

LUC Quinlan Life Science Heat Recovery Chiller

Project Highlights and Results

- Completed Energy Audit and Heat Recovery Study including review of HVAC processes, BAS and control components, development of Energy Conservation Measures (ECMs), and performed energy modeling.
- ECMs included conversion of select laboratories to VAV, recommissioning the control system and sequences, and the use of a heat recovery runaround loop and heat recovery chiller to achieve \$242,000 in annual energy cost savings
- Designed heat recovery runaround loop to recover energy from existing laboratory exhaust system to preheat incoming makeup air
- Designed heat recovery chiller to repurpose otherwise wasted heat rejection from the chiller for laboratory reheat during cooling months.



Project Background

Owner:	Loyola University Chicago (LUC)
Location:	Chicago, IL (Lake Shore Campus)
Team/Team Lead:	Don McLauchlan, Brian Malone, Dustin Langille, Cem Diniz
Elara Role:	MEP Engineer
Type:	Energy Retrofit
Construction Cost:	\$660,000

Project Overview

Building Type:	Higher Education, Laboratory
Building Attributes:	5-Stories (laboratories, classrooms); 134,000 SF
Initial Construction:	2004
MEPFPIT Systems:	HW boiler plant, Steam boiler for cage wash and sterilization, (3) AHUs and (6) MAUs with glycol HW coils and CHW

Innovation

- Developed Energy Audit and Heat Recovery Study that identified viable opportunities to improve energy efficiency and building operations.
- Implemented heat recovery runaround loop and heat recovery chiller to achieve \$62,000 in annual energy cost savings and \$85,900 in project incentive funding.
- Heat recovery runaround loop designed to recover energy from the building's laboratory exhaust system to preheat incoming makeup air. During the spring and fall when reheat loads are at their highest and cooling loads at their lowest, excess heat from the reheat loop is rejected to the laboratory exhaust air stream.
- Control sequences designed to reduce pump speed based on measured air and water temperature differentials resulting in energy savings and an hourly weighted sensible heat recovery effectiveness over 80% during the winter.
- The heat recovery chiller supplements campus cooling loads and provides laboratory reheat which allows the boiler plant to be shut down during summer months and reduces the load on the campus' central chilled water plant.