NIST BLCC 5.3-20: Detailed LCC Analysis

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

General Information

File Name:	C:\Users\jkneifel\BLCC5.3-2020\projects\FEMPEnergy.xml
Date of Study:	Tue Sep 01 08:32:33 EDT 2020
Analysis Type:	FEMP Analysis, Energy Project
Project Name:	Heating/Cooling System
Project Location:	District of Columbia
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

Discount and Escalation Rates are REAL (exclusive of general inflation)

Alternative: Existing System

Initial Cost Data (not Discounted)

Initial Capital Costs

(adjusted for price escalation)

Initial Capital Costs for All Components: $1,500

Component: Baseboard Heater
Cost-Phasing

Date	Portion	Yearly Cost
April 1, 2020	100%	$500
Total (for Component)		$500

Component: Window AC Unit
Cost-Phasing

Date	Portion	Yearly Cost
April 1, 2020	100%	$1,000
Total (for Component)		$1,000

Energy Costs: Electricity

(base-year dollars)

Average Annual Usage	Average Price/Unit	Average Annual Cost	Average Annual Demand	Average Annual Rebate
15,000.0 kWh	$0.08000	$1,200	$0	$0

Life-Cycle Cost Analysis

	Present Value	Annual Value
Initial Capital Costs	$1,500	$126
Energy Costs		
Energy Consumption Costs	$14,135	$1,184
Energy Demand Charges	$0	$0
Energy Utility Rebates	$0	$0
Subtotal (for Energy):	$14,135	$1,184
Water Usage Costs	$0	$0
Water Disposal Costs	$0	$0
Operating, Maintenance & Repair Costs		
Component: Baseboard Heater		
Annually Recurring Costs	$0	$0
Non-Annually Recurring Costs	$0	$0
Component: Window AC Unit		
Annually Recurring Costs	$597	$50
Non-Annually Recurring Costs	$149	$12
Subtotal (for OM&R):	$746	$62
Replacements to Capital Components		
Component: Baseboard Heater	$0	$0
Component: Window AC Unit	$446	$37
Subtotal (for Replacements):	$446	$37
Residual Value of Original Capital Components		
Component: Baseboard Heater	-$32	-$3
Component: Window AC Unit	-$64	-$5
Subtotal (for Residual Value):	-$96	-$8
Residual Value of Capital Replacements		
Component: Baseboard Heater	$0	$0

Component: Window AC Unit	-$193	-$16
Subtotal (for Residual Value):	-$193	-$16
Total Life-Cycle Cost	$16,539	$1,386

Emissions Summary

Energy Name	Annual	Life-Cycle
Electricity:		
CO2	17,762.33 kg	266,349.87 kg
SO2	58.88 kg	882.90 kg
NOx	26.58 kg	398.52 kg
Total:		
CO2	17,762.33 kg	266,349.87 kg
SO2	58.88 kg	882.90 kg
NOx	26.58 kg	398.52 kg

Alternative: New System

Initial Cost Data (not Discounted)

Initial Capital Costs

(adjusted for price escalation)

Initial Capital Costs for All Components: $3,000

Component: Heat Pump
Cost-Phasing

Date	Portion	Yearly Cost
April 1, 2020	100%	$3,000
Total (for Component)		$3,000

Energy Costs: Electricity

(base-year dollars)

Average Annual Usage	Average Price/Unit	Average Annual Cost	Average Annual Demand	Average Annual Rebate
10,250.0 kWh	$0.08000	$820	$0	$0

Life-Cycle Cost Analysis

	Present Value	Annual Value
Initial Capital Costs	$3,000	$251
Energy Costs		

Energy Consumption Costs	$9,659	$809
Energy Demand Charges	$0	$0
Energy Utility Rebates	$0	$0
Subtotal (for Energy):	$9,659	$809
Water Usage Costs	$0	$0
Water Disposal Costs	$0	$0
Operating, Maintenance & Repair Costs		
Component: Heat Pump		
Annually Recurring Costs	$1,194	$100
Non-Annually Recurring Costs	$474	$40
Subtotal (for OM&R):	$1,668	$140
Replacements to Capital Components		
Component: Heat Pump	$0	$0
Subtotal (for Replacements):	$0	$0
Residual Value of Original Capital Components		
Component: Heat Pump	-$481	-$40
Subtotal (for Residual Value):	-$481	-$40
Residual Value of Capital Replacements		
Component: Heat Pump	$0	$0
Subtotal (for Residual Value):	$0	$0
Total Life-Cycle Cost	$13,845	$1,160

Emissions Summary

Energy Name	Annual	Life-Cycle
Electricity:		
CO2	12,137.59 kg	182,005.74 kg
SO2	40.23 kg	603.32 kg
NOx	18.16 kg	272.32 kg
Total:		

Total:

CO2	12,137.59 kg	182,005.74 kg
SO2	40.23 kg	603.32 kg
NOx	18.16 kg	272.32 kg