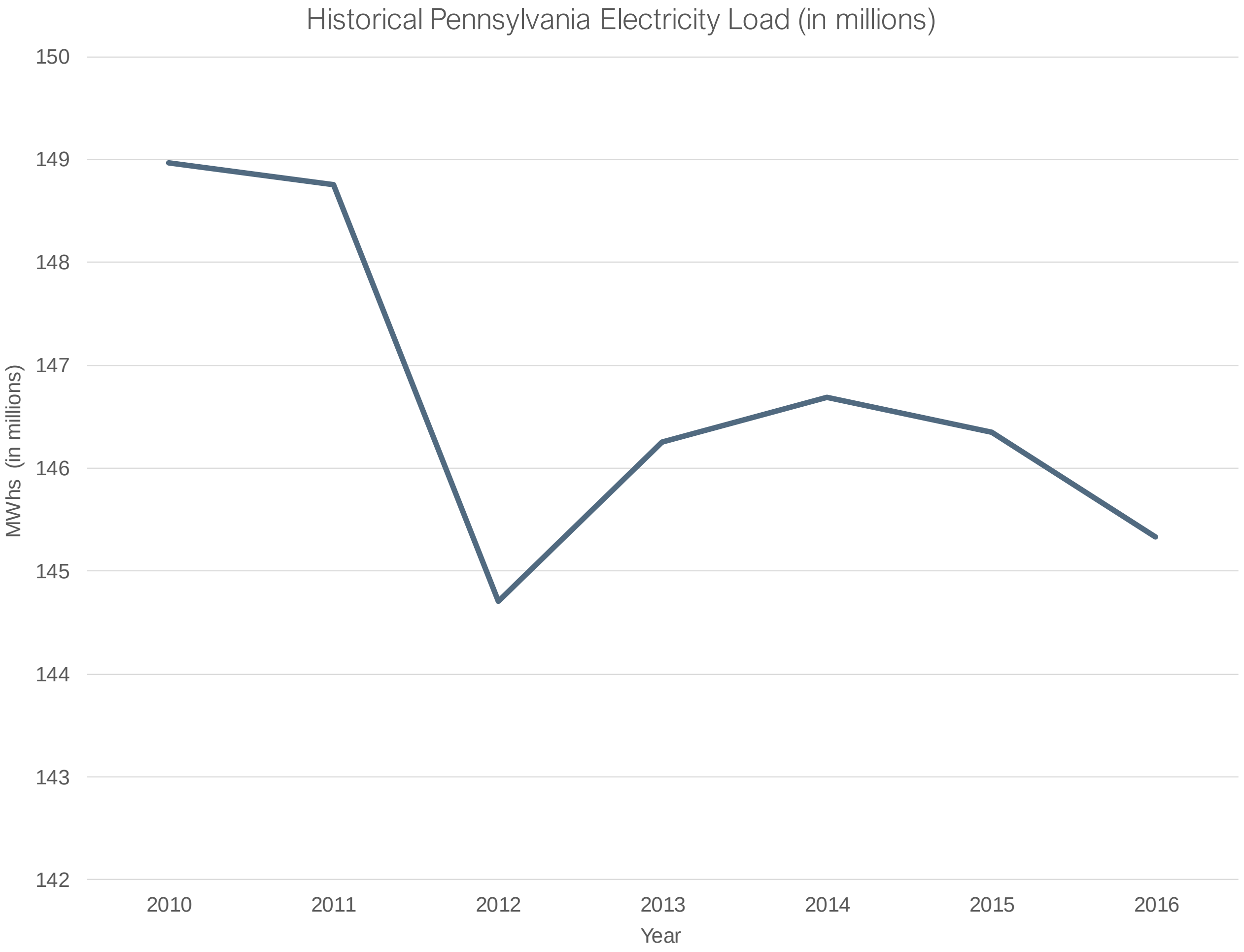


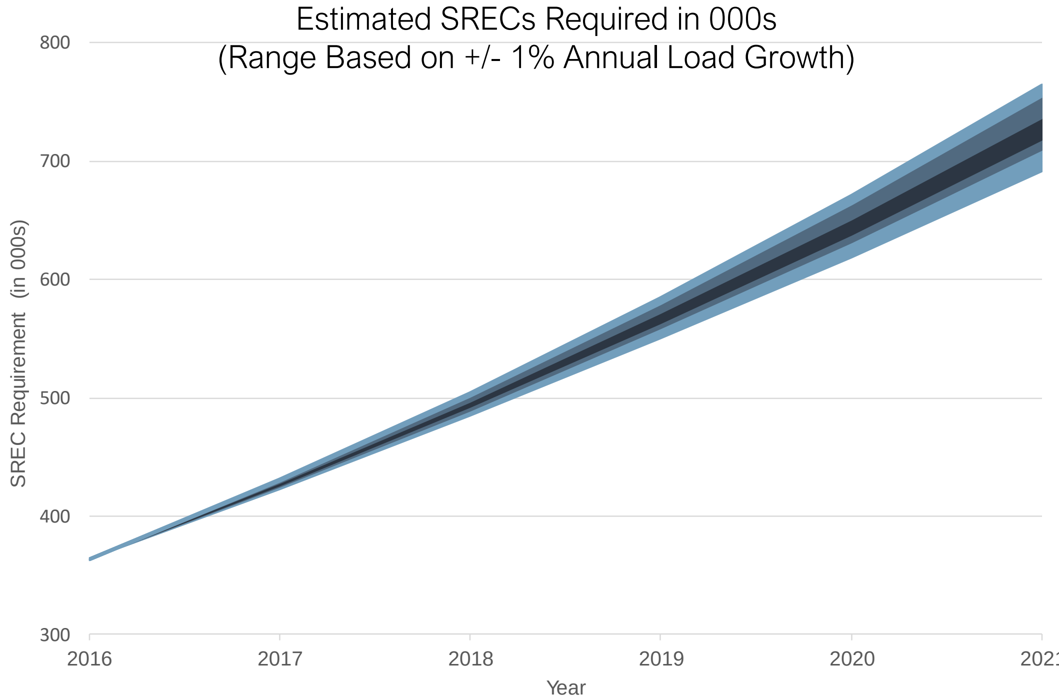


Source: PJM GATS. Last 12 month and last 6 month averages use data through March 2018. Only includes PA-sited solar facilities.

PA ELECTRICITY LOAD GROWTH SCENARIO ANALYSIS: SRECs REQUIRED

Historic electricity load served has been declining in recent years.





SRECs Required (in 000s)						
Year	RPS Solar %	-1.0% Annual Load Growth	0% Annual Load Growth	1.0% Annual Load Growth	SREC Compliance Range	SACP
2017	0.29%	422.0	426.2	430.5	8.5	$110.40
2018	0.34%	484.3	494.1	504.0	19.8	N/A
2019	0.39%	549.9	566.8	584.0	34.0	N/A
2020	0.44%	618.9	644.2	670.4	51.5	N/A
2021	0.50%	691.0	726.6	763.7	72.7	N/A

Source: SRECTrade Estimates and EIA Report "Sales to Ultimate Customers (Megawatt hours) by State by Sector by Provider, 1990-2016"

SUPPLY AND DEMAND ASSUMPTIONS

The following analysis assumes the following:

- Load growth remains flat at 2016 MWh sold – 145.33 MWh per year through 2023 (source: EIA)
- Market participants utilize older vintage in and out of state eligible SRECs as efficiently as possible. It is possible this may not occur and older vintage SRECs expire unsold.
- All SRECs are treated equally, regardless of in or out of state location, as long as eligible under Act 40 of 2017.
- Grandfathering of out-of-state facilities (i.e. through existing REC contracts with PA EGS entities) not considered, but could impact supply. Details and information on the impact of this is still forthcoming.
- Scenarios presented are derived from Last Six Month (LSM) average build rates per month. Due to the possible increase in PA sited solar build rates from the implementation of Act 40 of 2017, three scenarios are presented representing different rates of new capacity acceleration – 100%/125%/150% of current LSM build rates per month.

PA 2018 ESTIMATED SREC SUPPLY

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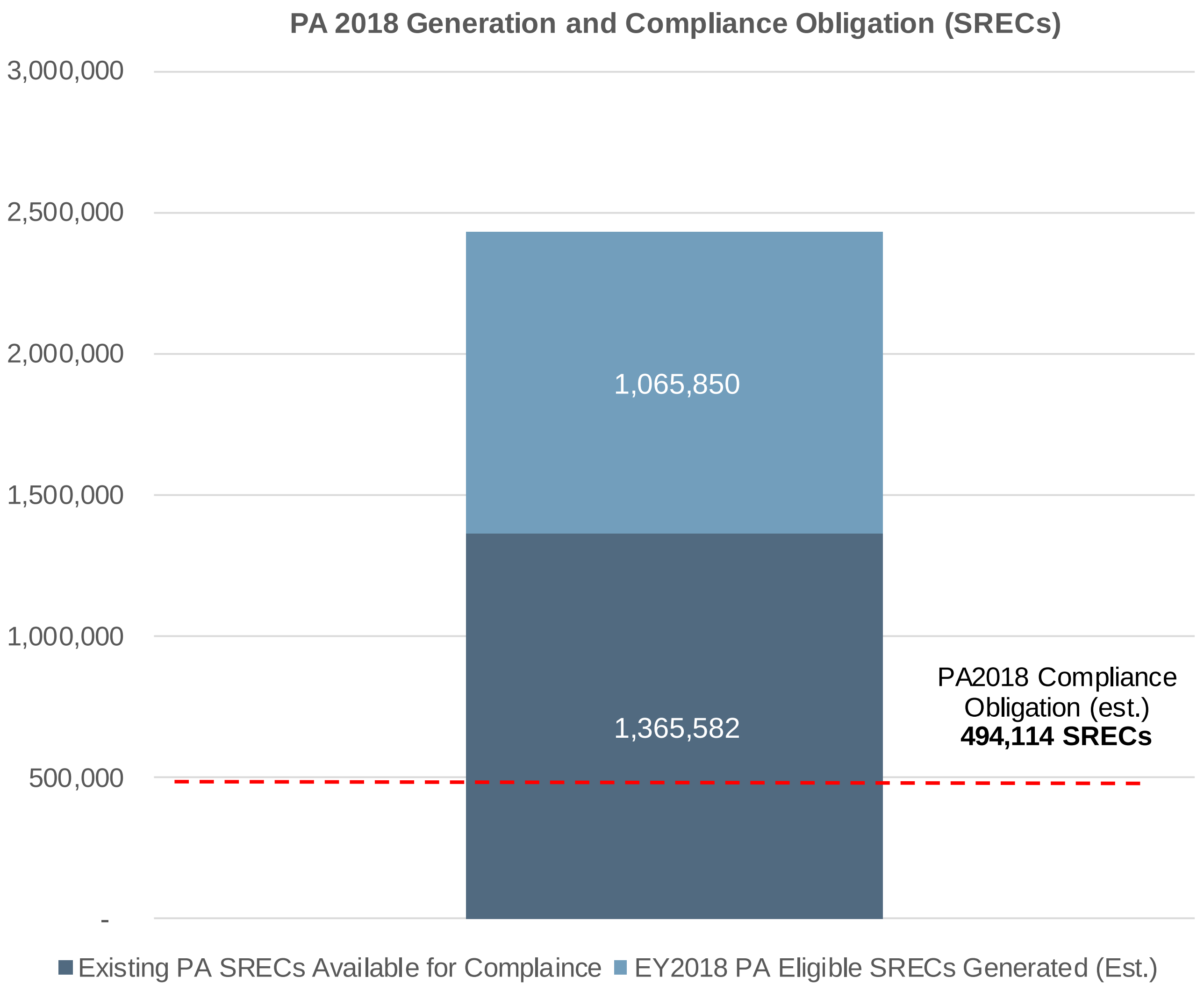
Using GATS recent issuance data as of April 2018

EY2018 Supply and Demand Summary

- Existing SRECs Available for Compliance: **1,365,582**
- 2018 Supply (projected): **1,065,850**
- Compliance Obligation (est.) : **494,114**
- Oversupply: **1,937,318** (392.1% of obligation)

Factors that could impact this include:

- Final RY2018 load figures
- Final RY2018 SRECs produced
- Grandfathered EDC and EGS contracts for out of state PA SRECs



Source: PJM GATS and SRECTrade Estimates. Figures obtained from PJM GATS were updated as of 05/22/2018.

FORECASTED SUPPLY: BUILD RATE SCENARIO ANALYSIS

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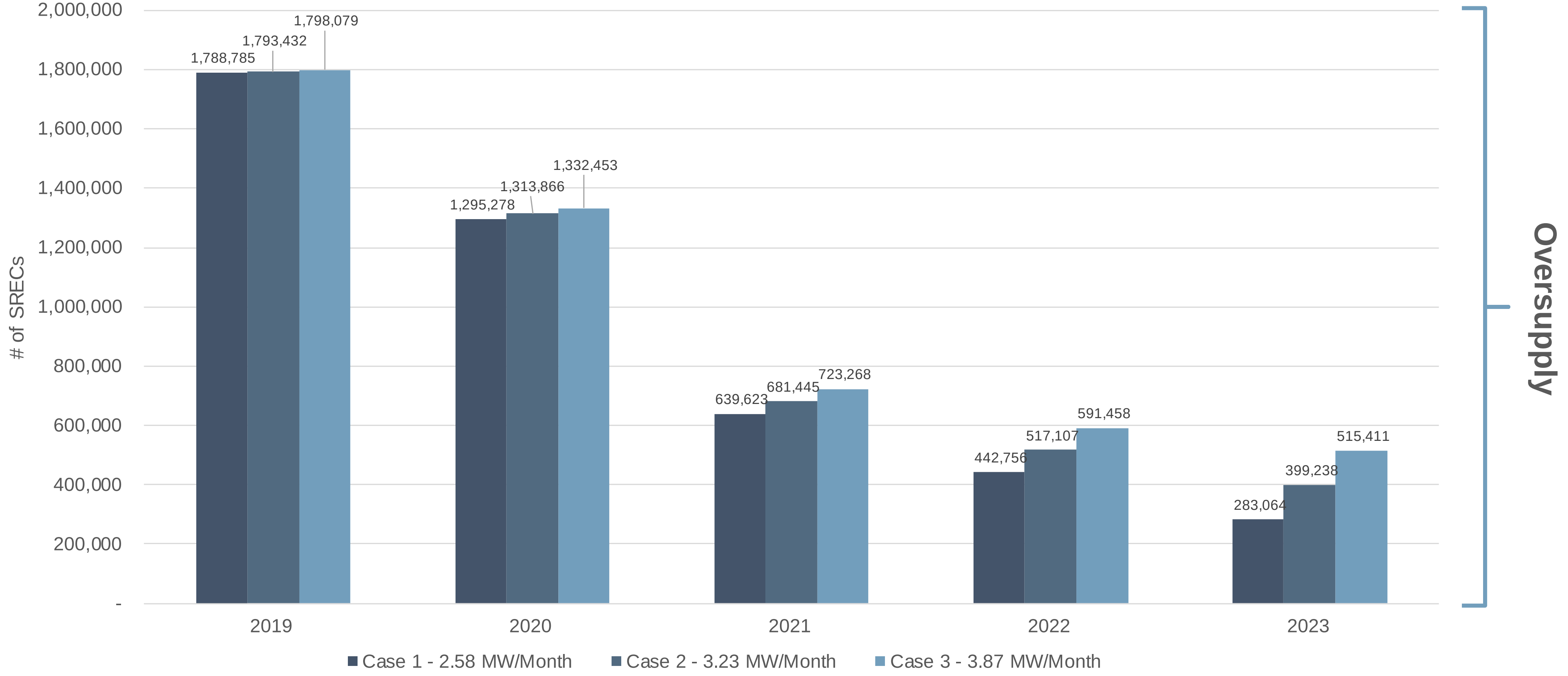
Using supply and demand assumptions from slide 6, PA SREC supply out paces demand in short to medium term.



SREC Oversupply (%)	2019	2020	2021	2022	2023
Case 1 - 2.58 MW/Month	315.6%	201.1%	88.0%	60.9%	39.0%
Case 2 - 3.23 MW/Month	316.4%	203.9%	93.8%	71.2%	54.9%
Case 3 - 3.87 MW/Month	317.2%	206.8%	99.5%	81.4%	70.9%

Source: PJM GATS and SRECTrade Estimates.

FORECASTED SUPPLY: BUILD RATE SCENARIO ANALYSIS DETAIL

Compliance year	2018	2019	2020	2021	2022	2023
Case 1 - LSM Average MW is Added Per Month Throughout the Forecast						
PA SREC Requirements	494,114	566,778	644,238	726,638	726,638	726,638
Less: Excess SRECs From Prior Period	1,365,582	1,937,318	1,484,095	873,665	639,623	442,756
Less: Case 1 Estimated SRECs Produced	1,065,850	418,245	455,420	492,596	529,771	566,947
# of SRECs Under / (Over) Supplied	**(1,937,318)**	**(1,788,785)**	**(1,295,278)**	**(639,623)**	**(442,756)**	**(283,064)**
Case 2 - 125% of LSM Average MW is Added Per Month Throughout the Forecast						
PA SREC Requirements	494,114	566,778	644,238	726,638	726,638	726,638
Less: Excess SRECs From Prior Period	1,365,582	1,937,318	1,488,742	892,253	681,445	517,107
Less: Case 2 Estimated SRECs Produced	1,065,850	422,892	469,361	515,831	562,300	608,769
# of SRECs Under / (Over) Supplied	**(1,937,318)**	**(1,793,432)**	**(1,313,866)**	**(681,445)**	**(517,107)**	**(399,238)**
Case 3 - 150% of LSM Average MW is Added Per Month Throughout the Forecast						
PA SREC Requirements	494,114	566,778	644,238	726,638	726,638	726,638
Less: Excess SRECs From Prior Period	1,365,582	1,937,318	1,493,389	910,841	723,268	591,458
Less: Case 3 Estimated SRECs Produced	1,065,850	427,539	483,302	539,065	594,828	650,592
# of SRECs Under / (Over) Supplied	**(1,937,318)**	**(1,798,079)**	**(1,332,453)**	**(723,268)**	**(591,458)**	**(515,411)**

Source: SRECTrade Estimates. Note, excess SRECs from prior period does not always equal prior period oversupply as some SRECs will expire.

SUPPLY AND DEMAND ASSUMPTIONS (IN-STATE ONLY BANK)

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- Since Act 40 was signed in October of 2017, the majority of market participants have had a strong preference to transact in-state only PA SRECs. Since the PA PUC issued its final implementation order, many participants continue to show a preference for in-state SRECs. Should this preference continue to prevail, the supply and demand dynamics looking forward shift given the eligible SREC bank has a much smaller portion of PA sited eligible SRECs.
- The analysis displayed in the following slides uses the same assumptions from slide 6, except for the assumption that the banked PA certified out of state SRECs are not used towards current or eligible future year compliance obligations.
- It would appear that this scenario is not possible, if at all likely, for a long period of time. Should a preference for in-state PA SRECs continue in the near term, it would likely lead to a price increase, at which point in time market participants would strongly consider utilizing the out of state certified bank to meet current and future compliance obligations.

IN STATE ONLY FORECASTED SUPPLY: BUILD RATE SCENARIO ANALYSIS

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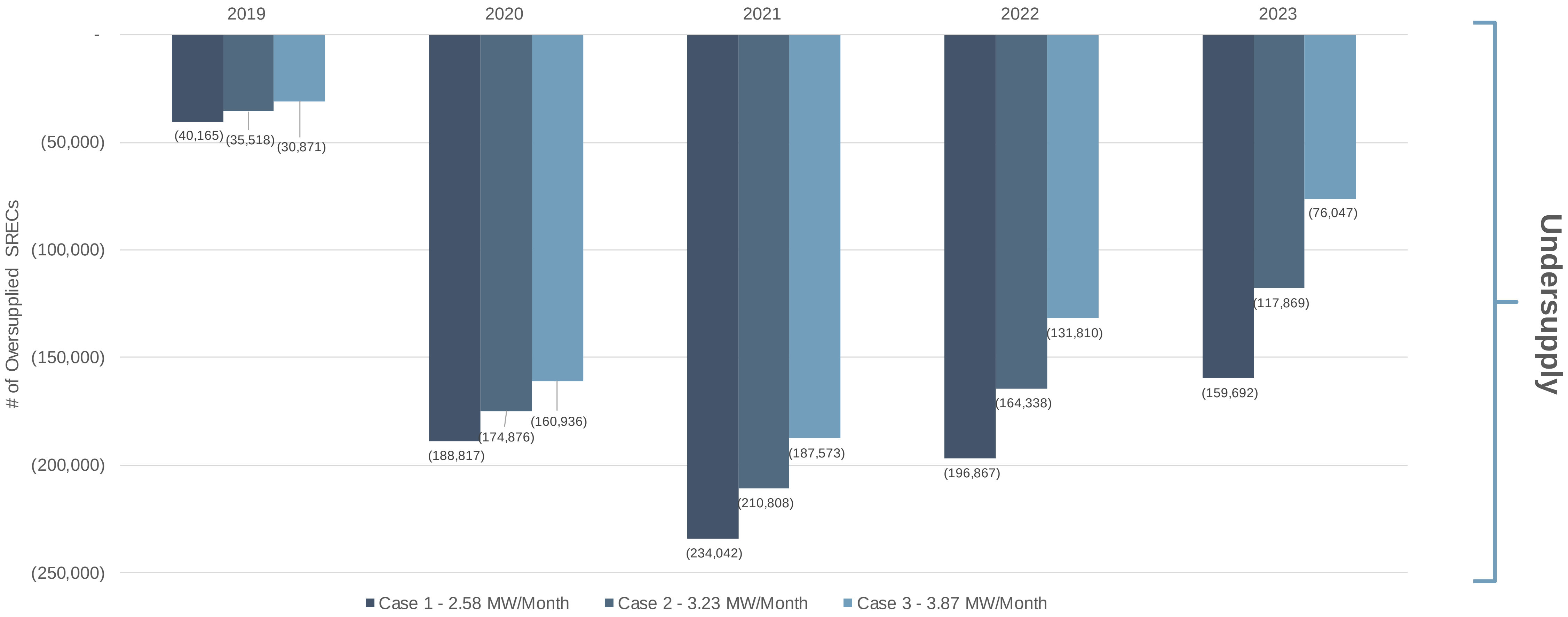

SREC Undersupply (%)	2019	2020	2021	2022	2023
Case 1 - 2.58 MW/Month	-7.09%	-29.31%	-32.21%	-27.09%	-21.98%
Case 2 - 3.23 MW/Month	-6.27%	-27.14%	-29.01%	-22.62%	-16.22%
Case 3 - 3.87 MW/Month	-5.45%	-24.98%	-25.81%	-18.14%	-10.47%

Source: PJM GATS and SRECTrade Estimates.

IN STATE ONLY FORECASTED SUPPLY: BUILD RATE SCENARIO ANALYSIS DETAIL

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Compliance year	2018	2019	2020	2021	2022	2023
Case 1 - LSM Average MW is Added Per Month Throughout the Forecast						
PA SREC Requirements	494,114	566,778	644,238	726,638	726,638	726,638
Less: Excess SRECs From Prior Period	307,030	108,368	-	-	-	-
Less: Case 1 Estimated SRECs Produced	295,452	418,245	455,420	492,596	529,771	566,947
# of SRECs Under / (Over) Supplied	**(108,368)**	**40,165**	**188,817**	**234,042**	**196,867**	**159,692**
Case 2 - 125% of LSM Average MW is Added Per Month Throughout the Forecast						
PA SREC Requirements	494,114	566,778	644,238	726,638	726,638	726,638
Less: Excess SRECs From Prior Period	307,030	108,368	-	-	-	-
Less: Case 2 Estimated SRECs Produced	295,452	422,892	469,361	515,831	562,300	608,769
# of SRECs Under / (Over) Supplied	**(108,368)**	**35,518**	**174,876**	**210,808**	**164,338**	**117,869**
Case 3 - 150% of LSM Average MW is Added Per Month Throughout the Forecast						
PA SREC Requirements	494,114	566,778	644,238	726,638	726,638	726,638
Less: Excess SRECs From Prior Period	307,030	108,368	-	-	-	-
Less: Case 3 Estimated SRECs Produced	295,452	427,539	483,302	539,065	594,828	650,592
# of SRECs Under / (Over) Supplied	**(108,368)**	**30,871**	**160,936**	**187,573**	**131,810**	**76,047**

Source: SRECTrade Estimates.

PA SREC CURRENT PRICING

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PA2017 market: $10 bid @ $12 offer
PA2018 market: $13 bid @ $15 offer

Source: SRECTrade Market Insights as of 05/25/2018