Modern Thermal Design

"Control Your Energy Destiny, or Someone Else Will."

PROJECT CASE STUDY • SOLAR THERMAL BOILER PREHEAT

SunQuest 250™

Solar thermal savings with meaningful workforce impact.

A 400-panel ***SunQuest 250™*** solar thermal installation at Ross Correctional Institution demonstrates how solar hot-water preheat can reduce utility exposure while supporting workforce-development goals.

Solar Thermal Designed for a High-Demand Facility.

Ross Correctional Institution in Chillicothe, Ohio is a state prison operated by the Ohio Department of Rehabilitation and Correction. With eight cell houses and an average daily population of approximately 1,900 offenders, the facility has substantial domestic hot-water and space-heating requirements. Annual natural gas costs were approximately $700,000, creating a clear need to reduce operating expenses while advancing correctional-sustainability goals.

WHY IT MATTERS

◉ **LOWER FUEL DEMAND**

↗ **BUILT FOR SCALE**

✷ **RENEWABLE THERMAL ENERGY**

◊ **WORKFORCE DEVELOPMENT**

Solar preheat reduces the heat load carried by existing natural-gas boiler equipment.

The system serves 32 hot-water boilers across eight cell houses.

Capture solar energy for a practical, high-volume hot-water application.

A select crew of offenders received hands-on solar thermal installation training.

HOW THE SUNQUEST 250™ SYSTEM WORKS

Solar Heat. Boiler Preheat. Reduced Fuel Load.

The ***SunQuest 250™*** system captures solar thermal energy and uses it to preheat incoming water before it reaches the facility's existing boilers.

01. CAPTURE

400 Solar Panels

The solar thermal array collects renewable heat.

02. TRANSFER

Heated Water Loop

Collected heat is transferred into the incoming-water preheat loop.

03. PREHEAT

32 Hot-Water Boilers

Preheated incoming water reduces the heating work required from each boiler.

04. SAVE

Lower Gas Demand

Existing boilers use less fuel to meet hot-water and space-heating needs.

400 PANELS. 32 BOILERS. EIGHT CELL HOUSES. ONE INTEGRATED SOLAR THERMAL STRATEGY.

SUNQUEST 250™ SOLAR THERMAL | **RENEWABLE HEAT FOR HIGH-DEMAND FACILITIES.**

Ross Correctional Performance Signals

The Ross Correctional project demonstrates a practical approach to reducing thermal-fuel demand at a large, high-use institutional facility while creating a platform for meaningful hands-on training.

1,900	8	32	≈$700,000
average daily offender population served	cell houses supported by the installation	total hot-water boilers receiving incoming-water preheat	annual natural-gas spending before the solar thermal project

Built for Institutional Priorities

The Ross project was structured to meet multiple goals at once: control operating costs, advance correctional sustainability, and expand green-technology vocational training opportunities.

Budget & Operations Teams

Use solar boiler preheat to reduce the amount of purchased fuel required to deliver large volumes of hot water.

Sustainability Leaders

Bring renewable energy into a practical, high-impact thermal application that complements facility infrastructure.

Workforce & Vocational Programs

Give selected participants hands-on experience with solar thermal installation processes and green-technology work.

Institutional Facility Owners

Partner with MTD for a coordinated approach to evaluate, design, and implement solar thermal projects.

High-Value Solar Thermal Applications

The same solar thermal approach can be adapted for facilities with substantial and recurring hot-water, boiler-preheat, and space-heating needs.

Boiler Preheat

Reduce the fuel load required to bring incoming water to operating temperature.

Domestic Hot Water

Support high-volume hot-water demands in institutional, hospitality, and multifamily facilities.

Space Heating

Contribute renewable heat to commercial and institutional heating loads.

Corrections & Campuses

Serve large facilities with predictable hot-water demand and centralized infrastructure.

Healthcare & Hospitality

Support thermal loads in facilities where hot water is essential to daily operations.

Industrial Facilities

Use renewable thermal energy for appropriate process or facility heating applications.

TURN SUNLIGHT INTO LOWER THERMAL FUEL DEMAND.

Ready to evaluate solar thermal for your facility? Contact Modern Thermal Design.

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Ross Correctional project figures are based on the supplied case-study document. Final outcomes vary by hot-water demand, climate, system design, fuel costs, operating conditions, and facility infrastructure.