Concerns with SMUD's 2.0 Proposal & Paths Forward

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Concerns with SMUD's NEM 2.0 proposal and paths forward

- Why SMUD cares about customer-sited solar
- Impact of NEM 2.0 proposal on PV-only
- Impact of similar cuts to NEM in other utilities
- Impact of NEM 2.0 proposal on PV + ESS
- Policies to ensure the market doesn't contract
- Other solar policies

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Some reasons why SMUD cares about customer-sited solar

- 0 Carbon goal: 250-500 additional MW of PV by 2030
- 0 Carbon goal: 50-250 additional MW of storage by 2030
- To capitalize on the benefits of storage, we need to ensure there's a strong industry to install the storage when costs come down
- 40% of statewide solar is customer-sited
- Jobs in SMUD
  - 2,778 solar jobs total
    - Sacramento County = 10th county for solar jobs in the state
    - ~1,875 jobs in customer-sited installation, distribution, and operations & maintenance
  - 200+ installers total
  - 27 residential installers = 85% of the installations

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Impact of 7.4 ¢/kWh export rate on PV-only projects (Aztec)

System Size:	7,560 W-DC			
	Cash Purchase		12 Yr 2.99% with ITC Down Pymt	
	Current NEM	7.4¢ Export Rate	Current NEM	7.4¢ Export Rate
Payback Period	11.0 Years	14.4 Years	14.8 Years	19.3 Years
Total Payments	$24,138	$24,138	$33,097	$33,097
Total Incentives	$6,276	$6,276	$7,401	$7,401
Net Payments	$17,862	$17,862	$25,696	$25,696
Electric Bill Savings - Term	$49,659	$36,255	$49,659	$36,255
Upfront Payment	$24,138	$24,138	$0	$0
Annual Payments Pre-Solar	$1,752	$1,752	$1,752	$1,752
Annual Payments Post-Solar	$342	$723	$342	$723
Initial Monthly Payments	$0	$0	$178	$178

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Impact of 7.4 ¢/kWh export rate on PV-only projects (ACR Solar)

The sheet below shows Return on Investment (ROI) numbers for current NEM and Proposed 7.4 cent kWh for both cash and financed, no money down, scenarios. The system size is 5,280 kW DC.

In general, ROI's over 12 years and less than an 8% ROI are nonstarters for customers, shown in RED.

For Zero down financed, a Yearly Negative cash flow is very hard to sell (shown is a negative -$262.43)

Note I used 10.5 cents kWh to balance out self-consumption

	NEM Cash ROI	NEM Finance ROI	7.4C Cash ROI	7.4C Finance ROI
	AV 14 cents	AV 14 cents	AV 7.4 cents	AV 7.4 cents
	in years	in years	in years	in years
	Note @ 10.5 Cents to account for self consumption			
	9.88	**11.16**	**13.17**	**14.88**
	Yr savings	Yr savings	Yr savings	Yr savings
	1182.72	1182.72	887.04	887.04
	% ROI	% ROI	% ROI	% ROI
	10.12%	8.96%	7.59%	6.72%
Yearly cash position financed:		**$33.25**		**-$262.43**

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Impact of 7.4 ¢/kWh export rate on PV-only projacts (Aurora)

Case Name	Load Profile	Export Rules	Annual Consumpion (kWh)	Annual Bill ($)	System Size (kW)	Energy Yield (kWh)	Energy Offset (%)	Bill Savings ($)	Bill Offset (%)	Assumed Cost ($/W)	Simple Cash Payback Period (years)	Change payback period NEM1 to NEM2	Change monthly savings
Resi SMUD NEM 1.0	Base + AC	Retail	15,000	$ 2,320	9	15208	101%	$ 1,920	83%	$3.43	**10.82**		
Resi SMUD NEM 2.0	Base + AC	Flat 7.4	15,000	$ 2,320	9	15208	101%	$ 1,500	65%	$3.43	**14.91**	4.09	$ (35)
Resi SMUD NEM 1.0	Base + AC + EV	Retail	14,896	$ 2,204	9	15208	102%	$ 1,836	83%	$3.43	**11.29**		
Resi SMUD NEM 2.0	Base + AC + EV	Flat 7.4	14,896	$ 2,204	9	15208	102%	$ 1,404	63%	$3.43	**15.53**	4.24	$ (36)
Resi SMUD NEM 1.0	Base + AC	Retail	9,778	$ 1,597	5.4	9012	92%	$ 1,140	71%	$3.53	**11.11**		
Resi SMUD NEM 2.0	Base + AC	Flat 7.4	9,778	$1,597	5.4	9012	92%	$ 900	56%	$3.53	**14.3**	3.19	$ (20)
Resi SMUD NEM 1.0	Base + AC + EV	Retail	9,591	$ 1,485	5.4	9012	94%	$ 1,140	77%	$3.53	**11.11**		
Resi SMUD NEM 2.0	Base + AC + EV	Flat 7.4	9,591	$ 1,485	5.4	9012	94%	$ 804	54%	$3.53	**16.42**	5.31	$ (28)

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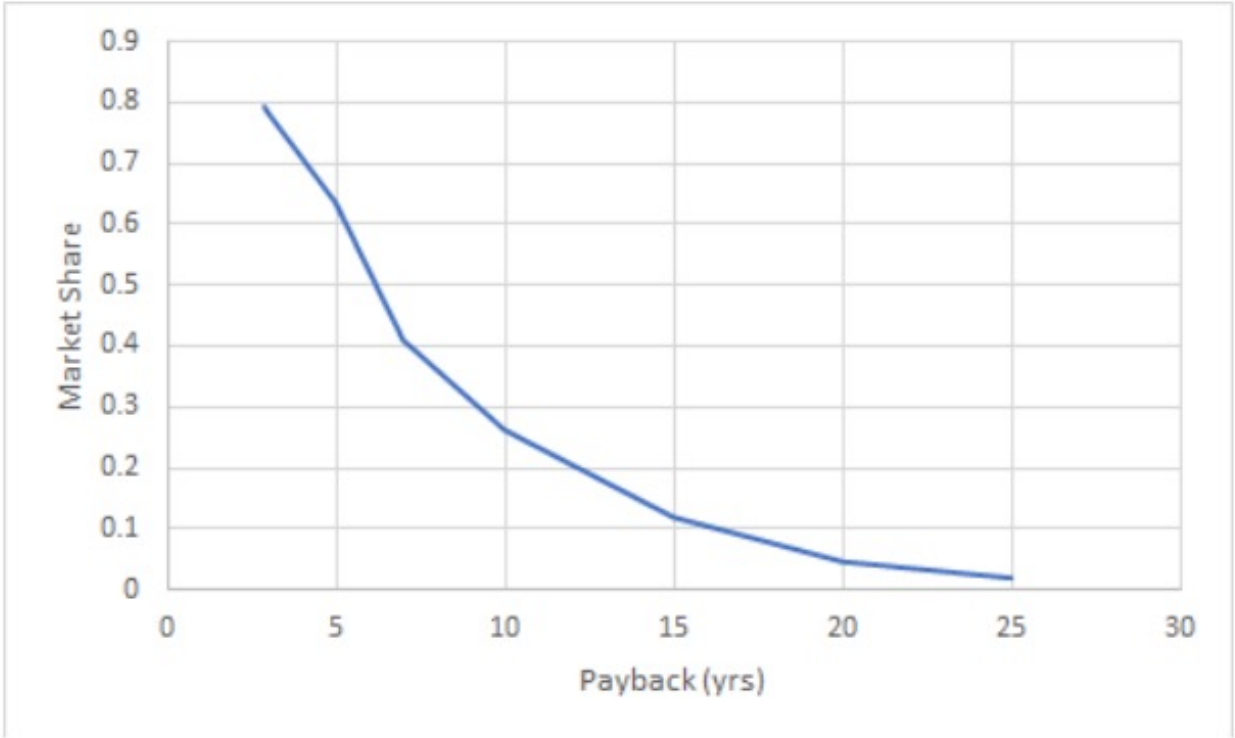
NREL survey of solar customer tolerance for payback periods



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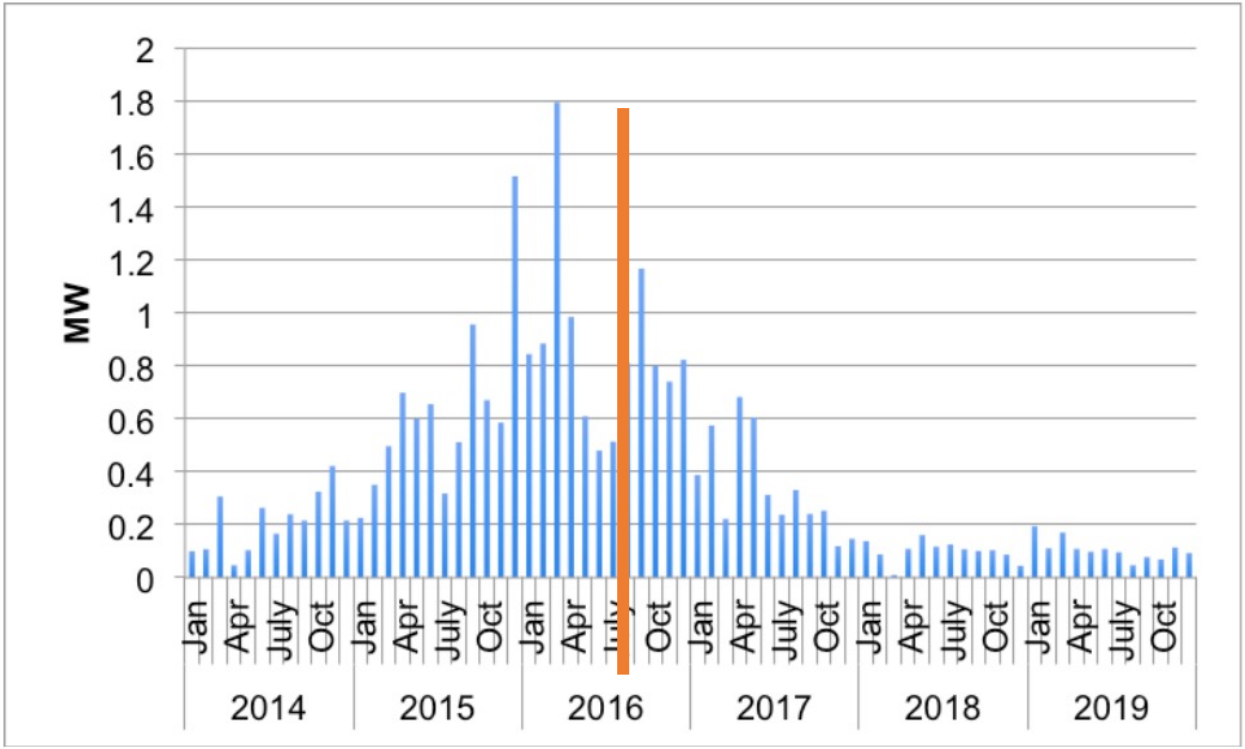
Imperial Irrigation District



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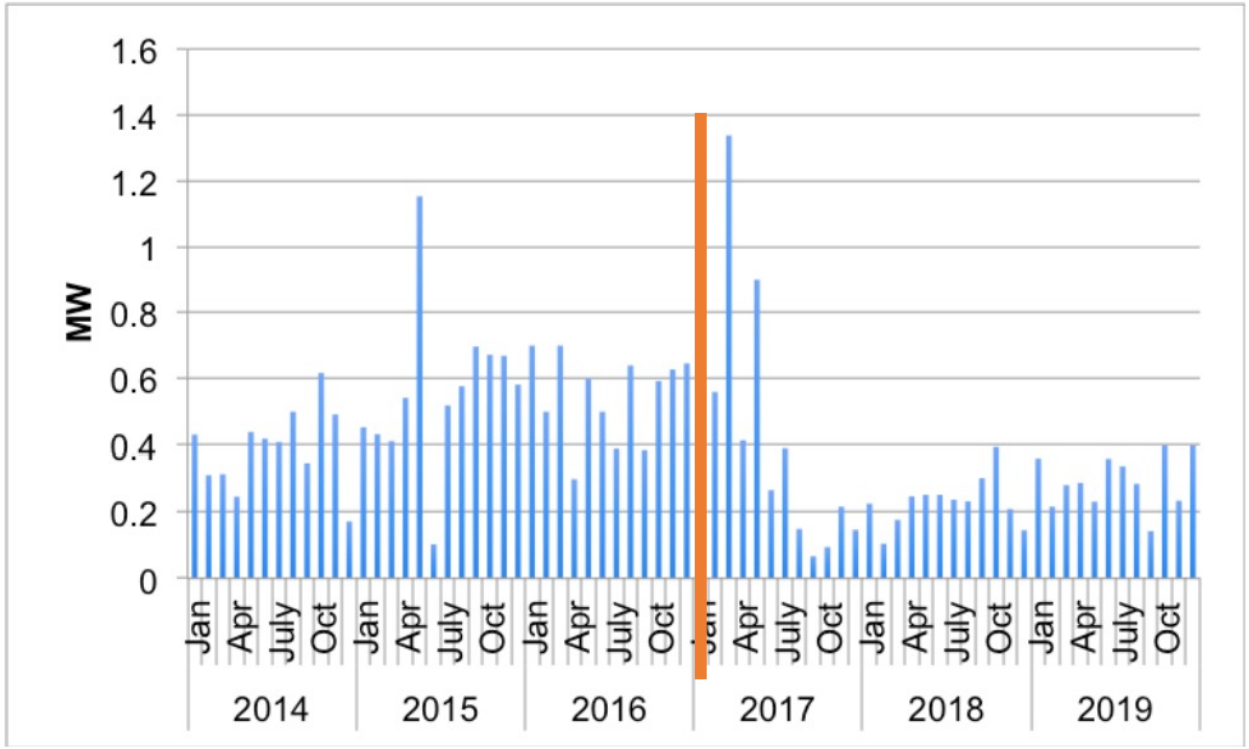
Modesto Irrigation District



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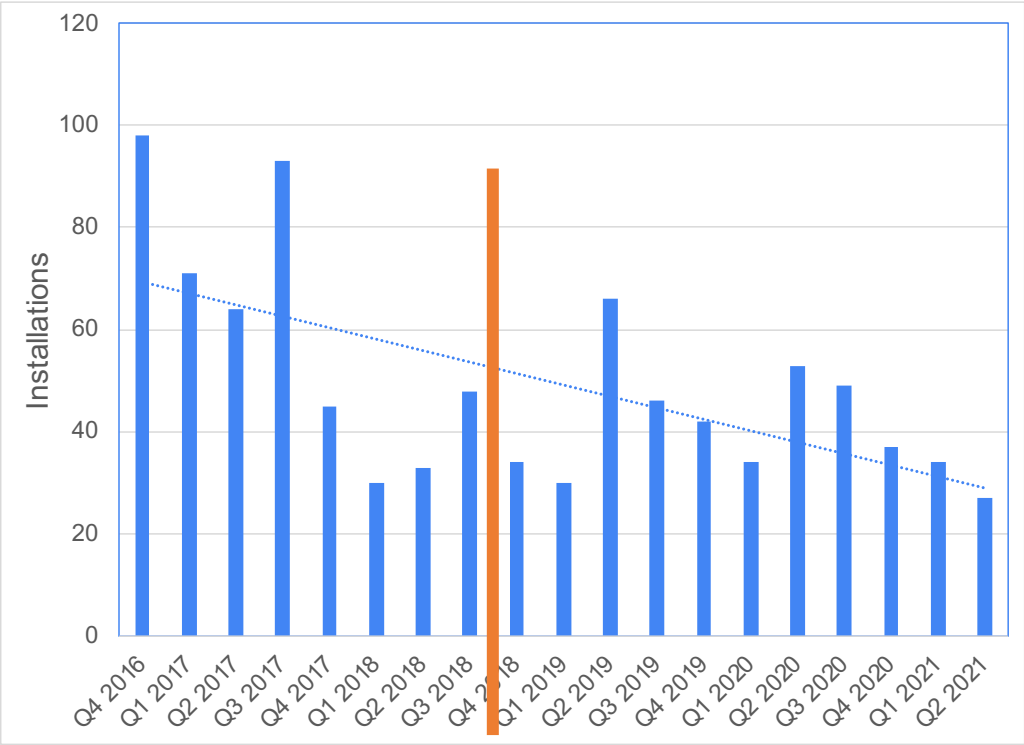
Roseville



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Impact of 7.4 ¢/kWh export rate on PV-only projects (SMUD)

	Year	Retrofit Residential (Incremental MWs)	Annual # of Homes (Retrofit)	Residential New Construction (Incremental MWs)	Annual # of Homes (New Construction)
	2020	18	3589	9	2842
	2021	30	5920	8	2823
	2022	18	3612	9	2905
	2023	16	3152	9	3117
	2024	14	2851	9	3115
	2025	14	2768	9	3117
	2026	14	2778	9	3117
	2027	14	2719	9	3115
	2028	13	2507	9	3117
	2029	11	2259	9	3117
	2030	10	2008	9	3115
Average		**16**	**3106**	**9**	**3046**

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Impact of NEM 2.0 proposal on PV + ESS (Aztec)

Project Summary	
Payment Options	Cash Purchase
IRR - Term	3.90%
Net Present Value	($3,012)
Payback Period	**16.0 Years**
Total Payments	$36,638
Total Incentives	$13,826
Net Payments	$22,812
Electric Bill Savings - Term	$38,750
Upfront Payment	$36,638
Combined Solar PV rating	Combined ESS Ratings
Power Rating: 7,560 W-DC	Energy Capacity: 13.2 kWh

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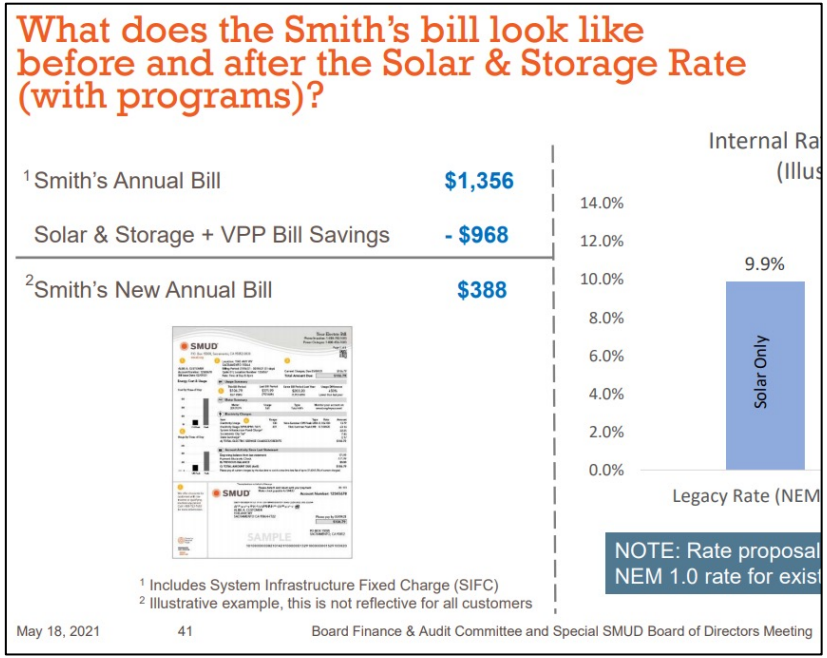
Impact of NEM 2.0 proposal on PV + ESS (Sunrun)

- **Concern #1: Long payback period**
- **Concern #2: No net savings if the system is financed**
- $968 annual savings
  - Eric Poff's presentation on May 18, 2021
  - Peak shaving and VPP participation
- 4kW @$4.0/W scenario
  - $16,000 cost of solar
  - $10,000 cost of battery
  - -$6,760 ITC @ 26%
  - -$2,500 upfront incentive
- Total S+S system cost: $16,740

3% loan	10 years	15 years	20 years
Monthly payment	$161	$115	$92
Annual payments	$1,932	$1,380	$1,104



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Impact of NEM 2.0 proposal on PV + ESS (Sunrun)

Annual savings: $968

- 6 kW @ $3.5/W scenario
  - $21,000 cost of solar
  - $10,000 cost of battery
  - -$8,060 ITC @26%
  - -$2,500 upfront VPP incentive
- Total S+S system cost: $22,440

3% loan	10 years	15 years	20 years
Monthly payment	$197	$141	$113
Annual payments	$2,362	$1,692	$1,356

- 4 kW @ $3.0/W scenario
  - $12,000 cost of solar
  - $10,000 cost of battery
  - -$5,720 ITC @26%
  - -$2,500 upfront VPP incentive
- Total S+S system cost: $13,780

3% loan	10 years	15 years	20 years
Monthly payment	$133	$95	$76
Annual payments	$1,596	$1,140	$940

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Policies to ensure a strong customer-sited solar market

- Glide path for export rate
- Lengthen the adjustment period
  - Currently, the Board would vote in September, and new NEM rate would apply to customers interconnected in January
- Increase proposed export rate
- Tie exports to TOU periods
- Strengthen the proposed ESS programs
- Leverage solar installations to help SMUD meet other goals
  - Incentives for PV + electrification
  - Subsidies for low-income customers
  - Demand-response voltage support

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Concerns with other proposed solar policies

- Eligibility period for NEM 1.0 customers ending in 2030
- Inability to right size systems for future electrification
- High interconnection fees
- Market-rate housing and multi-tenant commercial precluded from VNEM

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Math for VNEM (Shared Savings)

20 Year Savings Analysis

Year	Tax Savings (Federal & State)	Common Area Energy Savings	PPA Income from Tenants ($0.10/kwh)	Total Annual Revenue:	Cumulative Owner Net Income	Total Tenant Savings	Savings per year per apartment
1	$ 887,116	$ 16,167	$ 75,081	$ 978,364	-$ 452,236	$ 44,209	$ 99.57
2	$ 51,730	$ 16,652	$ 76,471	$ 144,853	-$ 307,383	$ 45,528	$ 102.54
3	$ 31,038	$ 17,152	$ 78,001	$ 126,190	-$ 181,193	$ 46,894	$ 105.62
4	$ 18,623	$ 17,666	$ 79,561	$ 115,850	-$ 65,343	$ 48,300	$ 108.78
5	$ 18,623	$ 18,196	$ 81,152	$ 117,971	$ 52,628	$ 49,749	$ 112.05
6	$ 9,311	$ 18,742	$ 82,775	$ 110,828	$ 163,455	$ 51,242	$ 115.41
7		$ 19,304	$ 84,430	$ 103,735	$ 267,190	$ 52,779	$ 118.87
8		$ 19,883	$ 86,119	$ 106,002	$ 373,192	$ 54,362	$ 122.44
9		$ 20,480	$ 87,841	$ 108,321	$ 481,513	$ 55,993	$ 126.11
10		$ 21,094	$ 89,598	$ 110,692	$ 592,206	$ 57,673	$ 129.89
11		$ 21,727	$ 91,390	$ 113,117	$ 705,323	$ 59,403	$ 133.79
12		$ 22,379	$ 93,218	$ 115,597	$ 820,920	$ 61,185	$ 137.81
13		$ 23,050	$ 95,082	$ 118,132	$ 939,052	$ 63,021	$ 141.94
14		$ 23,742	$ 96,984	$ 120,726	$ 1,059,778	$ 64,912	$ 146.20
15		$ 24,454	$ 98,924	$ 123,378	$ 1,183,155	$ 66,859	$ 150.58
16		$ 25,188	$ 100,902	$ 126,090	$ 1,309,245	$ 68,865	$ 155.10
17		$ 25,943	$ 102,920	$ 128,863	$ 1,438,108	$ 70,931	$ 159.75
18		$ 26,722	$ 104,978	$ 131,700	$ 1,569,808	$ 73,059	$ 164.55
19		$ 27,523	$ 107,078	$ 134,601	$ 1,704,409	$ 75,250	$ 169.48
20		$ 28,349	$ 109,220	$ 137,568	$ 1,841,978	$ 77,508	$ 174.57
TOTALS:	**$ 129,325**	**$ 434,413**	**$ 1,821,724**	**$ 3,272,578**	**$ 1,841,978**	**$ 1,187,722**	

How a glide path protects the market – PV only projects

Figures in table are illustrative

Year	NEM rate (cents/kWh)	Total cost	PV size (W)	PV ($/W)	Fed tax credit	Payback period	Notes/assumptions
2021	13.4	$14,208	6,000	$3.20	26%	12.0	
2021	7.4	$14,208	6,000	$3.20	26%	15.3	
2022	7.4	$13,853	6,000	$3.12	26%	15.0	Assumptions: cost reductions largely from lower soft costs (e.g., gradual adoption of SolarAPP)
2022	11.5	$13,853	6,000	$3.12	26%	12.1	Assumptions: cost reductions largely from lower soft costs (e.g., gradual adoption of SolarAPP)
2023	10.5	$14,227	6,000	$3.04	22%	13.0	Assumptions: cost reductions largely from lower soft costs (e.g., gradual adoption of SolarAPP)
2024	9	$13,853	6,000	$2.96	22%	13.7	Assumptions: cost reductions largely from lower soft costs (e.g., gradual adoption of SolarAPP); ITC extended
2025	7.4	$13,478	6,000	$2.88	22%	14.5	Assumptions: All building departments have adopted SolarAPP, leading to 10% reduction in costs from 2021; ITC remains extended

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How a glide path protects the market – PV + Storage projects

Figures in table are illustrative

PV (6 kW) + Storage (10 kWh)										
Year	NEM rate (cents/kWh)	Total cost	PV size (W)	PV ($/W)	Storage size (W)	Storage ($/Wh)	Storage subsidies	Annual VPP payment	Fed tax credit	Payback period
2021	13.4	$19,610	6,000	$3.20	10,000	1.050	$2,000	$120	26%	15.0
2022	7.4	$17,664	6,000	$3.12	10,000	0.945	$2,500	$180	26%	15.0
[redacted]										
2022	11.5	$17,664	6,000	$3.12	10,000	0.945	$2,500	$180	26%	13.2
2023	10.5	$17,661	6,000	$3.04	10,000	0.845	$2,250	$180	22%	13.7
2024	9	$16,743	6,000	$2.96	10,000	0.750	$2,000	$180	22%	13.6
2025	7.4	$15,861	6,000	$2.88	10,000	0.660	$1,750	$180	22%	13.6
2026	7.4	$15,585	6,000	$2.88	10,000	0.600	$1,500	$180	22%	13.4

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