



# ThermKool™ Anonymized Case Study

Residential Solar-Assisted Peak Cooling Load Reduction

## Executive Summary

This anonymized case study documents measured performance from a residential air-conditioning installation utilizing a solar-assisted peak load reduction module operating in parallel with a conventional vapor-compression system. The system was evaluated under real-world operating conditions and demonstrates substantial reductions in peak cooling energy demand and total daily electrical consumption during periods of high solar availability.

## System Overview (Anonymized)

- Residential multi-zone split-system air conditioning installation
- Approximate capacity: 48,000 BTU (4 tons)
- Climate: Hot, high-solar-availability region
- Operation: Cooling demand concentrated during daylight hours
- Integration: Retrofit, parallel operation with existing equipment
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## Observed Performance

- Measured reduction in total daily electrical consumption of approximately 50–60% during solar-active periods
- Compressor runtime reduced in both duration and intensity during peak heat hours
- Remaining energy consumption attributable to typical household base loads
- Effective operation observed over an average of approximately six hours per day (conservative estimate)
- Performance repeatable across multiple observation days
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## Key Implications

- Peak electrical demand reduction during highest-cost grid hours
- Lower operating stress on compressor and associated components
- Potential for reduced maintenance frequency and extended equipment service life
- Strong alignment with grid resilience and demand management objectives
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## Approved Public / Marketing Claims

- Demonstrated reduction in peak cooling-related electrical demand during daylight hours
- Measured residential installations have shown substantial reductions in total daily energy consumption under favorable solar conditions
- Retrofit-compatible with existing vapor-compression air-conditioning systems
- No batteries or inverters required
- Performance varies by climate, system configuration, and usage patterns