NIST BLCC 5.3-20: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology and Procedures, 10 CFR, Part 436, Subpart A

Base Case: Existing System

Alternative: New System

General Information

File Name:	C:\Users\jkneifel\BLCC5.3-2020\projects\FEMPEnergy.xml
Date of Study:	Tue Sep 01 08:51:39 EDT 2020
Project Name:	Heating/Cooling System
Project Location:	District of Columbia
Analysis Type:	FEMP Analysis, Energy Project
Analyst:	Courtney Mayer
Comment	Replacement of Baseboard/ AC System with Heat Pump in Park Service House
Base Date:	April 1, 2020
Service Date:	April 1, 2020
Study Period:	15 years 0 months(April 1, 2020 through March 31, 2035)
Discount Rate:	3%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$1,500	$3,000	-$1,500
Future Costs:			
Energy Consumption Costs	$14,135	$9,659	$4,476
Energy Demand Charges	$0	$0	$0
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$746	$1,668	-$922
Capital Replacements	$446	$0	$446
Residual Value at End of Study Period	-$289	-$481	$193
Subtotal (for Future Cost Items)	$15,039	$10,845	$4,193
Total PV Life-Cycle Cost	$16,539	$13,845	$2,693

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings	$3,554
- Increased Total Investment	$861

Net Savings	$2,693

Savings-to-Investment Ratio (SIR)

SIR = 4.13

Adjusted Internal Rate of Return

AIRR = 13.21%

Payback Period

Estimated Years to Payback (from beginning of Service Period)

Simple Payback occurs in year	5
Discounted Payback occurs in year	6

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy Type	Average Annual Consumption – Base Case	Alternative	Savings	Life-Cycle Savings
Electricity	15,000.0 kWh	10,250.0 kWh	4,750.0 kWh	71,227.2 kWh

Energy Savings Summary (in MBtu)

Energy Type	Average Annual Consumption – Base Case	Alternative	Savings	Life-Cycle Savings
Electricity	51.2 MBtu	35.0 MBtu	16.2 MBtu	243.0 MBtu

Emissions Reduction Summary

Energy Type	Average Annual Emissions – Base Case	Alternative	Reduction	Life-Cycle Reduction
Electricity				
CO2	17,762.33 kg	12,137.59 kg	5,624.74 kg	84,344.13 kg
SO2	58.88 kg	40.23 kg	18.64 kg	279.59 kg
NOx	26.58 kg	18.16 kg	8.42 kg	126.20 kg
Total:				
CO2	17,762.33 kg	12,137.59 kg	5,624.74 kg	84,344.13 kg
SO2	58.88 kg	40.23 kg	18.64 kg	279.59 kg
NOx	26.58 kg	18.16 kg	8.42 kg	126.20 kg