

Residential Solar Analysis



a Massachusetts home

Prepared September 24, 2026 · SIA Solar Design Studio

OUR RECOMMENDATION

39 panels (15.6 kW) on the seven roof faces that earn RMLD's rebate. No battery. Paid in cash.

\$32,452

net cost after RMLD rebate
and MA credit

11.3 yrs

to pay for itself

\$52,329

saved over 25 years

Good

the Studio's rating

UPGRADE OPTION

Add a 13.5 kWh battery

\$46,052 17.5 yrs \$30,569

net cost payback saved over 25 yrs

Costs \$21,760 of your savings. Worth it only if outage backup matters to you — RMLD credits exports at a quarter of retail, so a battery comes closer here than most places, but still does not pay for itself.

AVOID

Dealer-financed loans

\$485/mo 22.4 yrs \$11,138

payment payback saved over 25 yrs

A 15% dealer fee (\$7,826) is buried in the price, not shown as a line item. It costs you \$41,191 over 25 years. Leases and PPAs are not available in RMLD territory at all.

What we found

SHADE

7 of 13 faces

clear RMLD's 70% shading test. North faces reach 23–32% and never will — orientation, not trees.

UTILITY

RMLD, not Eversource

Municipal. Its own rate, export credit and incentives. No lease or PPA available here.

FEDERAL CREDIT

\$0

The 30% credit ended for systems placed in service after 31 Dec 2025. Any quote showing it is wrong.

RMLD REBATE

\$18,720

\$1,200/kW, capped at half the cost and \$24,000. With the federal credit gone, this is what makes solar work here.

YOUR RATE

\$0.2011/kWh

All-in, from RMLD's filed tariff plus monthly adjustments. Usage near 29,943 kWh/yr is why it pays.

NET METERING

\$0.0520/kWh

Not retail. RMLD credits exports at its fuel charge only — 26% of the \$0.2011 you pay. MA net-metering rules do not bind municipals.

SIZE

50% of your bill

Payback barely moves from 8 to 39 panels, so take every qualifying one. Savings quadruple across it.

MAIN PANEL

+\$3,500

13.0 kW AC back-feed exceeds NEC 705.12's 7.7 kW limit on a 200 A bus, so the panel needs upgrading. Included in every figure here.

PRICE

\$3.12/W

Modelled MA market price, not a quote. Solar pays from \$2.60 to \$4.00/W, but the spread is worth \$21,840.

SMART PROGRAMME

Not eligible

Eversource, National Grid and Unitil customers only. A proposal counting SMART revenue does not apply to you.

Next steps

- | | | | |
|--|---|--|---|
| 1 Check the rate
Divide a recent RMLD bill by the kWh used. It should land near \$0.20. Everything here moves with it. | 2 Call RMLD
781-942-6598. Ask whether the rebate programme year still has funds before you sign anything. | 3 Get quotes by face
A quote should name which roof faces it uses. Panels on the north faces earn no rebate and a third of the output. | 4 Ask the cash price
Separately from the financed price. The gap is the dealer fee. Ask if they have done RMLD interconnections before. |
|--|---|--|---|

Roof and shading from Google Solar API imagery (9/2022, high quality); production from NLR PVWatts v8. Rate from RMLD tariff MDPU #317 plus monthly adjustments, Apr–Sep 2026. Federal credit 0% (section 25D terminated after 31 Dec 2025). Escalation 2.5%/yr, degradation 0.5%/yr, upkeep \$34/kW-yr, discount 5%, 25 years, \$3.12/W modelled for MA (DOE PVSCB). Estimates from the SIA Solar Design Studio, not a quote. SIA is paid by no installer and sells no equipment.

SAMPLE

Your roof



a Massachusetts home

Prepared September 24, 2026 · SIA Solar Design Studio

Roof image blurred for privacy · sample

SAMPLE

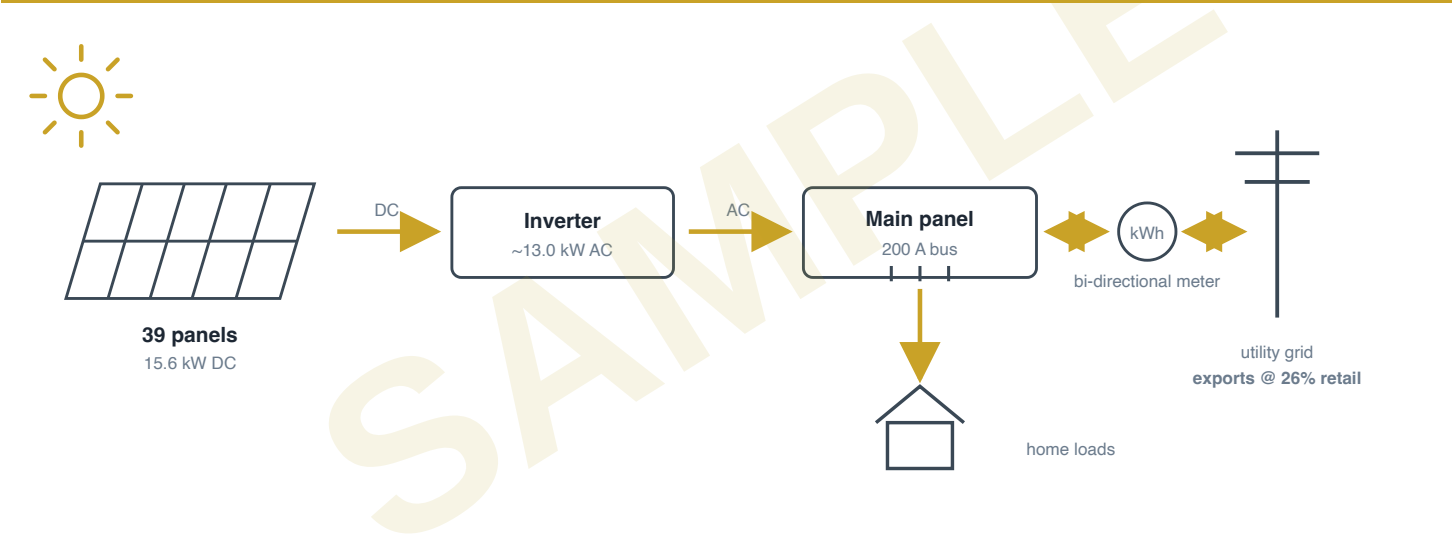
The recommended 39-panel layout on Google's solar flux map of your roof. Yellow is the most sunlight, purple the least — the dark bands across the lower roof are tree shade. Panels are placed only where the roof clears RMLD's 70% shading test.

Illustrative sample of an SIA custom analysis · the client's address and roof imagery have been removed.

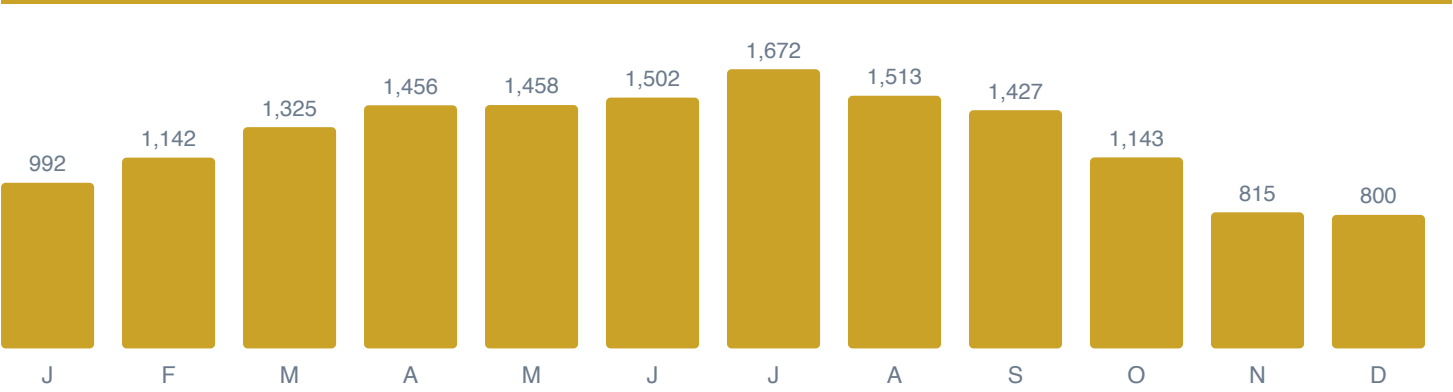
Proposed system

Panels	39 × 400 W
System size	15.6 kW DC
Estimated year-1 production	15,245 kWh AC (NLR PVWatts v8)
First-year bill offset	50.1%
Roof faces used	S7, S10, S11, S4, S16, S1, S5
Faces excluded by the rebate test	6 of 13

System schematic



Production by month



Expected AC output, kWh, after measured shading. December runs about a third of July — a Massachusetts winter is why a system here does not cover a large bill outright without over-exporting the summer at a quarter price.

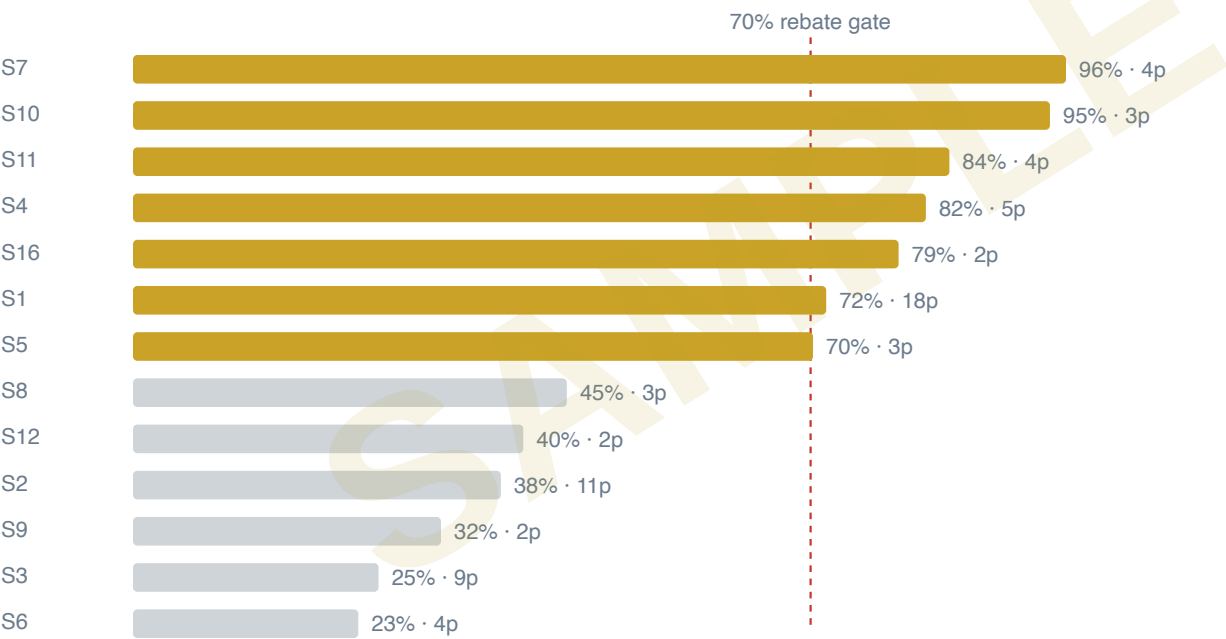
Shading & the rebate test



a Massachusetts home
Prepared September 24, 2026 · SIA Solar Design Studio

RMLD pays its rebate only on an array with a **Total Solar Resource Fraction of 70% or better**. This single rule decides the system size on this house, and it is the part a generic quote is most likely to miss. TSRF multiplies two things:

- **Solar access** — how much available sunlight actually reaches that face after trees and nearby structures, measured from Google's 3D scan.
- **Orientation factor** — what a face at that tilt and compass direction can collect against the best possible orientation here, about 1,327 kWh per kW per year.



TSRF by roof face, using the Studio's own S-numbers so you can open the Shade Studio for this address and compare line by line. Gold clears RMLD's 70% threshold; grey does not. Faces marked * have a hand-corrected azimuth — Google's roof model was a few degrees out on three faces, and the Studio re-simulated at 15,245 kWh/yr, 0.6% below its first estimate.

Faces that qualify

FACE	AZIMUTH	TILT	PANELS	SOLAR ACCESS	ORIENTATION	TSRF	REBATE
S7	195° *	35°	4	98%	99%	96%	Qualifies
S10	188°	42°	3	95%	100%	95%	Qualifies
S11	190° *	42°	4	85%	99%	84%	Qualifies
S4	193°	37°	5	83%	99%	82%	Qualifies

S16	179°	37°	2	79%	100%	79%	Qualifies
S1	100°	38°	18	88%	81%	72%	Qualifies
S5	100° *	21°	3	84%	84%	70%	Qualifies

Faces that do not

FACE	AZIMUTH	TILT	PANELS	SOLAR ACCESS	ORIENTATION	TSRF	REBATE
S8	83°	16°	3	56%	80%	45%	No rebate
S12	279°	38°	2	57%	71%	40%	No rebate
S2	281°	37°	11	54%	70%	38%	No rebate
S9	16°	34°	2	63%	50%	32%	No rebate
S3	10°	39°	9	56%	45%	25%	No rebate
S6	10°	40°	4	53%	44%	23%	No rebate

The pattern is clean. Your south-facing roof (azimuth near 180°) is excellent, with S7 reaching 96% — about as good as a roof gets. The north faces near 10° reach only 23–32%, held down by orientation alone. The west faces at 280° sit at 38–40% on a mix of orientation and shade.

S5 sits exactly on the line. At 70.0% it clears RMLD's threshold by nothing at all, and it is one of the three faces whose azimuth we corrected by hand. If RMLD's own assessment puts it a point lower, those 3 panels (1.2 kW) lose the rebate — about \$1,440. Ask your installer to confirm S5's TSRF with RMLD before it goes in the design. The other six faces have real margin.

We are not going to suggest cutting your trees. Some of this shade comes from mature trees on and around the property. They have their own value — shade, privacy, cooling, the look of the place — and designing the array around them is the right answer. The 15.6 kW above assumes every tree stays exactly where it is.

The money



a Massachusetts home
Prepared September 24, 2026 · SIA Solar Design Studio

What you pay today

You told us about **\$510 a month**. On RMLD's Schedule A that implies roughly **29,943 kWh a year** — around double a typical Massachusetts household, and the reason solar works here.

COMPONENT	RATE	SOURCE
Distribution energy charge	\$0.09637/kWh	Tariff MDPU #317
Fuel, capacity, efficiency, NYPA credit	\$0.10475/kWh	Monthly adjustments, Apr–Sep 2026
All-in rate	\$0.2011/kWh	Sum of the above
Customer charge	\$8.21/month	Tariff MDPU #317
Credit for exported power	\$0.0520/kWh	Monthly fuel charge only

Worth knowing: RMLD re-files fuel and capacity monthly and they move a lot — your all-in rate ran \$0.183 to \$0.215 between April and September 2026. We used the six-month average, because a payback runs decades and a single month would be the wrong basis.

What RMLD pays you for exports

RMLD does not offer net metering at the retail rate. This is the single most misunderstood thing about going solar in Wilmington, and it changes what a system is worth.

DIRECTION	RATE	BASIS
Power you buy from RMLD	\$0.2011/kWh	Full all-in retail rate
Power you export to RMLD	\$0.0520/kWh	Monthly fuel charge only — no distribution, no capacity, no efficiency charge
Export credit as a share of retail	26%	\$0.0520 ÷ \$0.2011

In RMLD's own words, the credit is *"the monthly energy received kilowatt hour (KWH) amount multiplied by the fuel charge for that billed month."* The fuel charge moves every month; it averaged \$0.0520/kWh between April and September 2026. RMLD also states that **energy generated and used within the same hour does not count as an export at all** — it simply never gets bought, which is the best outcome for you.

Check this on any proposal you receive. Massachusetts' net-metering rules, which credit exports at close to the full retail rate, bind Eversource, National Grid and Unitil — **not** municipal utilities like RMLD. Software that assumes a Massachusetts address means retail-rate net metering will value your exports at \$0.2011/kWh instead of \$0.0520, overstating what the system saves. On an array this size that is the difference between a 11.3-year payback and a far rosier one that will not happen.

Ask any installer directly: *"what export rate did you use, and is it RMLD's fuel charge?"*

What this means for the design. A kWh you use as you make it is worth \$0.2011. The same kWh exported is worth \$0.0520 — about a quarter. That is why we size to 50% of your usage rather than 100%: past a point you are buying capacity that mostly exports at a quarter price. It is also why a battery comes closer to paying here than in most of the country, and still does not quite get there.

Cash purchase

\$32,452

net cost

11.3 yrs

payback

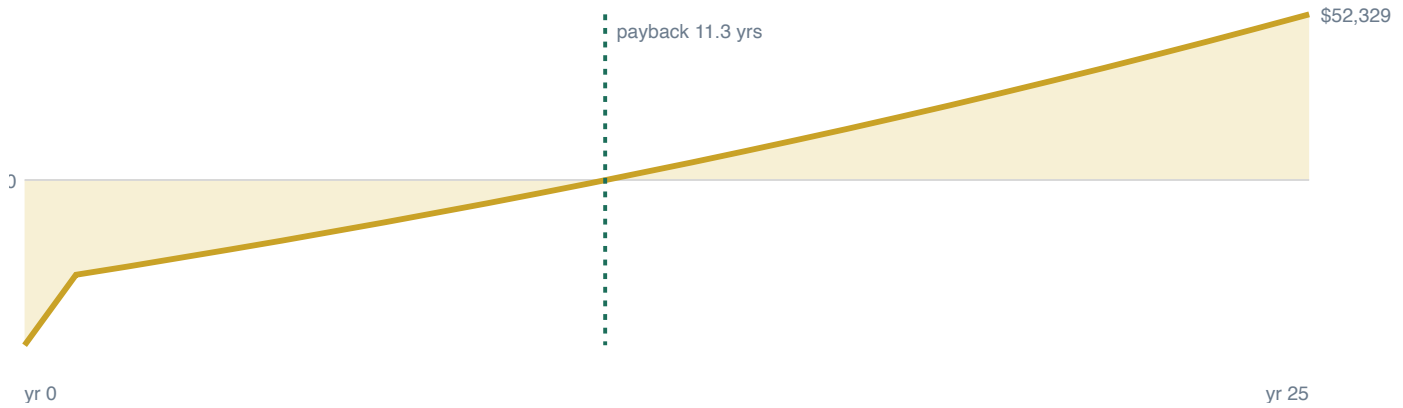
\$52,329

25-yr net savings

7.8%

annual return

System cost, 15.6 kW at \$3.12/W	\$48,672
Main panel upgrade (NEC 705.12)	\$3,500
RMLD capacity rebate, \$1,200/kW	−\$18,720
Federal tax credit	−\$0
Massachusetts income tax credit	−\$1,000
Net cost	\$32,452
Year-1 savings	\$2,535
Net savings over 25 years	\$52,329
Net present value	\$11,748
Levelised cost of this power	19.5¢/kWh



Cumulative position, cash purchase. The line crosses zero at payback.

The federal credit is gone. Section 25D, the 30% residential credit, was terminated for expenditures made after 31 December 2025. A system installed in 2026 gets nothing from it. If a proposal you receive subtracts 30% of the price as a federal credit, that is roughly \$14,602 of savings that will not arrive, and you would find out at tax time.

Your main panel has to be upgraded. A 200 A panel can accept about **7.7 kW** of back-fed solar under NEC 705.12's "120% rule" — $(200 \text{ A} \times 20\% \times 240 \text{ V}) \div 1.25$. This system's inverter is about 13.0 kW AC, well past that, so the panel must be upgraded or the main breaker derated. We have included **\$3,500**, which is a typical figure; a real quote may differ, and a derate is sometimes cheaper.

Two things worth checking: confirm your service is actually 200 A (it is on the main breaker), and ask whether a breaker derate would work instead. If you went smaller than about 9.2 kW the upgrade would not be needed at all — but as the size table shows, the larger system still wins even carrying this cost.

Incentives that apply

INCENTIVE	VALUE HERE	NOTES
RMLD residential solar rebate	\$18,720	\$1,200/kW; capped at 50% of cost and \$24,000; TSRF ≥ 70%
MA Residential Renewable Energy Income Tax Credit	\$1,000	15% of net cost, capped at \$1,000
MA sales tax exemption	included	No sales tax on the equipment
MA property tax exemption	—	Added home value exempt for 20 years

Incentives that do not

- **Federal tax credit (section 25D).** Terminated for systems placed in service after 31 December 2025.

- **SMART.** Worth thousands, but open only to Eversource, National Grid and Unitil customers. RMLD is municipal, so you are not eligible.
- **Mass Save.** Funded by the investor-owned utilities' ratepayers. RMLD runs its own programmes instead — the rebate above is one of them.
- **Retail-rate net metering.** Massachusetts' rules bind the investor-owned utilities. RMLD sets its own export terms, which is why your credit is the fuel charge.
- **Leases and PPAs.** Third-party ownership is not available in RMLD territory. If someone offers you one for this address, check everything else they have told you.

How big a system?

PANELS	SIZE	NET COST	PAYBACK	BILL OFFSET	25-YR SAVINGS
8	3.2 kW	\$8,722	14.3 yr	10%	\$8,669
11	4.4 kW	\$10,948	13.2 yr	14%	\$12,965
14	5.6 kW	\$13,252	12.7 yr	18%	\$17,182
17	6.8 kW	\$15,556	12.3 yr	22%	\$21,400
20	8.0 kW	\$17,860	12.0 yr	26%	\$25,617
23	9.2 kW	\$20,164	11.8 yr	30%	\$29,835
26	10.4 kW	\$22,468	11.7 yr	33%	\$34,053
29	11.6 kW	\$24,772	11.6 yr	37%	\$38,270
32	12.8 kW	\$27,076	11.5 yr	41%	\$42,488
35	14.0 kW	\$29,380	11.4 yr	45%	\$46,705
38	15.2 kW	\$31,684	11.3 yr	49%	\$50,923
39	15.6 kW	\$32,452	11.3 yr	50%	\$52,329

Payback moves only from 14.3 to 11.3 years across that whole range while total savings more than quadruple. Take every qualifying panel. If budget is the constraint, a half-size system pays back in about the same time — you are not penalised for starting smaller, you just bank less.

If the price is different

INSTALLED PRICE	SYSTEM COST	NET COST	PAYBACK	25-YR SAVINGS
\$2.60/W	\$44,060	\$24,340	8.7 yr	\$60,441
\$2.80/W	\$47,180	\$27,460	9.7 yr	\$57,321

\$3.00/W	\$50,300	\$30,580	10.7 yr	\$54,201
\$3.12/W	\$52,172	\$32,452	11.3 yr	\$52,329
\$3.40/W	\$56,540	\$36,820	12.6 yr	\$47,961
\$3.60/W	\$59,660	\$39,940	13.5 yr	\$44,841
\$3.80/W	\$62,780	\$43,060	14.4 yr	\$41,721
\$4.00/W	\$65,900	\$46,180	15.3 yr	\$38,601

Solar pays at every price in that range, because your bill is large. Use this when you compare quotes: at \$4.00/W you still come out ahead, but it costs about \$13,728 against \$3.12/W — worth a third quote before you accept it.

Battery

	NET COST	PAYBACK	25-YR SAVINGS
Solar only	\$32,452	11.3 yr	\$52,329
Solar + 13.5 kWh battery	\$46,052	17.5 yr	\$30,569

A battery costs about \$13,600 installed and leaves you \$21,760 worse off over 25 years. It comes closer here than in most places, because every kWh it keeps at home instead of exporting is worth \$0.149 more. It still does not clear its own cost, and it needs replacing around year 16. Outage backup is a fair reason to buy one anyway — just not an expectation that it pays for itself.

If you do add one, read RMLD's rules first. Their buyback programme requires that a battery not charge from the grid and not export; customers who breach that forfeit export credits entirely. A configuration detail, but it has to be right on day one.

Paying for it

OPTION	NET COST	PAYBACK	25-YR SAVINGS	MONTHLY
Cash	\$32,452	11.3 yr	\$52,329	—
Dealer loan, 7% / 15 yr	\$40,278	22.4 yr	\$11,138	\$485/mo

Most of that gap is not interest. Solar loans carry a **dealer fee** — the installer pays the lender for the low advertised rate and builds it into the price rather than showing it. It typically runs 15–30%. At 15% it costs \$7,826 here. Ask every installer for the cash price separately: a plain home equity line at a genuine 7% with no dealer fee beats almost any advertised "2.99% solar loan".

Prepared by SIA for a Massachusetts home, September 24, 2026. Every figure comes from the SIA Solar Design Studio and can be reproduced there for this address. Roof and shading from Google Solar API imagery; production from NLR PVWatts v8. Rate from RMLD tariff MDPU #317 and published

Illustrative sample of an SIA custom analysis - the client's address and roof imagery have been removed.

monthly adjustments. Incentives from DSIRE and RMLD's own programme terms, checked 24 September 2026. Installed price modelled for Massachusetts (DOE PVSCB), not a quote.

This is information, not financial advice. Tax treatment depends on your own circumstances and is worth confirming with your preparer. SIA is paid by no installer and sells no equipment.

SAMPLE