

## CENTERSQUARE: DATA CENTER COOLING OPTIMIZATION SAVES ENERGY AND CUTS COSTS IN MESA, AZ

SECTOR	LOCATION	PROJECT SIZE	FINANCIAL OVERVIEW
Commercial Data Center	Phoenix	154,000 sq ft	\$170,000

### BACKGROUND

Collaborating with an engineering firm and their local electric utility, Centersquare conducted an energy audit at their Mesa, AZ site to pinpoint opportunities for energy savings without compromising reliability. Audits found optimization efforts for both air and water cooling systems, specifically focusing on reducing airflow and resetting chilled water temperatures. Through a partnership with the local utility, Centersquare secured \$75,000 in financial incentives through a utility energy efficiency program. Measurement and verification results showcased annual electric savings exceeding 1,240 MWh, equating to over \$100,000 in annual electricity cost savings.

### SOLUTIONS

As a result of the energy audit, the engineering firm proposed two primary measures: airflow optimization in the data hall and chilled water optimization in the chiller plant. Implementation involved deploying a dynamic cooling management system to regulate Computer Room Air Handler (CRAH) supply fans based on real-time temperature data. This system, leveraging artificial intelligence and machine learning, dynamically adjusts cooling to align with IT loads as colocation customer's IT heat loads change over time, resulting in substantial energy savings.

**Table ES-1. Pre-Implementation Retrocommissioning Measure Estimates**

RCM No.	Measure Description	Peak Demand Savings (kW)	Annual Energy Savings (kWh/yr)	Annual Electric Energy Cost Savings (\$/yr)	Implementation Cost (\$)	Simple Payback w/o Rebate (yrs)	SRP Rebate (\$)*	Simple Payback after Rebate (yrs)
1	Data Hall: Airflow Optimization	141.59	1,240,369	\$ 107,044	\$ 150,000	1.4	76,177	0.7

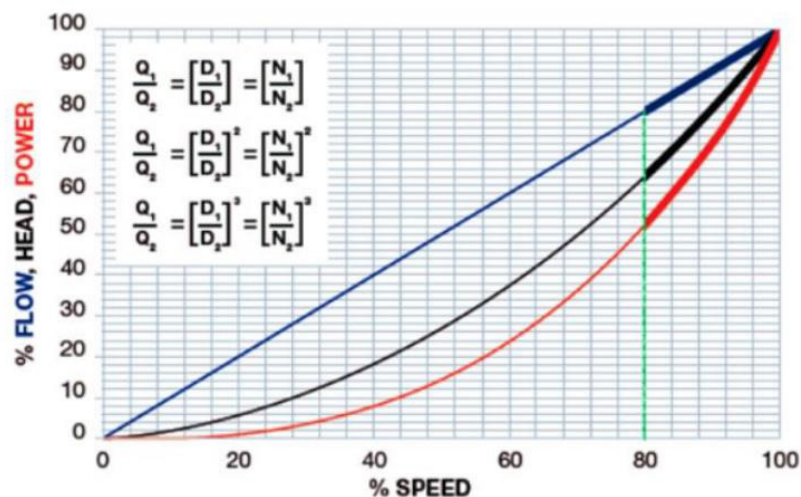
Substantial rebates from the local utility encouraged implementation and supported the project timeline, from approval to installation. Staffing involved both internal data center personnel and third-party technicians.

Implementation of the cooling optimization project at Centersquare faced barriers including initial cost approvals, delays in utility administrative processes, and the need for permission and rebate access shared with their tenant. Internal teams at Centersquare managed significant planning and administrative duties alongside third-party technician supervision. Initial challenges in the measurement and verification process led to uncertainty regarding the project's effectiveness and eligibility for utility grants due to insufficient data.

Upon audit completion, the engineering firm conducted a measurement and verification plan, confirming over 1,240 MWh of annual energy savings, ensuring a favorable payback. Centersquare's success earned them recognition from their local utility. The dynamic cooling system implementation resulted in significant energy savings to the non-IT energy load and increased IT equipment deployment capacity.

### ***Sustained Impact***

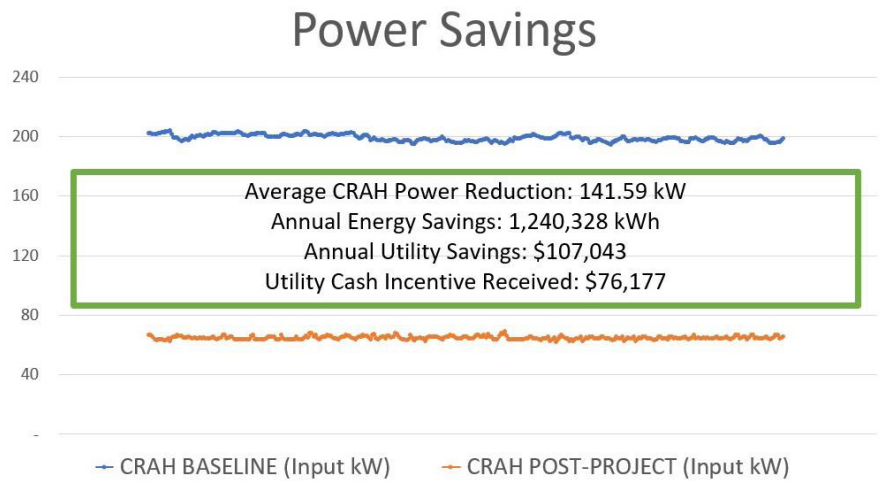
Centersquare's Mesa site's energy-efficient measures have yielded significant organizational savings by optimizing fan speeds and managing electric loads, unlocking trapped electric capacity for greater IT equipment deployment. Leveraging fan affinity laws demonstrates a sustainable approach to reducing energy consumption while maintaining operational efficiency.



## OTHER BENEFITS

The dynamic cooling management system's adaptability to IT equipment load changes guarantees sustained energy savings while identifying additional efficiency opportunities like server virtualization, humidity set points, and lighting improvements.

Centersquare's energy efficiency retrofit at the Mesa data center demonstrates a strategic approach to sustainability, balancing reliability and environmental responsibility. Through collaboration with engineering firms and utility providers, Centersquare has not only achieved significant energy savings but demonstrated sustained impact in data center operations and a replicable pathway to energy reduction.



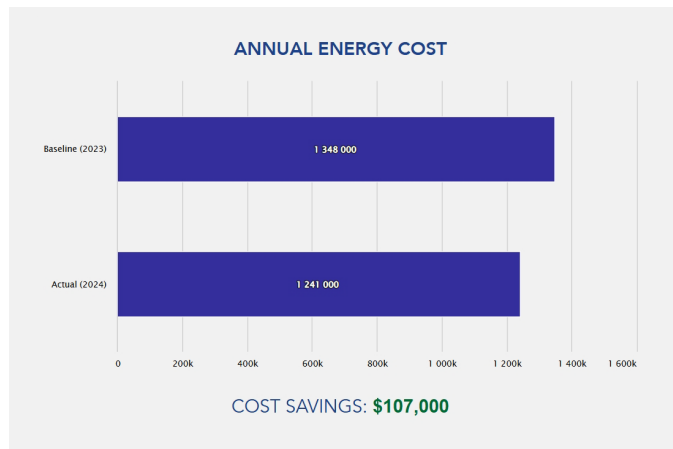
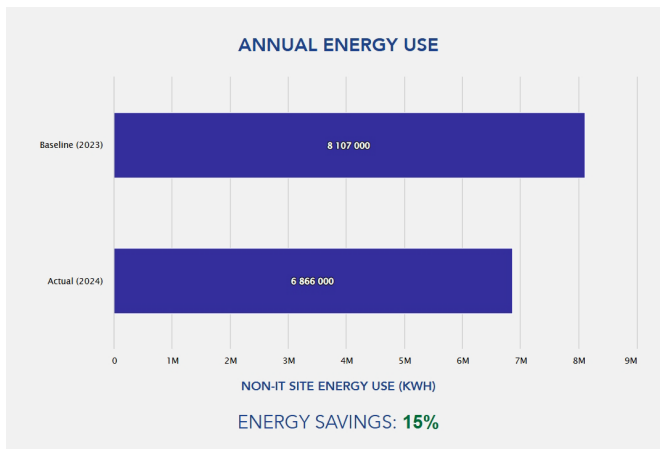
## IMAGE GALLERY



### ANNUAL ENERGY USE (Non-IT Source Energy Use kBtu)

Baseline	77,459,700
Actual	65,607,850

ENERGY SAVINGS:  
15%



## REFERENCES

- To view case study on Better Buildings' website, [click here](#).
- To learn more about the U.S. Department of Energy's Better Buildings initiative, [click here](#).