



Geothermal Loop Tax Incentive Case Study

Vyron is in the process of expanding their corporate office and installing a Geothermal WaterFurnace Heat Pump Chiller System.

Option 1: VAV Rooftop

- **Scope:**
 - **System Type:** (3) Rooftop units with single duct VAVs
 - **Energy Recovery:** Wheels integrated to Rooftops.
 - **Tonnage Each:** 10 TonR each
- **Annual Energy Consumption based on HAPP Model**
 - **Electricity:** 351,465kWh / Year
 - **Gas:** 10,120 Therms / Year
- **Expected Equipment Life:**
 - 10-15 years

Option 2: Geothermal and Central Heat Pump Plant

- **Scope:**
 - **System Type:** Dual heat pump chillers serving 4 pipe fan coils.
 - **Energy Recovery:** (2) Core ERV units
 - **Tonnage Each:** 15 TonR each
- **Annual Energy Consumption based on HAPP Model**
 - **Electricity:** 81,335 kWh / Year
 - **Gas:** 6,716 Therms / Year
- **Expected Equipment Life**
 - 25 + years

Payback Results

- Cumulative Payback Period (CPB) **2.6 Years**

	10-YEAR	20-YEAR
Return on Investment (ROI)	see value per year	see value per year
Total Return on Investment	126.8%	391.5%
Annualized Return on Investment	8.5%	8.3%
Internal Rate of Return (XIRR)	27.3%	30.2%
Net Present Value (NPV)	\$ 161,591	\$ 326,132
Modified Internal Rate of Return (XMIRR)	14.9%	14.3%
Savings-to-Investment Ratio (SIR)	1.5	1.9

****Assumptions listed on the back**

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Payback Assumptions

- Initial Investment: Rooftop subtracted from Geo Option
- Discount Rate: 12%
 - Definition: **the rate of return used to discount future cash flows back to their present value.** This rate is often a company's Weighted Average Cost of Capital (WACC), required rate of return, or the hurdle rate that investors expect to earn relative to the risk of the investment.
- Finance Rate: 8% (assumed not financing - not used)
 - Definition: interest rate on a loan
- Reinvestment Rate: 10%
 - Definition: **the return an investor expects to receive after reinvesting the cash flows from an investment.**
- Utility Inflation Rate: 5%
 - Definition: increase in utility bills
- Non-Utility Inflation Rate: 5%
 - Definition: **the rate of increase in prices over a given period of time.**
- Cost of Energy:
 - Electricity: \$0.16 / kWh
 - Gas: \$0.87 / Therm



For more information on Geothermal Loop Tax Incentives visit vyron.com/geo

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