



# The NiSource CHP Packaged System Team

## Benefits of Packaged CHP Systems

### Capital Cost Reduction

Packaged systems can cut CHP system capital costs by 15% to 30%.

### Shorter & Less Expensive Installation

IES can reduce CHP system installation time by as much as two-thirds, and provide corresponding installation cost savings.

### Replicability

System designs are suitable for multiple applications in facilities around the country.

### Optimize Facility Energy Use

Packaged systems allow facility operators to manage power generation, cooling and heating to optimize energy use as well as reduce electricity use during peak periods.

### Simplified Systems

The use of exhaust-fired absorption chillers eliminates the need for steam/hot water generation equipment.

### Optimized Benefits

Using programmable controls and other technologies, the NiSource IES provides benefits customized to each individual facility.

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## Project Overview

NiSource Energy Technologies (NET), along with Rahmat Shoureshi, Controls Consultant, is developing, integrating, and packaging an Integrated Energy System (IES) that will optimize energy usage in facilities. An IES can yield significant energy and economic savings and provide extremely reliable power.

The team is designing the initial application for the hotel industry, with potential future applications in other industries with relatively high water heating needs, such as hospitals. The project builds on the earlier commercial success of a Combined Heat and Power (CHP) installation at a commercial business in Chesterton, Indiana. Initially, the system provided baseload electricity, heating, and plans to include absorption-based air conditioning. After a year of operation, NET expanded the system to include computerized isolation from the grid and plans to include dehumidification.



Experience at commercial CHP test sites developed by NET provides commercial operating information for the design of IES for its initial application - hotels.

## Objectives

### Total Building Integration and System Optimization

- The "CHP system" is the entire building, reflecting a comprehensive approach to system design.
- Total building integration incorporates concepts including sustainable architecture, building design, artificial intelligence, advanced controls, and interconnection with the larger grid.

The system integrates and optimizes energy options for specific facility energy use patterns including space heating (through multiple hydronic zones in the floor), thermal load from hot water heating, and swimming pool and spa heating.

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