

Base Case: Packaged Terminal Heat Pumps

a. Total energy use for LEED rating

This Model was constructed exclusively to determine the LEED rating of the proposals. It was created using ASHRAE 90.1 Appendix G Performance Rating method, with packaged terminal heat pumps, rotating the building orientation, and using the minimum required envelope requirements for steel framed building. (E-4)

Apartment Lighting	344925
Air to air Heat Pumps	499049
Hallway Lighting	49631

Total Lighting kwhr	394556
Total Mechanical kwhr	499049

b. Resident’s utility and building fee costs

To simplify the calculations, the heating and cooling energy consumption was calculated as a whole for properties of a typical packaged terminal heat pump (E-4)

The typical expected monthly utility bills for two apartments (C-5b):

Apartment
2C

J	F	M	A	M	J	J	A	S	O	N	D	Total
\$112	\$167	\$112	\$219	\$143	\$164	\$187	\$193	\$146	\$185	\$253	\$112	\$1,992

Apartment 6A7B

J	F	M	A	M	J	J	A	S	O	N	D	Total
\$265	\$396	\$266	\$520	\$339	\$401	\$455	\$469	\$357	\$440	\$602	\$265	\$4,777

c. Price of the total system to the building owner

This could be perceived as the budget system for this building, and that is reflected in the equipment cost as well as the energy use. This price was calculated from RS means for all the necessary ducts, fans, HP’s. The total estimated price is under \$500,000. (C-6a)

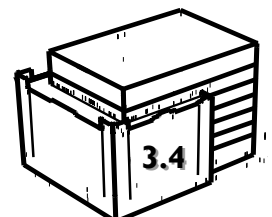
d. Condominium price to buyers

The corresponding condominium mechanical cost for any given apartment is between \$10,000 and \$30,000

e. Emissions

Electric emissions were estimated from US Department of Energy’s emissions from grid-source electric mix. The total emissions due to this central geothermal mechanical system are as follows, (not including apartment or shared spaces lighting) (C-4)

Pounds Particles per	Pounds SO2 per year	Pounds NO2 per year	Pounds CO2 per year
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	Year			
Base Case	321	3,761	2,214	688,472

