

CASE STUDIES



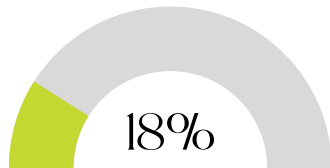
ENERGY SAVINGS

ARIZONA SINGLE-PHASE

16 SEER 5-ton Heat Pump (aged 10 yrs.) serving 1700 sq/ft in Phoenix, AZ.

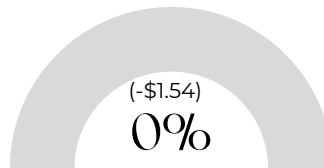
Liquid SEER 2023

Utility Cost Savings



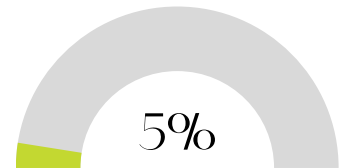
July

Avg. 4° cooler
482 kWh saved
= On Peak usage



Aug*

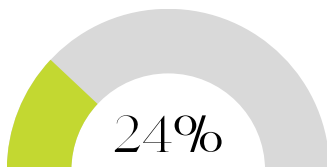
Avg. 7° hotter
only 10 kWh increase!
2% ↑ On Peak usage



Sep

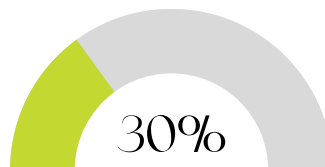
Avg. 2° hotter
+2 billing days in cycle
99 kWh saved
1% ↓ On Peak usage

*Note: outdoor temps above 95° cause equipment derating, which decreases BTU output per kWh and therefore increases energy consumption. The avg. temp for Aug 2023 was 101°. There is no way to predict the energy consumption of this unit while operating in derated conditions without Liquid SEER. Therefore, savings was calculated using ONLY the difference in actual kWh usage.



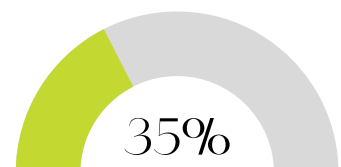
Oct

Avg. Temp equal
439 kWh saved
1% ↑ On Peak usage



Nov

Avg. 6° hotter
499 kWh saved
1% ↓ On Peak usage



Dec

Avg. 7° hotter
+1 billing day in cycle
510 kWh saved
2% ↓ On Peak usage

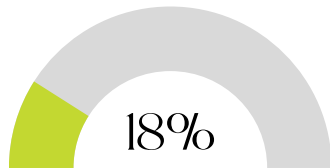


ENERGY SAVINGS

ARIZONA SINGLE-PHASE

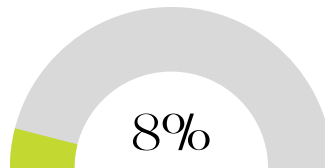
16 SEER 5-ton Heat Pump (aged 10 yrs.) serving 1700 sq/ft in Phoenix, AZ.

2024 Utility Cost Savings



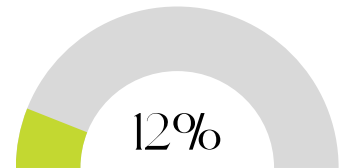
Jan

Avg. 2° **hotter**
+3 billing days in cycle
119 kWh saved
1% ↑ On Peak usage



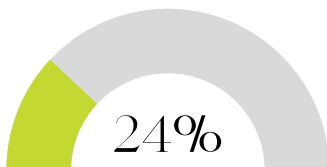
Feb

Avg. 3° **hotter**
+1 billing day in cycle
55 kWh saved
1% ↓ On Peak usage



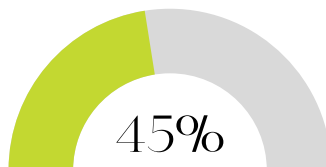
Mar

Avg. 7° **hotter**
+2 billing days in cycle
83 kWh saved
= On Peak usage



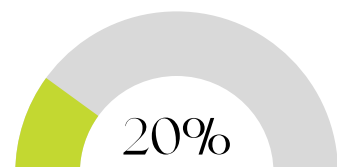
Apr

Avg. 1° **hotter**
+1 billing day in cycle
280 kWh saved
= On Peak usage



May

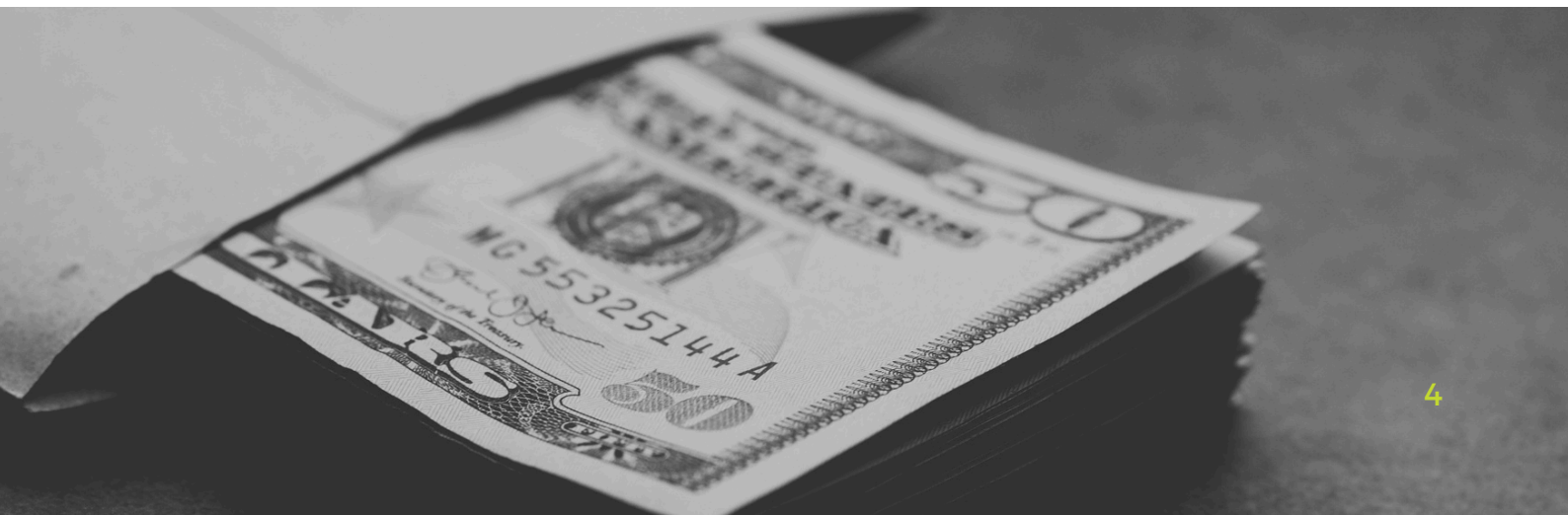
Avg. temp same
+1 billing day in cycle
766 kWh saved
3% ↑ On Peak usage



Jun

Avg. 3° **hotter**
+2 billing day in cycle
397 kWh saved
4% ↑ On Peak usage

20% ANNUAL SAVINGS

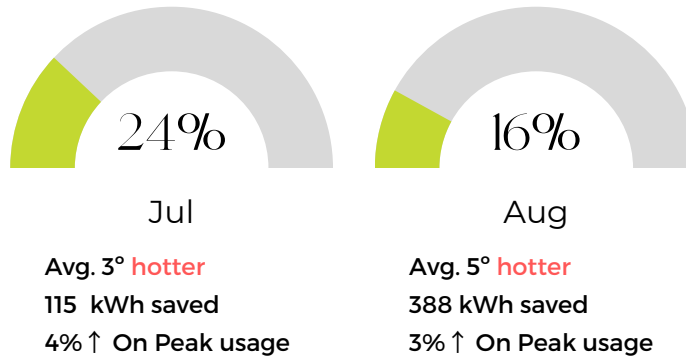


CONTINUED SAVINGS

Year 2

2024

Utility Cost Savings vs. 2022



ENVIRONMENTAL *Impact*



3,719 kWh Saved In Year 1



Equivalent 38 Trees Planted



670.00 Dollars Saved in Year 1
(at rate of .18 kWh)

SUMMARY

Utility costs at the case study location rose 22% over a year beginning Jul 2023 - Jun 2024 compared to the previous year. This increased rate was normalized for comparison to the Jul 2022 - Jun 2023 pre Liquid SEER utility costs.

The average daily temperature rose 2.25°F over a year beginning July 2023 - Jun 2024 compared to the previous year. This is particularly significant when considering equipment derating (that is mechanical performance output capability decreases linearly in correlation with the increase in outdoor ambient temperature.) AHRI rates equipment EER and SEER at an outdoor ambient temperature of 95° Fahrenheit and 50% humidity, anything above this increases energy consumption and decreases BTU/h output. This equipment was rated 16 SEER at the time of manufacture and was installed in an arid climate where coil corrosion is not performance inhibitive as is the case for coastal climates. However, the high temperatures are of particular concern for equipment performance and energy consumption. Records of the highest outdoor average temperature available at the time of this case study for this machine in operation prior to Liquid SEER installation was 95°F, which means, unfortunately, there was no way to compare this particular machine's performance against itself in derated conditions similar to those it operated in after being coated with Liquid SEER. Significant to this case, however, was the superior performance Liquid SEER created in equipment that was ten years old. Remarkably, this equipment was able to operate in a daily average temperature of 101°F while consuming a mere 2478 kWh when previous similar consumption at 2468 kWh occurred at only 94°F. While operating in harsher environmental conditions Liquid SEER was able to deliver an impressive 20% annual energy savings.

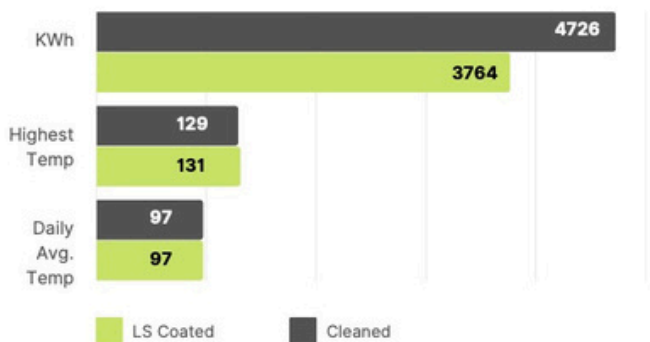
ENERGY SAVINGS

ARIZONA THREE-PHASE EQUIPMENT

Three 13 SEER systems (one 3-ton, one 3.5-ton, one 5-ton) Heat Pumps (aged 11 years)
serving approx 5,000 sq/ft in Phoenix, AZ

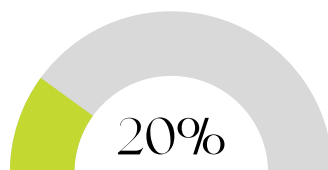
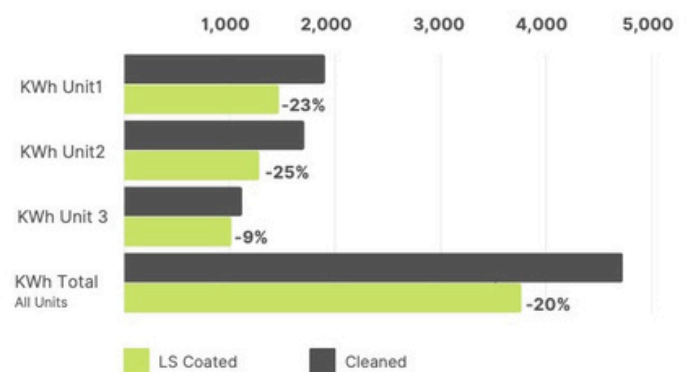
KWh Performance to Daily Outdoor Temperature

Same Units Cleaned vs. Same units Coated with Liquid SEER



Liquid SEER KWh savings

Cleaned Condenser Units compared vs. Same Condenser Units Coated With Liquid SEER. 3 weeks cleaned vs. 3 weeks coated.



kWh Savings

Total 3-week savings

