



DUAL-STREAM ROI & ENERGY PAYBACK ANALYSIS

BIPV + Warm-Edge VIG
Integrated ROI Engine

US / Imperial / USD | CIGS (Thin-Film) | VLT 20%

APPLICABLE STANDARDS & REFERENCES

- ASHRAE Fundamentals 2021 \$18
- ASHRAE 90.1-2022 \$5.5
- EN ISO 10077-1:2017
- LEED v4.1 EA
- NREL TMY3

COMBINED ANNUAL SAVINGS

\$798

Thermal + PV revenue

Payback: 48.2 years

STREAM 1 - THERMAL (VIG)

\$355

2.5 MWh/yr saved

Heat: 2.0 MWh/yr Cool: 498 kWh/yr

STREAM 2 - PV GENERATION

\$443

2.8 MWh/yr generated

CIGS (Thin-Film)



PROJECT INPUTS

Glazing area	500.0 ft2
BIPV module type	CIGS (Thin-Film)
VLT (visible light transmittance)	20%
Facade orientation	South (optimal)
Glazing tilt	Vertical facade (90deg)
Baseline glazing U	0.4 Btu/h.ft2.F
THERMGLASS VIG U	0.13 Btu/h.ft2.F
U-value improvement	0.270 Btu/h.ft2.F (68%)
Climate	IECC Zone 5
Heating fuel	Natural gas
Electricity tariff	\$0.16/kWh
VIG premium	\$22/ft2
BIPV module premium	\$55/ft2
Discount rate	6.0%
Analysis period	25 years

STREAM 1 - THERMAL SAVINGS (VIG INSULATION)

HEATING SAVED 2.0 MWh/yr per year	COOLING SAVED 498 kWh/yr per year
THERMAL SAVINGS \$355 per year	TOTAL THERMAL 2.5 MWh/yr delivered energy/yr

STREAM 2 - PV GENERATION (BIPV MODULE)

ANNUAL PV YIELD 2.8 MWh/yr per year	PV REVENUE \$443 per year
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COMBINED ANALYSIS

TOTAL ANNUAL SAVINGS

\$798

thermal + PV

SIMPLE PAYBACK

48.2 years

Within building lifecycle

VIG INVESTMENT

\$11,000

warm-edge premium

BIPV INVESTMENT

\$27,500

module premium

NPV AT 10 YR

\$32,624 (neg)

6.0% discount

NPV AT 15 YR

\$30,746 (neg)

6.0% discount

NPV AT 25 YR

\$28,295 (neg)

analysis period

ANNUAL CO2 AVOIDED

2.3 t CO2

thermal + PV combined

LIFETIME CO2 (25 YR)

58.6 t CO2

total avoided emissions