

Mt Zion solar energy system fact sheet

Components:

Photovoltaic modules: 74 Tier 1 Philadelphia 540 bifacial panels (540 W each)
Power optimizers: 37 SolarEdge P1100 units
Inverters: 2 SolarEdge 17.3KUS units
Rack system: TerraGen ballasted non-penetrating
Installation: fixed, south-facing, 20° tilt

Performance:

Total DC power: 39.96 kW
Total AC power: 34.6 kW
Est. annual production: 52,437 kWh
Annual usage (2022): 156,363 kWh (renewable offset = 33.5%)
Annual usage (2023): 104,802 kWh (renewable offset = 50.0%)
Annual usage (2024): 119,213 kWh (renewable offset = 44.0%)

Financial:

Total system cost: \$ 115,450 (all parts and labor)
Solar for Good grant: 10,490 (value of 37 solar panels donated)
Focus on Energy rebate: 5,495 (solar PV incentive for businesses)
IRS direct payment: – 41,984 (30% of installed system cost + 10% energy community add-on)
Net cost: \$ 57,481 (financed by Legacy Solar Co-op 12-yr loan at 6.75%)
Est. annual savings: \$ 8,337.48 (using average utility rate = \$0.159/kWh for 2023 and 2024)
Annual payments: – 7,028.76 (first year amortization: \$3232.72 principal + 3796.04 interest)
Net 1st year savings: \$ 1,308.72 (subsequent years should be greater, because utility rates will rise)
Est. 30-year savings: \$ 213,334 (assumes 52 MWh/yr, utility rate increase 3%/yr, panel degradation 0.5%/yr)
Est. 30-year cost: – 90,869 (net cost plus financing fees, assuming 12-yr amortization)
Net 30-year savings: \$ 122,465 (minimum amount saved by avoiding purchase of electricity produced onsite)
Return on investment: 135% (ratio of net savings to cost)

Timeline:

Contract signed: 05/10/2024
Construction began: 11/20/2024
System commissioned: 12/13/2024
Inspection passed: 12/16/2024
First loan payment: 02/01/2025
Est. final loan payment: 01/01/2037 (will be earlier due to extra principal payments from congregational donations)

Project partners:

System design/install: Endries Solar Electric LLC, 200 S Business Park Dr #5, Oostburg, WI 53070
Financing: Legacy Solar Wisconsin Co-operative, PO Box 7622, Madison, WI 53707
Solar for Good grant: RENEW Wisconsin, 214 N Hamilton St #300, Madison, WI 53703