



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

PROJECT SPOTLIGHT • INDIANAPOLIS INTERNATIONAL AIRPORT

SOLAR THERMAL AIRPORT HEAT

Renewable heat. Operational readiness. Proven results.

MTD supported the first of a three-stage renewable-thermal initiative at Indianapolis International Airport—an on-site solar-thermal and storage platform designed to keep critical snow-removal equipment ready for rapid response.

Reliable Renewable Heat for Airfield Operations.

In October 2021, the Indianapolis Airport Authority commissioned a solar-thermal system at Indianapolis International Airport's Consolidated Snow Removal and Equipment Storage facility. The 74,000-square-foot facility houses critical snow-removal equipment, including 13 snowplows, that must be prepared for rapid deployment during winter weather events. The completed system was the first stage of a three-stage airport renewable-thermal initiative; two stages have now been completed.

WHY IT MATTERS



RENEWABLE HEAT

70 solar-thermal collectors deliver reliable heat—even under cloudy, low-DNI winter conditions.



THERMAL STORAGE

A 10,000-gallon hot-water tank stores daytime solar heat for evening and off-sun operation.



LOWER ENERGY COSTS

The project reduced facility energy costs by more than 50%.



OPERATIONAL READINESS

The system helps maintain equipment temperature and rapidly restore the facility to 70°F after vehicle movement.

HOW THE SOLAR-THERMAL PLATFORM WORKS

Capture. Store. Deliver. Supplement.

Roof-mounted collectors capture solar energy, preheat a large hot-water storage tank, and supply the facility's hydronic heating loop. Natural-gas boilers operate only as supplemental heat when needed.

01. CAPTURE

70 Collectors

Roof-mounted solar-thermal collectors produce renewable heat.

02. STORE

10,000 Gallons

A large hot-water storage tank captures thermal energy during the day.

03. DELIVER

Hydronic Loop

Stored hot water serves the facility's space-heating system.

04. SUPPLEMENT

Gas Boilers

Boilers operate in low-burn mode or not at all when solar heat meets demand.

70 COLLECTORS. 10,000 GALLONS OF THERMAL STORAGE. UP TO 185°F HEAT.

Measured Outcomes

During the December 2021–March 2022 winter period, the solar-thermal collectors supplied 70% of the facility’s heat demand. This enabled the natural-gas boilers to operate only in low-burn mode or not at all, while the system maintained the conditions required for snow-removal equipment to start readily and supported quick temperature recovery after vehicles entered and exited the building.

70%	>50%	574 tCO ₂	0
of facility heat demand supplied in the reported winter period	reduction in facility energy costs	annual avoided carbon-dioxide emissions	reported solar-thermal O&M costs to date

Designed for Dependable Service

The system was designed to provide an average heat load of 1.54 million Btu per hour at temperatures up to 185°F. Its simple collector-and-storage architecture limits moving parts and maintenance requirements while providing dependable thermal energy in winter conditions. Facility personnel received basic training to support future maintenance, and the project report states that the collector system had required no maintenance to date.

Winter-Ready Heat The solar-thermal system supports equipment storage and rapid readiness during snowstorm response periods.	Storage Extends Value Preheating thermal storage during the day allows renewable heat to be used into the evening or whenever the sun is not shining.
Low-Maintenance Architecture System simplicity and fewer moving parts reduce the likelihood of breakage and minimize O&M needs.	Replicable Campus Model The initial installation created the foundation for additional airport applications, demonstrating how renewable heat can scale across a complex operating campus.

A Three-Stage Renewable-Thermal Initiative

The airport expanded its use of the technology after the first project’s success. Following the original 70-collector installation, the airport installed 10 additional collectors for domestic-hot-water heating at an airport fire station and proceeded with a third application using 15 collectors for radiant-floor heating at a new airfield deicing-materials storage building. Together, the completed first and second stages demonstrate the versatility of solar thermal and thermal storage across different airport energy needs.

STAGE 1 • COMPLETED	STAGE 2 • COMPLETED	STAGE 3 • IN PROGRESS*
Snow-Removal Facility 70 collectors + 10,000-gallon thermal-storage tank serving the hydronic space-heating loop.	Airport Fire Station 10 additional collectors installed for domestic-hot-water heating.	Deicing Materials Storage 15 collectors planned for radiant-floor heating at the new storage building.

CAPTURE RENEWABLE HEAT. STORE THERMAL ENERGY. KEEP CRITICAL OPERATIONS READY.

Interested in solar thermal and thermal-storage solutions for critical facilities? Contact Modern Thermal Design.

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Source: Renewable Thermal Collaborative, "Solar Thermal at the Indianapolis International Airport," July 2024. *The supplied case study states that the third installation was in progress in 2024. User-provided context indicates this three-stage program has two stages completed. Project performance and operating figures are reported case-study results; they are not guarantees for future projects.