



ENHANCING HOSPITAL EFFICIENCY

The Benefits of Heat Recovery Chillers in
Healthcare Facilities

MAY 20 2025



SPEAKERS



STEPHEN CAUDILL

Ecosystem Energy Services
Senior Construction Engineer
& Regional Manager Midwest



RICK NIESE

The Ohio State University/Wexner Medical Center
Facilities Operations and Development
Lead Energy Engineer

THE OSU WEXNER MEDICAL CENTER

Mission: Advancing lives through research, education, and patient care

- 30 buildings at 7M sqft
- 7 hospitals, 1.4k staffed beds, 22k staff

FY24 Highlights

- 60k+ admissions
- 3.2M outpatient visits

Future Growth

- 1.9M sqft patient tower opening in 2026



ECM Program

The OSU's Energy Goals

- Carbon neutrality by 2050
- Cultivate sustainable energy leaders
- Drive energy innovations

ENGIE Partnership

- 50-year agreement starting in 2017
- Manages power, heat, and cooling at OSU's Columbus campus

Ecosystem's Role

- Improve energy efficiency by at least 25%

\$84M
Investment



INTEGRATED ENGINEERING + CONSTRUCTION

ECOSYSTEM



1993

FOUNDED IN

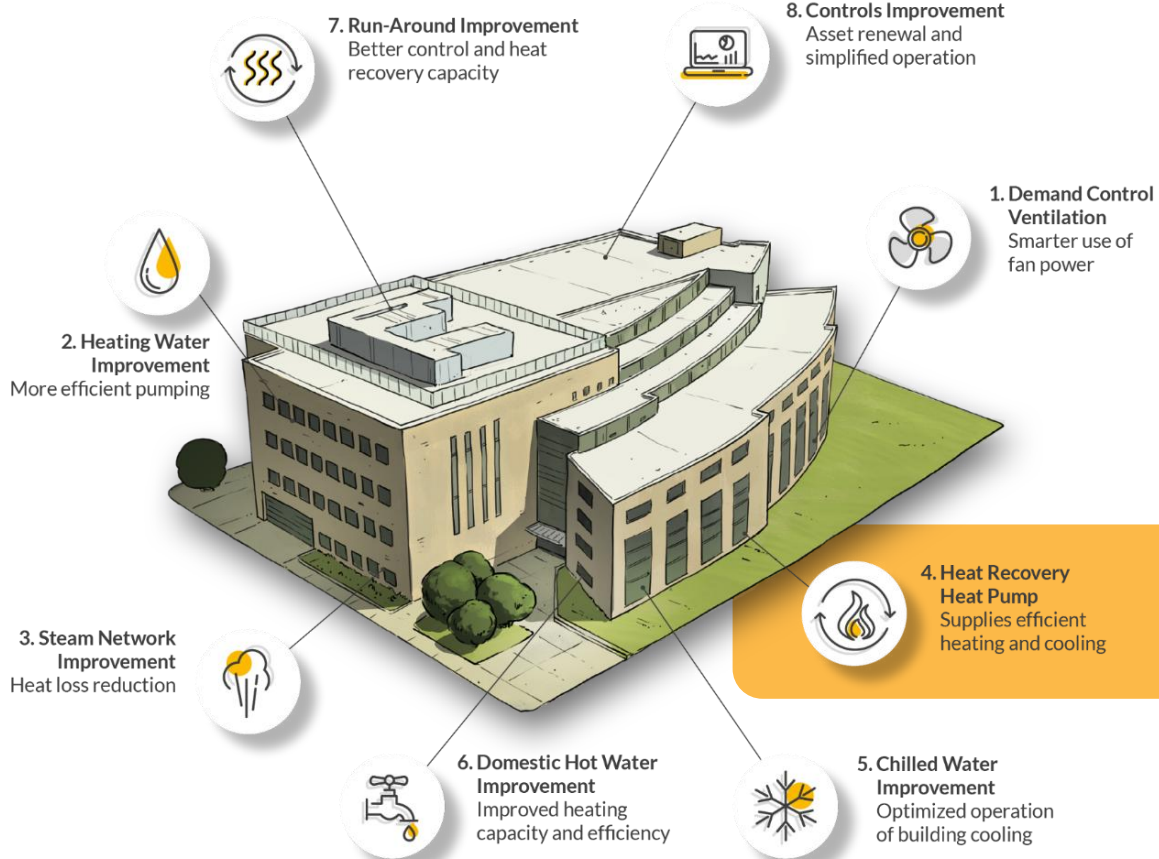
101%

SAVINGS ACHIEVED

303

PROJECTS COMPLETED

ECMs



The background is a solid yellow color. It features several large, abstract, curved shapes in a lighter shade of yellow, which appear to be stylized representations of energy or flow. These shapes are positioned around the central text, creating a sense of movement and focus.

HEAT RECOVERY CHILLERS

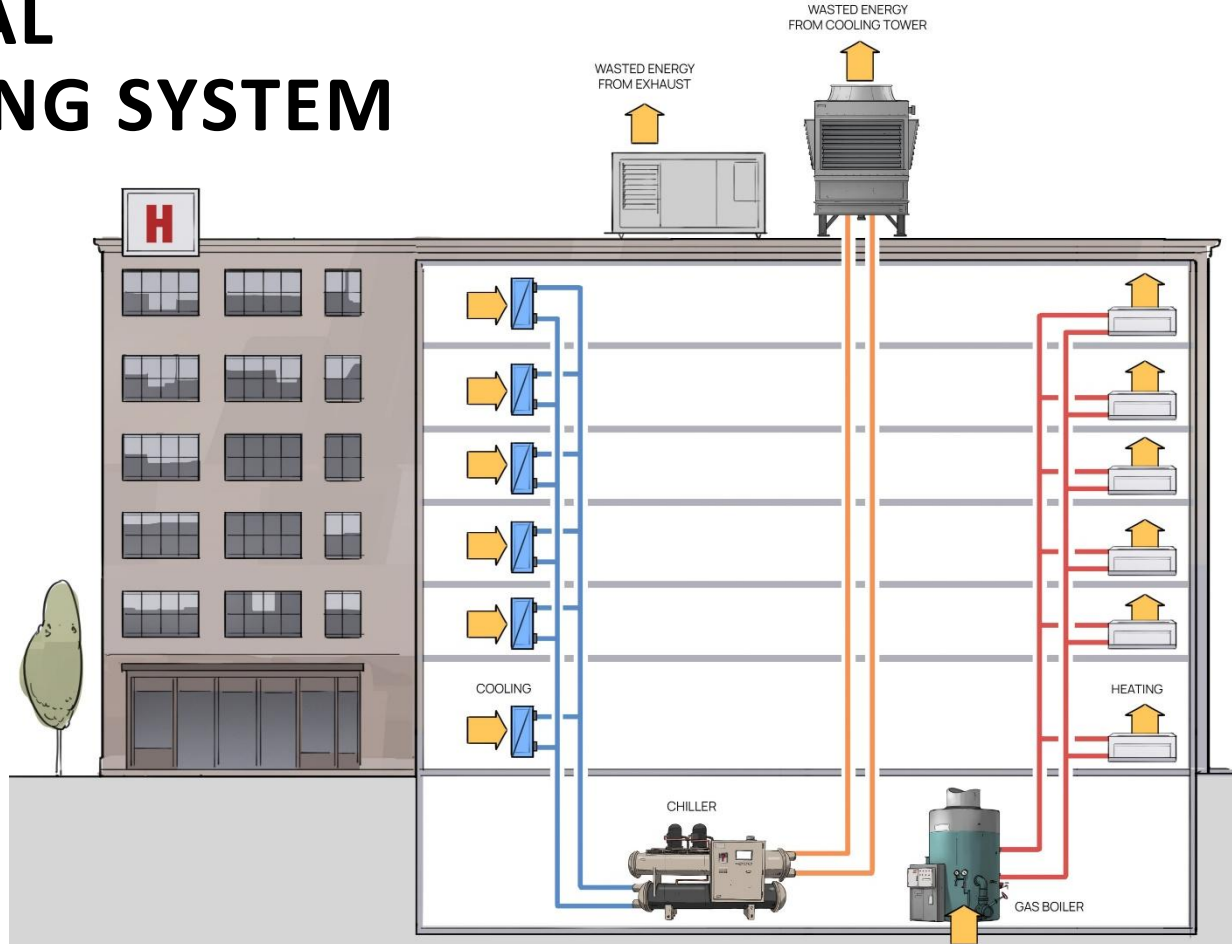
Equipment	Overall Efficiency
Heat Recovery Chiller	600%
Steam Boiler	70%
Cogeneration	88%

HRC NETWORK

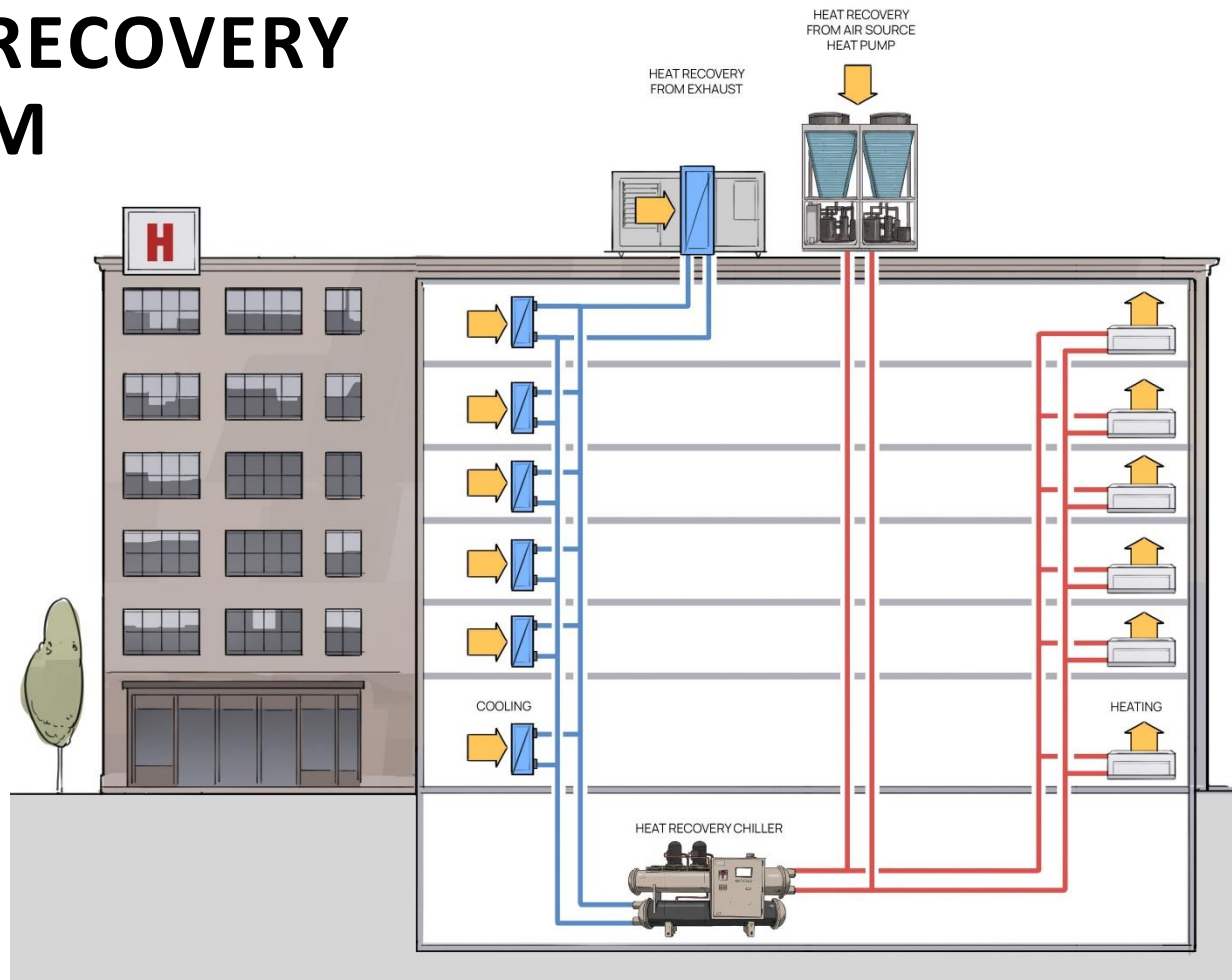


OVERALL NETWORK EFFICIENCY: 600% (COP 6)

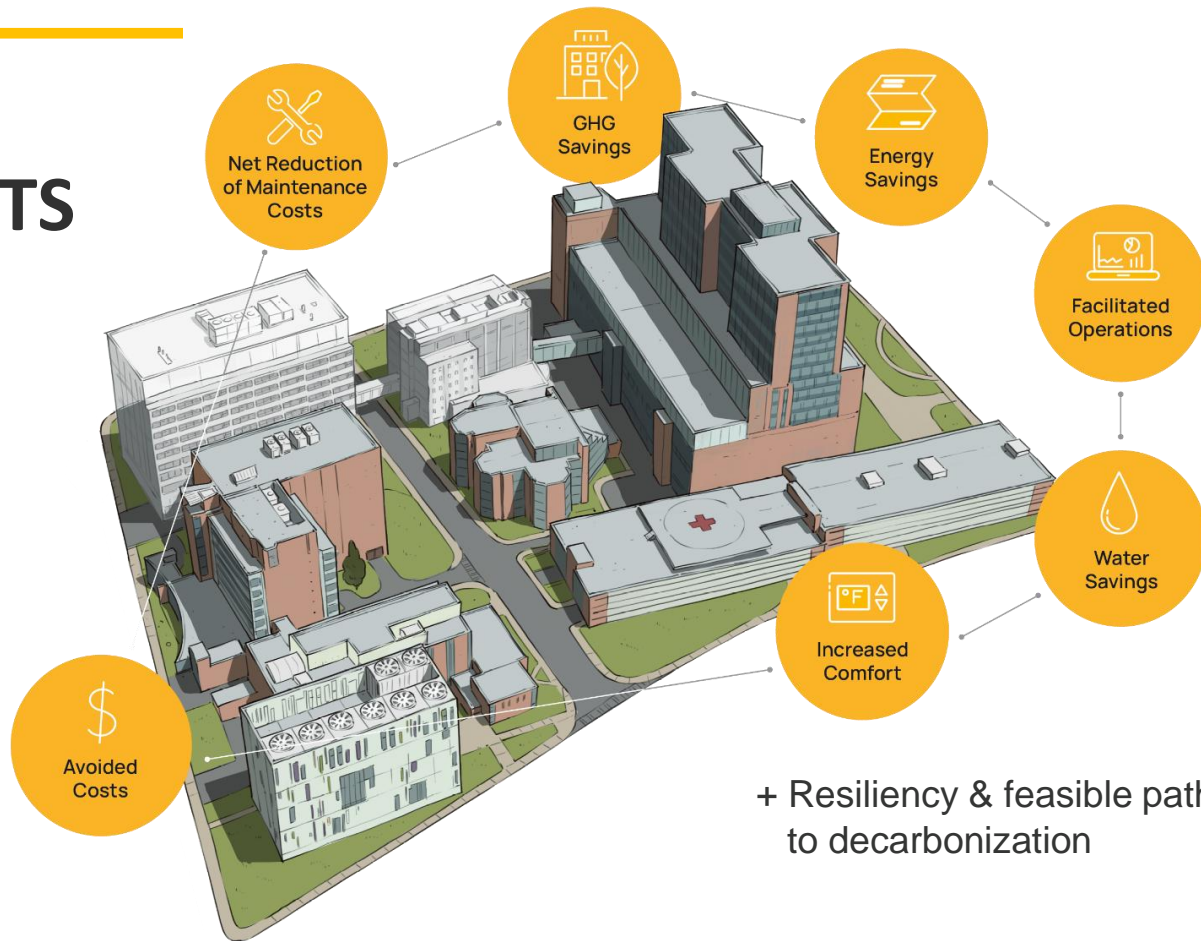
TYPICAL COOLING SYSTEM



HEAT RECOVERY SYSTEM



OTHER BENEFITS

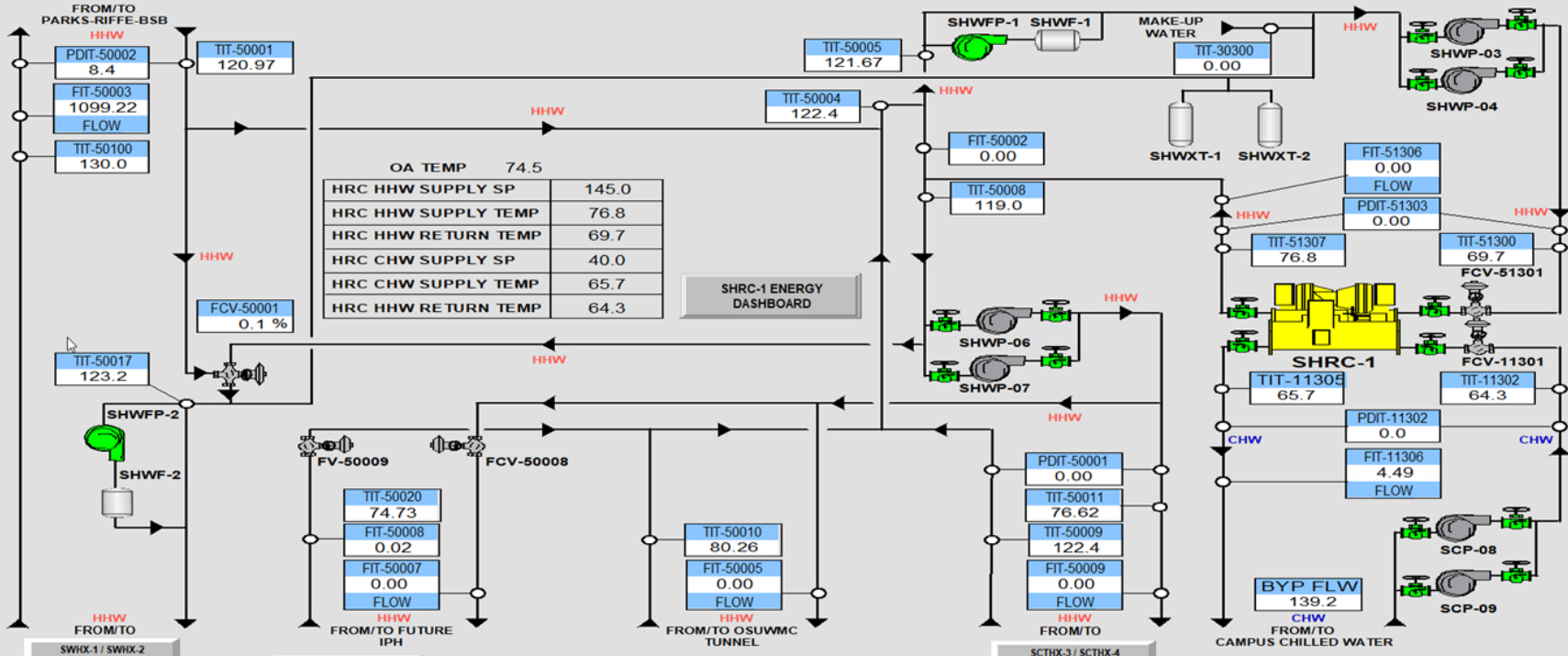


+ Resiliency & feasible pathway
to decarbonization

South Campus Central Chiller Plant

- Annual heat offsets 23% of Med Center's steam usage
- York CYK 1,500 tons nominal
- Heat output 26,000 MBH
- 7.6 MW equivalent boiler (2.3 MW of input)
- Winter cooling load optimized with modulating capacity
- Live system installation with no disruption
- Lessons learned: Controls limitation of large tonnage HRC





SHRC-1 ENERGY DASHBOARD	
OA TEMP	74.5
HRC HHW SUPPLY SP	145.0
HRC HHW SUPPLY TEMP	76.8
HRC HHW RETURN TEMP	69.7
HRC CHW SUPPLY SP	40.0
HRC CHW SUPPLY TEMP	65.7
HRC HHW RETURN TEMP	64.3

4/25/2025
12:49:04 PM

NAVIGATION

388 SCCCP: SHRC-1



LOGIN
LOGOUT

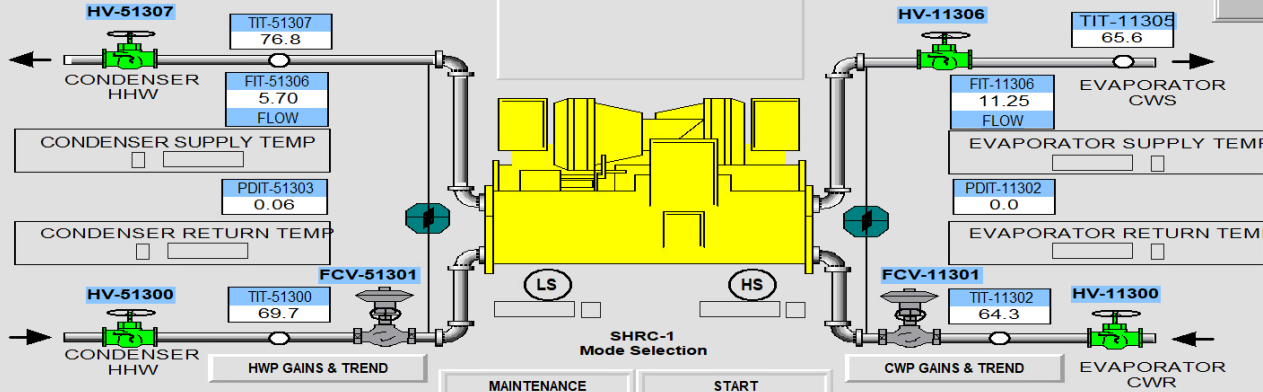
UTIL081UTILADMN



FAULT CODE: 0

SHRC-1 Energy Dashboard

- RUNTIME
- STARTUP
- SHUTDOWN



FCV-51301

AUTO

MANUAL

MAINTENANCE

OP: 0.0

FB: 0.0

FCV-11301

AUTO

MANUAL

MAINTENANCE

OP: 0.0

FB: 0.0

SHRC-1 Mode Selection

MAINTENANCE

SEMI-AUTO

START

STOP

SCTHX-3 / SCTHX-4 DETAIL

(SEMI-AUTO) Low HRC Condenser Load: The HRC needs to always be loaded at a minimum of 50%, either on the condenser or the evaporator. Heating and Cooling setpoints and pumps operation remain unchanged
 If the HRC's load (%) is less than LOAD SETPOINT % (adj.):
 FCV-50010 and FCV-50011 are commanded to 10%
 FCV-21303 and FCV-21304 are modulated to maintain HRC Load (%)
 If the HRC's load (%) is greater than LOAD SETPOINT % by 5°F for 5 minutes all valves close:

$$\text{ACTUAL LOAD \%} = \left(\frac{\text{FIT-51306}}{\text{MAX CAP}} \right) \times 100$$

0.27 = (0.00 / 25.500) x 100

LOAD % SETPOINT 50.0

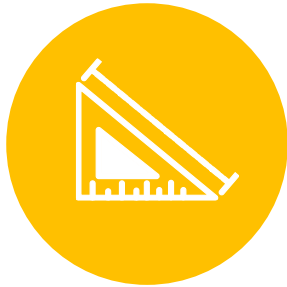
- EQUIP LEGEND
- SHRC P&ID
- CW SOUTH
- SWHX-1/2
- CW NORTH
- SCTHX-3/4
- TW SOUTH
- SHRC-1 DETAIL**
- TW NORTH 1
- TW NORTH 2
- MAIN
- EQUIPMENT OVERVIEW

Jameson Crane Outpatient

- HRC reduces building energy use by approx. 31%
- Multistack MSH070 70 tons nominal
- Sizing based on available heat recovery (ventilation exhaust)
- Proof of concept for healthcare applicability



LESSONS LEARNED



**PROPERLY SIZED
EQUIPMENT**



**ONGOING
COMMISSIONING**



**SELECTING THE
RIGHT EQUIPMENT**



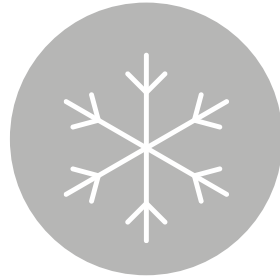
HOLISTIC APPROACH

GETTING STARTED

HOSPITAL HRC



**BASE COOLING
LOADS/EXHAUST**



**EXISTING CENTRAL
HW & CW**



**CHILLER FAILING
OR REACHING END-
OF-LIFE**



**SUFFICIENT
ELECTRICAL
INFRASTRUCTURE**

THANK YOU!

STEPHEN CAUDILL

scaudill@ecosystem-energy.com

1-614-395-1324

RICK NIESE

richard.niese@osumc.edu

1-614-366-8288



ecosystem-energy.com