

## PAPER OBJECTIVE

The intent of this paper is to evaluate the effectiveness of the designed mechanical system related to the goals of the building owners and designers. Through the process of proposing alternative systems to meet these goals, we can observe the true value of the proposed system, and recognize controlling factors for condominium HVAC. This building presents an optimum environment to study condominium mechanical systems, since the building owner and designer's goals reach beyond the typical condominium design.

***This project's design goals are:***

1. Sell condominiums in an area with a high demand for luxury apartments to gain a profit
2. Pursue a recognizable level of sustainability
3. Create a reputable product with good space conditions and controllability
4. Minimize building owner's responsibility after sales are complete

To evaluate how well these goals are met by the mechanical system, five finite indicators of success are used.

***The indicators of success are:***

- a. Total energy use for LEED rating
- b. Resident's utility and building fee costs
- c. Price of the total system to the building owner
- d. Condominium price to buyers
- e. Emissions

To determining the level of success by each indicator, several successive steps were used.

***The evaluation strategy is:***

- I. Make assumptions about the existing system and propose new systems that meet the design goals
- II. Create a building model in Trane TRACE energy model simulator
- III. Evaluate each system
  - Calculate energy and energy costs in TRACE
  - Supplement these results with calculations for additional equipment
  - Calculate external factors such as management and maintenance
  - Calculate building price, condo price, utility price, LEED rating, and emissions
- IV. Compare and analyze the results

By evaluating a condominium building in this way, we can recognize types of systems that should be applied to condominiums, and the controlling factors we should consider for improving the way they are designed.

