

2021 IECC R-406 Projected Energy Rating Index Report

Property

Builder:Boxabl

Address:

200 W Washington St, Phoenix, AZ 85003

Organization

Company:Home Energy Connection, LLC

Phone:702-451-8630

Rater:Les Lazareck

Energy Rating Index Information

Projected Rating

Rating No:

Rater ID (RTIN):8274479

Date Rated:2022-12-10

Estimated Annual Energy Consumption*

	Rated Home Calculated Energy Use (MBtu)	Rated Home Cost (\$/yr)
Heating	0.3	\$11
Cooling	3.3	\$109
Water Heating	3.1	\$102
Lights & Appliances	8.6	\$285
Photovoltaics	0.0	\$0
Total	15.3	\$507

*Based on standard operating conditions

ERI with PV:41

ERI without PV:41

Annual Estimates

Electric (kWh):4,489.7

Natural Gas (Therms):0.0

CO2 Emissions (Tons):2.4

Maximum Energy Rating Index:52

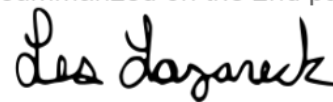
This Home's Energy Rating Index:41

PASS

This home MEETS the Energy Rating Index Score requirement of 2021 IECC R-406 for Climate Zone 2. It MEETS all of the requirements verified by Ekotrope. Mandatory requirements are summarized on the 2nd page of this report, some of which are not verified by Ekotrope.

Name: Les Lazareck

Signature:



Organization: Home Energy Connection, LLC

Digitally signed: 12/10/22 at 1:54 PM

Rating Provider Data and Seal

Company:Building Efficiency Resources

Address:PO Box 1769 Brevard, NC 28712

Phone #:800-399-9620

Fax #:877-399-1361



To determine if a provider is properly accredited go to: www.resnet.us/professional/programs/search_directory

(Projected. Confirmation required.)

Climate Zone 2 Mandatory Requirements		
Provision Number	Topic	Compliance Decision
R406.5	IECC 2021 ERI: 41 Max allowed: 95% of 52 (49.40)	Pass
R402.4.1.2	Air Leakage Testing	Pass
R403.3.1	Duct Insulation	Pass
R404.1	Lighting Equipment	Pass
Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.	Pass
R403.6.2	Mechanical Ventilation Efficacy	Pass
R403.6.1	Mechanical Ventilation Energy Recovery	Pass
R406.2	All other requirements from Table R406.2 not explicitly checked by Ekotrope.	PASS*

* This is a projected rating. These items must eventually be field-verified by the Rater, Field Inspector, Code Inspector, or Builder.

Ekotrope RATER - Version 4.0.2.3049

IECC 2021 ERI compliance results calculated using Ekotrope RATER's energy and code compliance algorithm.
Ekotrope RATER is a RESNET Accredited HERS Rating Tool. All results are based on data entered by Ekotrope users.
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2018 IECC R-406 Projected Energy Rating Index Report

Property

Builder:Boxabl

Address:

200 W Washington St, Phoenix, AZ 85003

Organization

Company:Home Energy Connection, LLC

Phone:702-451-8630

Rater:Les Lazareck

Energy Rating Index Information

Projected Rating

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Rater ID (RTIN):8274479

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Cooling	3.3	\$109
Water Heating	3.1	\$102
Lights & Appliances	8.6	\$285
Photovoltaics	0.0	\$0
Total	15.3	\$507

*Based on standard operating conditions

ERI with PV:51

ERI without PV:51

Annual Estimates

Electric (kWh):4,489.7

Natural Gas (Therms):0.0

CO2 Emissions (Tons):2.4

Maximum Energy Rating Index:57

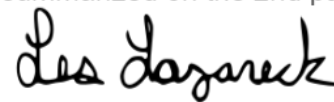
This Home's Energy Rating Index:51

PASS

This home MEETS the Energy Rating Index Score requirement of 2018 IECC R-406 for Climate Zone 2. It MEETS all of the requirements verified by Ekotrope. Mandatory requirements are summarized on the 2nd page of this report, some of which are not verified by Ekotrope.

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Signature:



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(Projected. Confirmation required.)

Climate Zone 2 Mandatory Requirements		
Provision Number	Topic	Compliance Decision
2009 IECC Table 402.1.1 or 402.1.3	Building thermal envelope minimum insulation levels and maximum fenestration U-factor and SHGC	PASS
R401.3	Post a permanent certificate listing the level of efficiencies installed in the house	Certificate required for CO
R402.4.1.2	Envelope air leakage maximum leakage rate	PASS
R402.4.1 / Table R402.4.1.1	Comply with air sealing and insulation requirements in Table R402.4.1.1	Checklist required for CO
R402.4.4	Rooms containing fuel-burning appliances	PASS*
R402.5	Maximum fenestration U-factor and SHGC	(U-Factor) PASS
		(SHGC) PASS
R403.1.2	Heat pump controls	PASS*
R406.2	Ducts outside of conditioned space to be insulated to a minimum of R-6.	PASS*
R403.3.2	Duct sealing on all ducts	PASS*
R403.3.3	Duct testing for ducts in unconditioned space	PASS*
R403.3.5	Building cavities not used as ducts.	PASS*
R403.5.1	Heated water circulation and temperature maintenance systems comply	PASS*
R403.5.3	Hot water pipe insulated to R-3	PASS
R403.6	Mechanical ventilation meeting the requirements of the IRC or IMC. Outdoor air and exhaust dampers installed	PASS*
R403.7	ACCA Manual J and S conducted for all heating and cooling systems.	ACCA forms required for permit
R403.8	Systems serving multiple dwelling units to meet the mechanical requirements of IECC commercial code	PASS*
R403.9	Snow melt and ice system controls installed where applicable	PASS*
R403.10	Pools and permanent spa energy consumption meet requirements for heaters, time clocks and covers	PASS*
R403.11	Portable spas meet the requirements of APSP-14.	PASS*
R404.1	High efficacy lights installed in 90% of permanently installed fixtures.	PASS

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IECC 2021 Performance Compliance

Property

200 W Washington St
Phoenix, AZ 85003
Model: Ceiling: 9'-4" (9.3')

Organization

Home Energy Connection,
Les Lazareck
702-451-8630

Inspection Status

Results are projected



Boxabl_Gen2-2022-1210 AZ
Boxabl_Gen2-2022-1210 Phoenix

Builder

Boxabl

This report is based on a proposed design and does not confirm field enforcement of design elements.

Annual Energy Cost

Design	IECC 2021 Performance	As Designed
Heating	\$34	\$14
Cooling	\$144	\$117
Water Heating	\$139	\$139
Mechanical Ventilation	\$12	\$4
SubTotal - Used to determine compliance	\$330	\$275
Lights & Appliances w/out Ventilation	\$263	\$263
Onsite generation	\$0	\$0
Total	\$592	\$537

R405.3 Source Energy Exception: The proposed home uses 5.62 MBtu LESS source energy than the reference home.

Requirements

✓	R405.2	Performance-based compliance passes by 16.7%	The proposed house meets the IECC 2021 Performance reference energy bill requirement by \$54.98 (5.62 MBtu).
✓	R405.2 Item 2	Total UA alternative compliance passes by 52.1%	The proposed home meets the UA requirement by 52.1%
✓	R405.2 Item 2	Average SHGC: 0.19 Max SHGC: 0.30	Average SHGC of 0.19 is greater than the maximum of 0.30.
✓	R402.4.1.2	Air Leakage Testing	Air sealing is 2.50 ACH at 50 Pa. It must not exceed 7.66 ACH at 50 Pa.
✓	R403.3.1	Duct Insulation	All ducts outside the thermal envelope must be insulated to at least R6.0.
✓	R404.1	Lighting Equipment	At least 100.0% of fixtures shall be high-efficacy lamps, currently 100.0% are high-efficacy.
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.	2021 IECC Required Items must be checked as complete.
✓	R403.6.2	Mechanical Ventilation Efficacy	
✓	R403.6.1	Mechanical Ventilation Energy Recovery	
✓	R402.5	Area-weighted average fenestration SHGC	Area-weighted average fenestration SHGC is 0.193. The maximum allowed value is 0.4.
✓	R402.5	Area-weighted average fenestration U-Factor	
✓	R401.2.5 Option 2	Additional energy efficiency	R401.2.5: 2.2 - 95% Threshold Met.

Design exceeds requirements for IECC 2021 Performance compliance by 16.7%.

As a 3rd party extension of the code jurisdiction utilizing these reports, I certify that this energy code compliance document has been created in accordance with the requirements of Chapter 4 of the adopted International Energy Conservation Code based on MARICOPA County. If rating is Projected, I certify that the building design described herein is consistent with the building plans, specifications, and other calculations submitted with the permit application. If rating is Confirmed, I certify that the address referenced above has been inspected/tested and that the mandatory provisions of the IECC have been installed to meet or exceed the intent of the IECC or will be verified as such by another party.

Name: Les Lazareck

Signature:

Organization: Home Energy Connection, LLC

Digitally signed:

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IECC 2018 Performance Compliance

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Boxabl_Gen2-2022-1210 AZ

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Builder

Boxabl

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Annual Energy Cost

Design	IECC 2018 Performance	As Designed
Heating	\$35	\$14
Cooling	\$145	\$117
Water Heating	\$159	\$159
Mechanical Ventilation	\$12	\$4
SubTotal - Used to determine compliance	\$351	\$295
Lights & Appliances w/out Ventilation	\$263	\$263
Onsite generation	\$0	\$0
Total	\$614	\$557

R405.3 Source Energy Exception: The proposed home uses 5.78 MBtu LESS source energy than the reference home.

Requirements

✓	R405.3	Performance-based compliance passes by 16.1%	The proposed house meets the IECC 2018 Performance reference energy bill requirement by \$56.58 (5.78 MBtu).
✓	R402.4.1.2	Air Leakage Testing	Air sealing is 2.50 ACH at 50 Pa. It must not exceed 5.00 ACH at 50 Pa.
✓	R402.5	Area-weighted average fenestration SHGC	Area-weighted average fenestration SHGC is 0.193. The maximum allowed value is 0.5.
✓	R402.5	Area-weighted average fenestration U-Factor	
✓	R404.1	Lighting Equipment	At least 90.0% of fixtures shall be high-efficacy lamps, currently 100.0% are high-efficacy.
✓	R403.6.1	Mechanical Ventilation Efficacy	
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.	2018 IECC Mandatory Checklist must be checked as complete.
✓	IRC M1505.4.3	Mechanical Ventilation Rate	
✓	R405.2	Duct Insulation	All ducts outside the thermal envelope must be insulated to at least R6.0.

Design exceeds requirements for IECC 2018 Performance compliance by 16.1%.

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Ekotrope RATER - Version 4.0.2.3049

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IECC 2021 Building UA Compliance

**Property**

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Results are projected

Boxabl_Gen2-2022-1210 AZ

Boxabl_Gen2-2022-1210 Phoenix

Builder

Boxabl

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Building UA

Elements	IECC Reference	As Designed
Ceilings	9.4	16.8
Above-Grade Walls	51.3	28.4
Windows, Doors and Skylights	38.4	16.0
Slab Floor:	0.0	0.0
Framed Floors	23.1	9.8
Foundation Walls	0.0	0.0
Rim Joists	0.0	0.0
Overall UA (Design must be equal or lower):	122.2	71.0

Requirements

✓	R402.1.5	Total UA alternative compliance passes by 41.9%. The proposed home meets the UA requirement by 41.9%
✓	402.3.2	Average SHGC: 0.19 Max SHGC: 0.25 Average SHGC of 0.19 is greater than the maximum of 0.25.
✓	R402.4.1.2	Air Leakage Testing Air sealing is 2.50 ACH at 50 Pa. It must not exceed 7.66 ACH at 50 Pa.
✓	R403.3.1	Duct Insulation All ducts outside the thermal envelope must be insulated to at least R6.0.
✓	R404.1	Lighting Equipment At least 100.0% of fixtures shall be high-efficacy lamps, currently 100.0% are high-efficacy.
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met. 2021 IECC Required Items must be checked as complete.
✓	R403.6.2	Mechanical Ventilation Efficacy
✓	R403.6.1	Mechanical Ventilation Energy Recovery
✓	R403.3.6	Duct Leakage Testing
✓	R403.5.2	Hot water pipe insulation Hot water pipes at least 3/4 in diameter must be insulated to R-3 at minimum.
✓	R402.5	Area-weighted average fenestration SHGC Area-weighted average fenestration SHGC is 0.193. The maximum allowed value is 0.4.
✓	R402.5	Area-weighted average fenestration U-Factor
✓	R402.4.1.3	Prescriptive Air Leakage Air sealing is 2.50 ACH at 50 Pa. It must not exceed 5.00 ACH at 50 Pa.
✓	IRC M1505.4.3	Mechanical Ventilation Rate
✓	R408.2	Additional efficiency package options ✓ R408.2.1 - Enhanced envelope performance ✓ R408.2.4 - More efficient duct thermal distribution system

Design exceeds requirements for IECC 2021 Prescriptive compliance by 41.9%.

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Signature:

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IECC 2018 Building UA Compliance

Property

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Phoenix, AZ 85003
Model: Ceiling: 9'-4" (9.3')

Organization

Home Energy Connection,
Les Lazareck
702-451-8630

Inspection Status

Results are projected



Boxabl_Gen2-2022-1210 AZ
Boxabl_Gen2-2022-1210 Phoenix

Builder

Boxabl

This report is based on a proposed design and does not confirm field enforcement of design elements.

Building UA

Elements	IECC Reference	As Designed
Ceilings	10.8	16.8
Above-Grade Walls	51.3	28.4
Windows, Doors and Skylights	38.4	16.0
Slab Floor:	0.0	0.0
Framed Floors	23.1	9.8
Foundation Walls	0.0	0.0
Rim Joists	0.0	0.0
Overall UA (Design must be equal or lower):	123.6	71.0

Requirements

✓	R402.1.5	Total UA alternative compliance passes by 42.6%. The proposed home meets the UA requirement by 42.6%
✓	402.3.2	Average SHGC: 0.19 Max SHGC: 0.25 Average SHGC of 0.19 is greater than the maximum of 0.25.
✓	R402.4.1.2	Air Leakage Testing Air sealing is 2.50 ACH at 50 Pa. It must not exceed 5.00 ACH at 50 Pa.
✓	R402.5	Area-weighted average fenestration SHGC Area-weighted average fenestration SHGC is 0.193. The maximum allowed value is 0.5.
✓	R402.5	Area-weighted average fenestration U-Factor
✓	R404.1	Lighting Equipment At least 90.0% of fixtures shall be high-efficacy lamps, currently 100.0% are high-efficacy.
✓	R403.6.1	Mechanical Ventilation Efficacy
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met. 2018 IECC Mandatory Checklist must be checked as complete.
✓	IRC M1505.4.3	Mechanical Ventilation Rate
✓	R403.3.4	Duct Leakage Testing
✓	R403.5.3	Hot water pipe insulation Hot water pipes at least 3/4 in diameter must be insulated to R-3 at minimum.

Design exceeds requirements for IECC 2018 Prescriptive compliance by 42.6%.

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Signature:

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12/10/22 at 1:54 PM

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Air Leakage Report

Property

200 W Washington St
Phoenix, AZ 85003
Model: Ceiling: 9'-4" (9.3')

Organization

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Les Lazarek
702-451-8630

Inspection Status

Results are projected



Boxabl_Gen2-2022-1210 AZ

Boxabl_Gen2-2022-1210 Phoenix

Builder

Boxabl

General Information

Conditioned Floor Area [ft ²]	361
Infiltration Volume [ft ³]	3,357
Number of Bedrooms	1

Air Leakage

Measured Infiltration	2.5 ACH50
ACH50 (Calculated)	2.50
ELA [sq. in.] (Calculated)	7.67
ELA per 100 s.f. Shell Area (Calculated)	0.537
CFM50 (Calculated)	140
CFM50 / s.f. Shell Area (Calculated)	0.098

Duct Leakage

Leakage to Outdoors
Total Leakage Test Type
Total Leakage [CFM @ 25 Pa]
Total Leakage [CFM25 / 100 s.f.]
Total Leakage [CFM25 / CFA]

Mechanical Ventilation

Rate [CFM]	70 CFM
Hours per day	7.3
Fan Power	13.2 Watts
Recovery Efficiency %	0.0
Runs at least once every 3 hrs?	true
Average Rate [CFM]	21.3 CFM
2010 ASHRAE 62.2 Req. Cont. Ventilation	18.6
2013 ASHRAE 62.2 Req. Cont. Ventilation	22.5

Emissions Summary

Property

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Boxabl_Gen2-2022-1210 AZ
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Builder

Boxabl

Emissions by End-Use

Carbon Dioxide (CO₂) [tons/yr]

Heating	0.1
Cooling	0.5
Water Heating	0.5
Lights & Appliances	1.3
Photovoltaics	-0.0
TOTAL	2.4

Sulfur Dioxide (SO₂) [lbs/yr]

Heating	0.2
Cooling	1.5
Water Heating	1.4
Lights & Appliances	4.0
Photovoltaics	-0.0
TOTAL	7.2

Nitrogen Oxide (NO_x) [lbs/yr]

Heating	0.1
Cooling	0.9
Water Heating	0.8
Lights & Appliances	2.3
Photovoltaics	-0.0
TOTAL	4.0

Energy Use Intensity (EUI) [kBtu/ft²]

Site EUI	42.4
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Fuel Summary

Property

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Organization

Home Energy Connection, LL
Les Lazareck
702-451-8630

Inspection Status

Results are projected



Boxabl_Gen2-2022-1210 AZ

Boxabl_Gen2-2022-1210 Phoenix

Builder

Boxabl

Annual Energy Cost

Electric	\$507
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Annual End-Use Cost

Heating	\$11
Cooling	\$109
Water Heating	\$102
Lights & Appliances	\$285
Onsite Generation	-\$0
Service Charges	\$0
Total	\$507

Annual End-Use Consumption

Heating [Electric kWh]	95.6
Cooling [Electric kWh]	964.2
Hot Water [Electric kWh]	904.9
Lights & Appliances [Electric kWh]	2,525.0
Total [Electric kWh]	4,489.7
Total Onsite Generation [Electric kWh]	0.0

Peak Electric Consumption

Peak Winter kW	0.61
Peak Summer kW	0.85

Utility Rates

Electricity	APS-Fixed
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Building Specification Summary

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Builder

Boxabl

Building Information

Conditioned Area [ft²]	361.00
Conditioned Volume [ft³]	3,357.00
Thermal Boundary Area [ft²]	1,428.80
Number Of Bedrooms	1
Housing Type	Single family detached

Rating

HERS Index	40
HERS Index w/o PV	40

Building Shell

Ceiling w/ Attic	
R-21.5 [MGO .25"+EPS 5.3125"]; U-0.046	
Vaulted Ceiling None	
Above Grade Walls	
R-22 Wall (5.312 EPS/.25 MGO); U-0.046	
Found. Walls None	
Framed Floors R-36.9 9" EPS path; R-36	
Slabs None	

Windows (largest) U-Value: 0.18, SHGC: 0.19	
Window / Wall Ratio 0.10	
Infiltration 2.5 ACH50	
Duct Lkg to Outside Forced Air Ductless	
Total Duct Leakage Untested	

Mechanical Systems

Heating	Air Source Heat Pump • Electric • 8.5 HSPF
Cooling	Air Source Heat Pump • Electric • 18 SEER2
Water Heating	Residential Water Heater • Electric • 0.93 Energy Factor
Programmable Thermostat	Yes
Ventilation System	70 CFM • 13.2 Watts
Whole House Fan	N/A

Lights and Appliances

Percent Interior LED	100%	Clothes Dryer Fuel	Electric
Percent Exterior LED	100%	Clothes Dryer CEF	2.1
Refrigerator (kWh/yr)	674.0	Clothes Washer LER (kWh/yr)	120.0
Dishwasher Efficiency	270 kWh	Clothes Washer Capacity	2.3
Ceiling Fan	None	Range/Oven Fuel	Electric

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Boxabl_Gen2-2022-1210 AZ
Boxabl_Gen2-2022-1210 Phoenix

Builder
Boxabl

Home Energy Connection
Building Performance Experts



General Building Information

Number Of Bedrooms	1
Number Of Floors	1
Conditioned Floor Area [sq. ft.]	361
Has Electric Vehicle Ready Space	No
Unconditioned, attached garage?	No
Conditioned Volume [cu. ft.]	3,357
Total Units in Building	1
Residence Type	Single family detached
Number of Floors in Building	-
Floor Number	-
Model	Ceiling: 9'-4" (9.3')
Community	
RESNET/IECC 2006-2018 Climate Zone	2B
IECC 2021 Climate Zone	2B

Foundation Wall

None Present

Foundation Wall Library List

None Present

Slab

None Present

Slab Library List

None Present

Framed Floor

Name	Library Type	Carpet R	Floor Grade	Surface Area	Location
Floor 9" EPS	R-36.9 9" EPS path	0	Above Grade	361.0 ft²	Unvented Crawl

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Builder

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Framed Floor Library List

Name	Effective R-value
------	-------------------

R-36.9 9" EPS path	36.90
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Rim Joist

None Present

Rim Joist Library List

None Present

Wall

Name	Library Type	Surface Color	Surface Area	Location
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Wall 5.3125" EPS amb	R-22 Wall (5.312 EPS/.25 MGO)	Light	706.8 ft²	Exposed Exterior
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Wall Library List

Name	Effective R-value
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R-22 Wall (5.312 EPS/.25 MGO)	21.528
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Glazing

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Is Operable	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
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F1 3060 SH	Triple/LoE/18/19/vt	Wall 5.3125" EPS amb		Yes	0	0	0	South	18.0 ft²
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L2-3 (2) Sitting/Bed 3060 SH	Triple/LoE/18/19/vt	Wall 5.3125" EPS amb		Yes	0	0	0	West	36.0 ft²
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R5 Bath 3020 FX	Triple/LoE/16/20/vt	Wall 5.3125" EPS amb		Yes	0	0	0	East	6.0 ft²
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R6 Kit 3040 FX	Triple/LoE/16/20/vt	Wall 5.3125" EPS amb		Yes	0	0	0	East	12.0 ft²
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Building Summary

Property

200 W Washington St
Phoenix, AZ 85003
Model: Ceiling: 9'-4" (9.3')

Organization

Home Energy Connection, LLC
Les Lazareck
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Inspection Status

Results are projected



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Glazing Library List

Name	Shgc	U-factor
Triple/LoE/16/20/38 vt	0.2	0.160
Triple/LoE/18/19/36 vt	0.19	0.180

Skylight

None Present

Skylight Library List

None Present

Opaque Door

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Emittance	Solar Absorptance	Surface Color	Surface Area	Location
Door R7.14	Fiberglass R-7.14	Wall 5.3125" EPS amb		0.9	0.6	Light	24.0 ft²	Exposed Exterior

Opaque Door Library List

Name	Effective R-value
Fiberglass R-7.14	7.14

Roof Insulation

Name	Library Type	Attic Exterior Area [ft²]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
R-21_5.3125" EPS	R-21.5 [MGO .25"+EPS 5.3125"]	364	No	Light	361.0 ft²	Attic

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Roof Insulation Library List

Name	Has Radiant Barrier	Effective R-value
R-21.5 [MGO .25"+EPS 5.3125"]	No	21.528

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
2.5 ACH at 50 Pa	Blower-door tested	4

Mechanical Ventilation

Ventilation Type	Ventilation Rate [ft ³ / Minute]	Operational hours per day	Fan Watts	Runs once every three hours	Energy Recovery Percent	Model Number	Manufacturer
Exhaust Only	70 CFM	7.3	13.2 Watts	Yes	0	SLM70	Delta

Lighting

% Interior Fluorescent Lighting	% Interior LED Lighting	% Exterior Fluorescent Lighting	% Exterior LED Lighting	% Garage Fluorescent Lighting	% Garage LED Lighting
0	100	0	100	0	100

Onsite Generation

None Present

Onsite Generation Library List

None Present

Solar Generation

None Present

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Dehumidifier

None Present

Dehumidifier Library List

None Present

Whole House Fan

None Present

Whole House Fan Library List

None Present

Conditioning Equipment

Name	Library Type	Serial Number	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Air-source heat pump	9k 18seer, 10.9 8.5hspf		100%	100%	0%	Conditioned Space
Water Heating (Storage)	40 gal-Elec 0.93EF		0%	0%	100%	Conditioned Space

Equipment Type: 40 gal-Elec 0.93EF

Equipment Type	Residential Water Heater
Fuel Type	Electric
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	0.93 Energy Factor
Tank Capacity (gal.)	40
Hot Water Capacity [kBtu/h]	4.5
Recovery Efficiency	0.98

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Equipment Type: 9k 18seer, 10.9 8.5hspf

Equipment Type	Air Source Heat Pump
Fuel Type	Electric
Distribution Type	Forced Air Ductless
Motor Type	ECM (Variable Speed)
Heat Pump System Type	Split System
Heating Efficiency	8.5 HSPF
Heating Capacity [kBtu/h]	10.9
Cooling Efficiency	18 SEER2
Cooling Capacity [kBtu/h]	9

Distribution System

Distribution Type	Forced Air Ductless
Heating Equipment	Air-source heat pump
Cooling Equipment	Air-source heat pump
Is All Equipment In Conditioned Space	Yes
Leakage Default	HERS Default Leakage
Duct System Efficiency	1

HVAC Grading

HVAC Grading Not Conducted

Ceiling Fan

Has Ceiling Fan	No
Cfm Per Watt	100

Water Distribution

Water Fixture Type	Low-flow
Use Default Hot Water Pipe Length	No
Hot Water Pipe Length [ft]	24
At Least R3 Pipe Insulation?	Yes
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	110
Drain Water Heat Recovery?	No

Clothes Dryer

Cef	2.09
Fuel Type	Electric
Field Utilization	Moisture Sensing
Is Outside Conditioned Space	No
Clothes Dryer Available	Yes
Defaults Type	Custom

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Clothes Washer

Label Energy Rating	120 kWh/Year
Annual Gas Cost	\$11.00
Electric Rate	\$0.12/kWh
Gas Rate	\$1.09/Therm
Capacity	2.3
Imef	2.92
Defaults Type	Custom
Load Type	Front-load
Loads Per Week	6
Is Outside Conditioned Space	No
Clothes Washer Available	Yes

Dishwasher

Dishwasher Efficiency	270 kWh
Dishwasher Size	Compact
Annual Gas Cost	\$24.00
Electric Rate	\$0.13/kWh
Gas Rate	\$1.05/Therm
Is Outside Conditioned Space	No

Appliances and Controls

Programmable thermostat?	Yes
Range/Oven Fuel	Electric
Convection Oven?	Yes
Induction Range?	No
Range/Oven Outside Conditioned Space?	No
Refrigerator Consumption	674 kWh/Year
Refrigerator Outside Conditioned Space?	No

Notes

Minisplit: LG LS090HFV3 17 SEER, Cool 9,000 BTU, Heat 10,900 BTU, 9.0 HSPF
LG W/D Combo Tower WKE100HWA (\$1800)

Dishwasher: LG LDFN3432T 258

Refrigerator LG LRMNC1813 430 kWh/yr
Range LG LSE4616ST (\$3000) Convection/Induction

graphite eps
best energy windows
lowest level of air circulation we can reasonably achieve on the next generation of our product
Yes on the tankless if its better
The most energy efficient appliances

End Use Energy Costs

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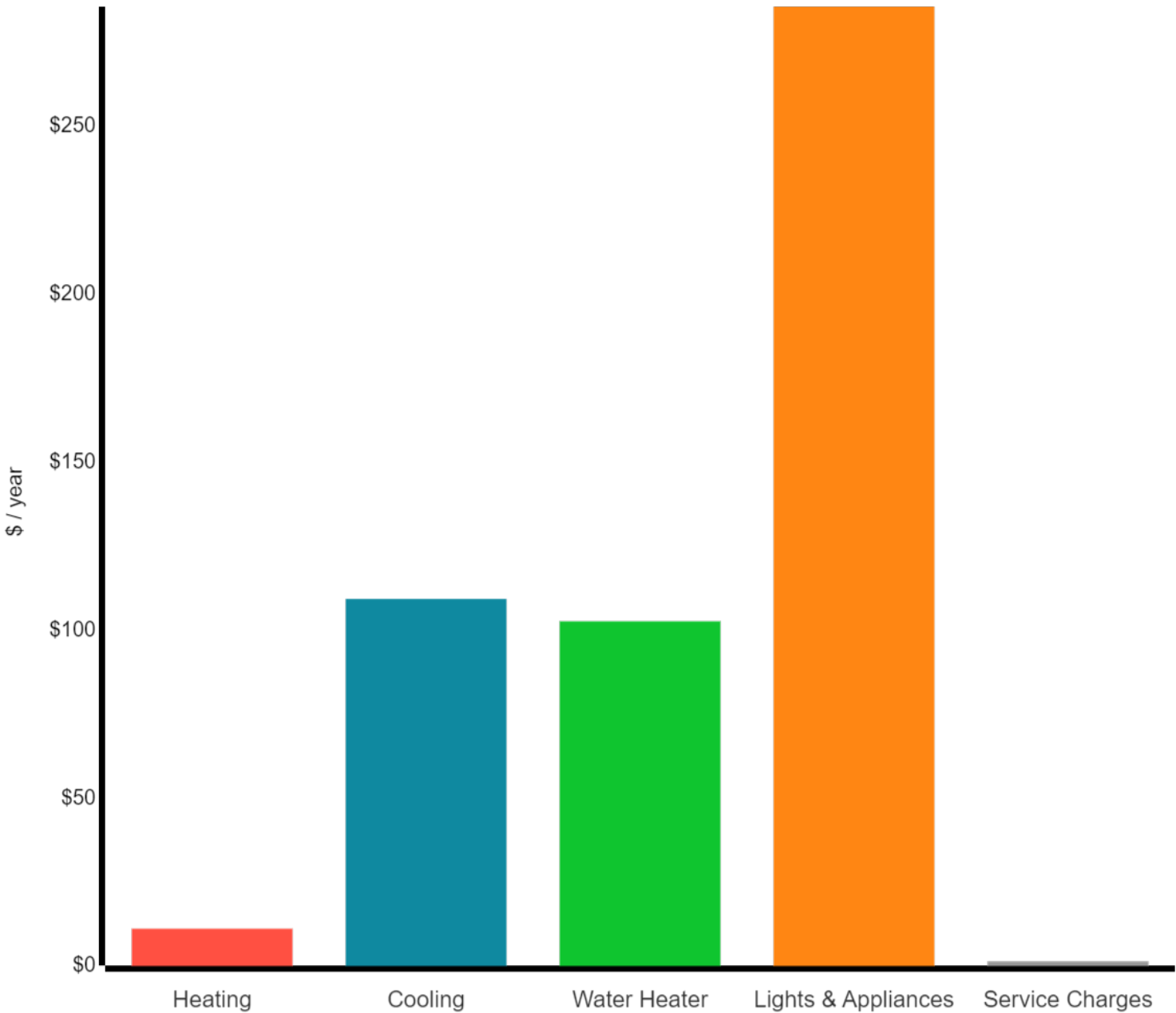
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Annual Energy Cost



Component Loads

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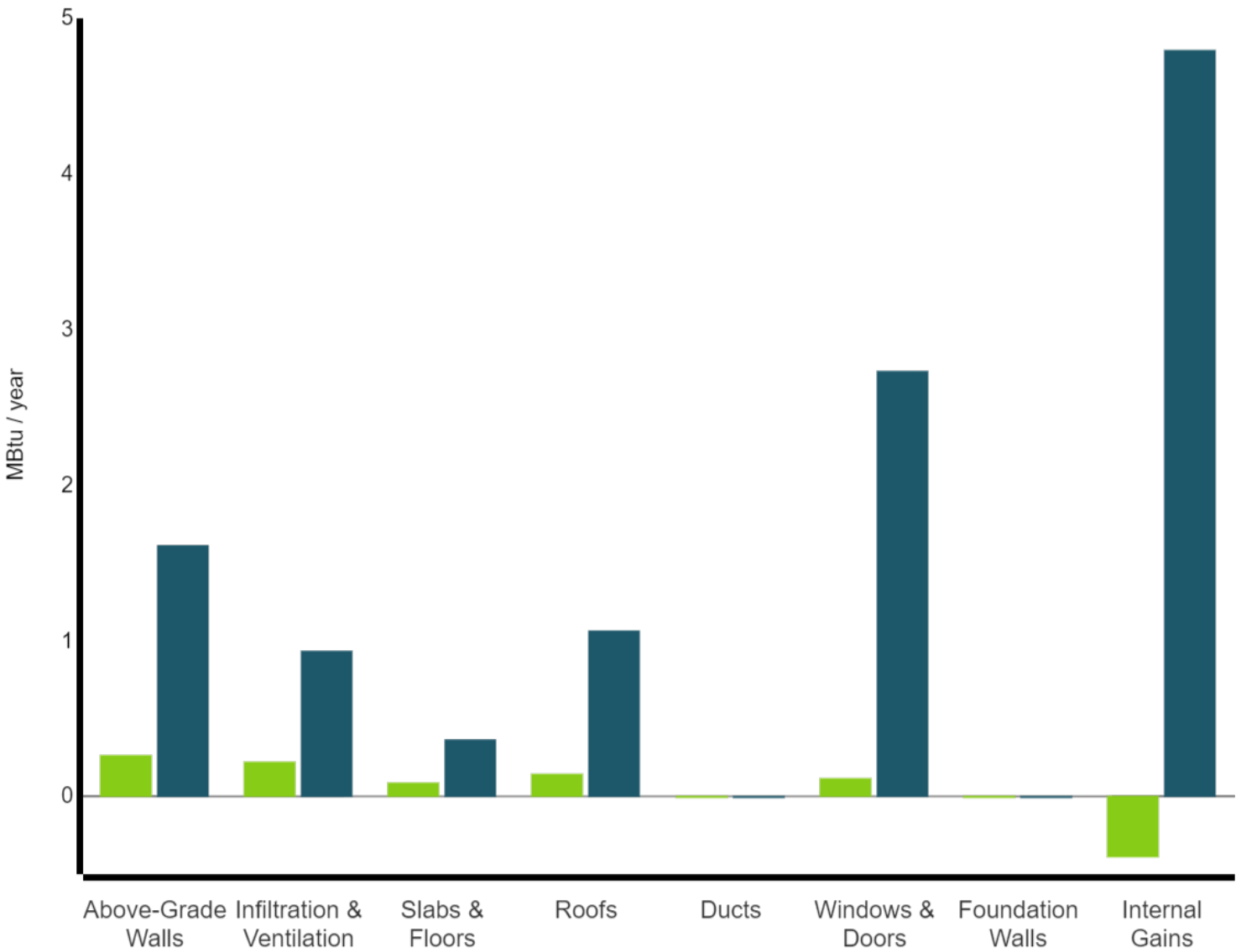
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Heating & Cooling Loads



Heating 
Cooling 

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Component Costs

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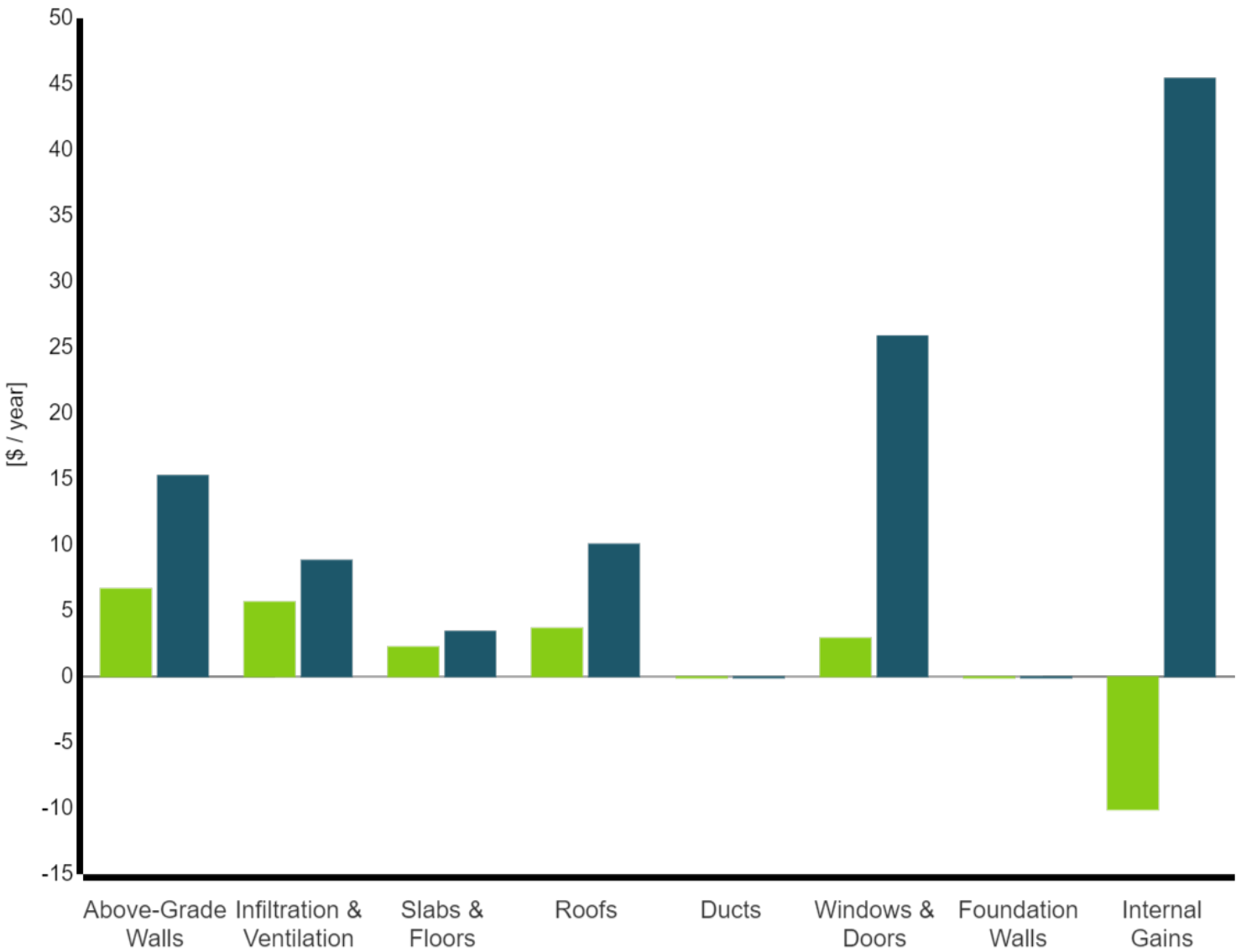
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Heating & Cooling Costs



Heating 
Cooling 

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