

RENOVATE AMERICA GREEN BOND PRE-ISSUANCE REVIEW

November 27, 2017

Introduction

In 2017, Renovate America developed the HERO 2017 Green Bond Framework under which it intends to issue multiple series of green notes (“HERO Green Bonds”) through its ABS platform called Home Energy Renovation Opportunity (“HERO”) Funding. In October 2017, Renovate America engaged Sustainalytics to review projects funded by the third issuance in 2017 under the HERO Green Bond Framework (HERO Funding 2017-3), and provide an assessment as to whether the projects and transparency requirements of the issuance meet the criteria and the reporting commitments outlined in the [HERO Green Bond Framework Overview and Second-Party Opinion](#) provided by Sustainalytics. This document should be read in conjunction with the HERO Green Bond Framework.

Scope of Evaluation

Sustainalytics evaluated the underlying projects that will be funded through the HERO Funding 2017-3 issuance in November 2017 for compliance based on whether:

1. The products are aligned with the Use of Proceeds Eligibility Criteria outlined in the HERO Green Bond Framework Overview;
2. The estimated environmental impact of the HERO Funding 2017-3 issuance is reported based on one of the twelve Key Performance Indicators (KPIs) outlined in the HERO Green Bond Framework Overview; and
3. The commitments to select projects and manage proceeds from the HERO Funding 2017-3 issuance are aligned with the commitments described in the HERO Green Bond Framework Overview

Appendix 1 lists all the Use of Proceeds and Eligibility Criteria, while Appendix 2 lists the associated KPIs.

Issuing Entity’s Responsibility

Renovate America is responsible for providing accurate information and documentation relating to the details of the projects that have been funded, including description of eligible products, amount of PACE assessments outstanding, and project impact. This information was provided to Sustainalytics to support its review. Renovate America is also responsible for confirming to Sustainalytics that processes for project selection and management of proceeds for the 2017-3 issuance will remain aligned with the commitments described in the HERO Green Bond Framework.

Independence and Quality Control

Sustainalytics, a leading provider of ESG and corporate governance research and ratings to investors, conducted the verification of Renovate America’s 2017-3 Green Bond and provided an independent opinion. The work undertaken as part of this engagement included conversations with relevant Renovate America employees and review of relevant documentation to confirm the alignment with the HERO Green Bond Framework. Sustainalytics made all efforts to ensure the highest quality and rigor during its assessment process and enlisted its Green and Social Bonds Review Committee to provide oversight over the assessment of the review.

Conclusion

In addition to financing products from the California Eligible Products List described in the HERO Green Bond Framework Overview, The HERO Funding 2017-3 Class A notes will also finance products that meet the eligibility criteria from the Missouri HERO Program Eligible Products List. Both Eligible Product Lists are provided below in Appendix 3 and Appendix 4. Based on the limited assurance procedures conducted¹, nothing has come to Sustainalytics' attention that causes us to believe that, in all material respects, the reviewed bond projects that will be funded through proceeds of Renovate America's HERO Funding 2017-3 Class A notes are not in conformance with the Use of Proceeds and Reporting criteria outlined in the HERO Green Bond Framework. Renovate America has also confirmed to Sustainalytics that the proceeds of the HERO Funding 2017-3 Class A notes will be managed in alignment with the commitments described in the HERO Green Bond Framework.

Appendix 1: Use of Proceeds Eligibility Criteria

To be eligible to be funded by the proceeds, the projects funded must fall within the following product categories:

1. Renewable & Alternative Energy Products

- a. Solar Photovoltaic Systems
- b. Solar Thermal
- c. Advanced Energy Storage System - Electric Vehicle Charging Station
- d. Stationary Fuel Cell Power System

2. Energy Efficiency Products

- a. High-Efficiency Heating, Ventilation, and Air Conditioning (HVAC)
- b. Building Envelope (Insulation, Cool Roofing, Air Sealing, etc.)
- c. High-Efficiency Lighting
- d. High-Efficiency Pool Equipment
- e. High-Efficiency Water Heating
- f. Windows, Doors, and Skylights

3. Water Efficiency Products

- a. Indoor Water Efficient Fixture & Fittings
- b. Outdoor Water Efficient Landscaping

Improvements that are required for the installation of product types falling into one or more of the previous 3 categories are also eligible to be funded.

Appendix 2: Impact Statistics for HERO Funding Notes 2017-3

Environmental Impact			Impact Metrics	Impact Figures
Water Savings			Annual Water Savings (Gal)	52,448,328.00
			Lifetime Water Savings (Gal)	926,078,155.00
			Annual Water Bill Savings (USD)	236,401.72
			Lifetime Water Bill Savings (USD)	9,326,343.39
Energy Savings			Annual kWh Savings	29,001,839.38
			Annual Therm Savings	1,172,724.66
			Annual Energy Savings (kWh-e)	63,374,399.92
			Lifetime Energy Savings (kWh-e)	1,119,562,591.91
			Annual Energy Bill Savings (USD)	8,196,825.51
			Lifetime Energy Bill Savings (USD)	289,902,460.49
Greenhouse Emission Reduction	Gas (GHG)	Annual Emission Reduction (Tons)		16,929.89
		Lifetime Emission Reduction (Tons)		304,998.08

Appendix 3: California HERO Program Residential Eligible Product List

California HERO Program Residential Eligible Product List

All Products

In addition to the HERO Product Eligibility Specifications listed below, it is the sole responsibility of the HERO Contractor and property owner (Project Stakeholders) to meet or exceed applicable local, state, and/or federal permitting, codes, and standards. Project Stakeholders are fully and solely responsible for ensuring products are installed in accordance with all applicable manufacturer specifications, warranty guidelines, and industry best practices. All products are to be installed as real property that is not intended for removal over the useful life of the product.

Renewable and Alternative Energy

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Alternative Energy	Advanced Energy Storage System	<ol style="list-style-type: none"> System must be pre-approved and listed in the HERO Eligible Product Database System must have obtained certification from a nationally recognized testing laboratory for one of the acceptable standards: <ol style="list-style-type: none"> UL 1973 UL Subject 9540 IEC62842-2 IEC 62109 UL 1741 Other equivalent standard System must maintain roundtrip efficiency \geq 63.5% System must carry a minimum 10-year manufacturer warranty 	10
	Electric Vehicle Charging Station	<ol style="list-style-type: none"> Product must be certified as meeting the Underwriters Laboratory Subject 2594 Standard Testing for Charging Stations Product must be a Level 2 charger with SAE J1772 standard charging plug 	10
	Fuel Cell Power System	<ol style="list-style-type: none"> System must be certified as meeting the ANSI/CSA America FC1 standard 	15

California HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Alternative Energy	Small Wind Turbine	1. Product must be certified by the Small Wind Certification Council as meeting the requirements of the AWEA Small Wind Turbine Performance and Safety Standard (9.1-2009)	20
Solar Electric	Solar Inverter	1. Product must be listed as California Energy Commission as SB1-compliant product	20
	Solar Panel	1. Product must be listed as California Energy Commission as SB1-compliant product	25
Solar Thermal	Solar Pool Heater	1. Product must have the OG-100 Collector Certification by the Solar Rating and Certification Corporation (SRCC)	15
	Solar Water Heater	1. System must have the OG-300 System Certification by the Solar Rating and Certification Corporation (SRCC)	15

Energy Efficiency

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Building Envelope	Air Sealing	1. Air sealing should be performed to BPI, ENERGY STAR, and/or ASHRAE 62.2 guidelines for air sealing, ventilation, and weatherization	10
	Attic Insulation	1. R-value ≥ 38 2. Product should be installed following ENERGY STAR guidelines	25
	Cool Roof - Prescriptive	1. Product must be listed in the CRRC or ENERGY STAR product directories. 2. Low-Slope Roof ($\leq 2:12$) Efficiency: a. Aged (3 yrs.) Solar Reflectance ≥ 0.5 3. Steep-Slope Roof ($> 2:12$) Efficiency: a. Aged Solar Reflectance ≥ 0.15	25

California HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Building Envelope	Cool Roof - Performance	<ol style="list-style-type: none"> 1. If a Cool Roof - Prescriptive roofing product is not specified, one of the following performance measures must also be implemented in the scope of work: <ol style="list-style-type: none"> a. Provide an air-space of at least 1" between the top of the roof deck and the bottom of the roofing product b. Insulate attic floor to R-value ≥ 38 c. Seal & Insulate attic HVAC duct work to R-8 and $\leq 6\%$ leakage d. Install an eligible radiant barrier (Reflectivity ≥ 0.9 and Emittance ≤ 0.1) with reflective side facing air space e. Insulate above roof deck to R-value ≥ 4 f. Install roof construction with thermal mass with a weight of at least 25 lb/ft² 	25
	Heat Reflective/Cool Wall Coverings	<ol style="list-style-type: none"> 1. Product must be a preapproved HERO Cool Wall Coating product 2. Product must have solar reflectance ≥ 0.5 as tested to ASTM C1549-09 standard 3. Product primary application surface must be exterior wall surfaces of conditioned buildings 4. Trim, soffit, and/or fascia may be included in work scope as secondary items, as applicable 5. Product is <u>only</u> eligible to be installed on properties located within CA Building Climate Zones 4-10 and 12-15 	20
	Insulated Siding	<ol style="list-style-type: none"> 1. R-value ≥ 2 2. Certified as meeting ASTM D7793 standard and listed by Vinyl Siding Institute or certified as meeting an alternative equivalent standard 3. Primary application surface must be exterior walls of conditioned buildings 4. Trim, soffit, and/or fascia may be included in work scope as secondary items, as applicable 	25

California HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Building Envelope	Radiant Barrier	<ol style="list-style-type: none"> Radiant Barrier type products must be installed with reflective side facing an open-air space and meet the following performance ratings: <ol style="list-style-type: none"> Reflectivity ≥ 0.9 Emittance ≤ 0.1 Radiation Control Coating type products must be installed to face an open-air space and meeting the following performance ratings: <ol style="list-style-type: none"> Emittance ≤ 0.25 	20
	Under Floor Insulation	<ol style="list-style-type: none"> R-value ≥ 19 Product should be installed following ENERGY STAR guidelines 	25
	Wall Insulation	<ol style="list-style-type: none"> R-value ≥ 13 Product should be installed following ENERGY STAR guidelines 	25
Heating, Ventilation, and Air Conditioning (HVAC)	Air-Source Heat Pump	<ol style="list-style-type: none"> Product must be AHRI rated or pre-approved and listed in the HERO eligible product database. Efficiency requirements: <ol style="list-style-type: none"> Split System: <ul style="list-style-type: none"> SEER ≥ 14 HSPF ≥ 8.2 Package System: <ul style="list-style-type: none"> SEER ≥ 14 HSPF ≥ 8.0 	15
	Attic Fan	<ol style="list-style-type: none"> Product must be equipped with a thermostat control 	15
	Biomass / Wood Stove	<ol style="list-style-type: none"> Product must be certified and listed on the EPA Certified Wood Stoves list 	15
	Boiler	<ol style="list-style-type: none"> Product must be AHRI rated or pre-approved and listed in the HERO eligible product database. Efficiency Requirements: <ol style="list-style-type: none"> Oil: AFUE $\geq 80\%$ Gas: AFUE $\geq 75\%$ 	20
	Ceiling Fan	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified 	10

California HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Heating, Ventilation, and Air Conditioning (HVAC)	Central Air Conditioner	<ol style="list-style-type: none"> Product must be AHRI rated or pre-approved and listed in the HERO eligible product database. Efficiency Requirements: <ol style="list-style-type: none"> SEER \geq 14 <ul style="list-style-type: none"> Capacity < 45,000 <ul style="list-style-type: none"> EER \geq 12.2 Capacity \geq 45,000 <ul style="list-style-type: none"> EER \geq 11.7 	15
	Duct Replacement	<ol style="list-style-type: none"> Duct system leakage: <ol style="list-style-type: none"> Partial Replacement: \leq 15% total system nominal flow Full Replacement: \leq 6% total system nominal flow Duct Insulation R-Value \geq 6 	20
	Duct Sealing	<ol style="list-style-type: none"> Ducts should be sealed with UL-181 listed duct sealing materials (mastic, foil tape, duct board, aroeseal, etc.) 	20
	Evaporative Cooler	<ol style="list-style-type: none"> Product must be listed in California Energy Commission Appliance Efficiency Database Window installed product is <u>not</u> eligible 	10
	Furnace	<ol style="list-style-type: none"> Product must be AHRI rated or pre-approved and listed in the HERO eligible product database. Efficiency requirements: <ul style="list-style-type: none"> Oil: AFUE \geq 83% Gas: AFUE \geq 80% 	20

California HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Heating, Ventilation, and Air Conditioning (HVAC)	Geothermal Heat Pump	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified Closed Loop Water-to-Air Efficiency: <ol style="list-style-type: none"> EER \geq 14.1 COP \geq 3.3 Open Loop Water-to-Air Efficiency: <ol style="list-style-type: none"> EER \geq 16.2 COP \geq 3.6 Closed Loop Water-to-Water Efficiency: <ol style="list-style-type: none"> EER \geq 15.1 COP \geq 3.0 Open Loop Water-to-Water Efficiency: <ol style="list-style-type: none"> EER \geq 19.1 COP \geq 3.4 DGX Efficiency: <ol style="list-style-type: none"> EER \geq 15.0 COP \geq 3.5 	15
	Heat/Energy Recovery Ventilator	<ol style="list-style-type: none"> Product must be certified by the Home Ventilation Institute (HVI) 	10
	Hydronic Radiant Heating System	<ol style="list-style-type: none"> System must be powered by one of the following high-efficiency heating sources: <ol style="list-style-type: none"> Boiler (AFUE \geq 85%) Gas Storage Water Heater (EF \geq 0.67) Gas Tankless Water Heater (EF \geq 0.90) Electric Heat Pump Water Heater (EF \geq 2) 	15
	Mini-Split Air Conditioner	<ol style="list-style-type: none"> Product must be AHRI rated or pre-approved and listed in the HERO eligible product database. Efficiency requirement: <ol style="list-style-type: none"> SEER \geq 14 	15
	Mini-Split Heat Pump	<ol style="list-style-type: none"> Product must be AHRI rated or pre-approved and listed in the HERO eligible product database. Efficiency requirements: <ol style="list-style-type: none"> SEER \geq 14 HSPF \geq 8.2 	15
	Ventilation Fan	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified 	10
	Whole House Fan	<ol style="list-style-type: none"> Product must be listed in California Energy Commission Appliance Efficiency Database 	20

California HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Lighting	Lighting Control	<ol style="list-style-type: none"> Product must be listed in the California Energy Commission Appliance Efficiency Database. Eligible control types include: <ol style="list-style-type: none"> Automatic Time-Switch Daylight/Photo-Sensor Dimmer Occupant/Motion/Vacancy Sensor 	20
	Lighting Fixture	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified 	20
Pool Equipment	Automatic Pool Cover	<ol style="list-style-type: none"> Product must be UL certified as meeting ASTM F1346 Standard Performance Specification 	10
	Electric Heat Pump Pool Heater	<ol style="list-style-type: none"> Product must be listed in California Energy Commission Appliance Efficiency Database COP \geq 4.5 	10
	Gas Pool Heater	<ol style="list-style-type: none"> Product must be listed in California Energy Commission Appliance Efficiency Database Thermal Efficiency \geq 83% 	10
	Pool Pump	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified Single Speed Pump Efficiency: <ol style="list-style-type: none"> EF \geq 3.8 Multi-Speed Pump Efficiency: <ol style="list-style-type: none"> EF \geq 3.8 for most efficient speed 	10
Water Heating	Electric Heat Pump Storage Water Heater	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified Efficiency: <ol style="list-style-type: none"> EF \geq 2.0 	10
	Gas Storage Water Heater	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified Efficiency: <ol style="list-style-type: none"> EF \geq 0.67 	10
	Gas Tankless Water Heater	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified Efficiency: <ol style="list-style-type: none"> EF \geq 0.90 	10

California HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Water Heating	Hot Water Delivery System	<ol style="list-style-type: none"> System must meet the EPA WaterSense Guide for Efficient Hot Water Delivery Systems definition for one of the following water delivery options: <ol style="list-style-type: none"> Dedicated Recirculation Line Whole House Manifold System Demand-initiated Recirculating System Core Plumbing System 	25
Windows, Doors, and Skylights	Door	<ol style="list-style-type: none"> Product must be NFRC Certified Opaque (No Glass) Efficiency: <ol style="list-style-type: none"> U-Factor ≤ 0.17 SHGC = Any $\leq 1/2$-Lite (Some Glass) Efficiency: <ol style="list-style-type: none"> U-Factor ≤ 0.25 SHGC ≤ 0.25 $> 1/2$-Lite (Mostly Glass) Efficiency: <ol style="list-style-type: none"> U-Factor ≤ 0.30 SHGC ≤ 0.25 	25
	Exterior Window Shading Device	<ol style="list-style-type: none"> Product must shade to at least one window or door Product must be one of the following styles: <ol style="list-style-type: none"> Patio Cover Fixed Awning Operable Awning Operable Shutter Solar Screen Product is <u>NOT</u> eligible to be installed on properties located within LA County or California Building Climate Zones 1, 3-5 Other exterior structural products including, but not limited to, sunroom enclosures, exterior decks, balconies, roof overhangs, detached/free-standing arbors, detached/free-standing pergolas, and/or carports are <u>NOT</u> eligible Interior window shading products are <u>NOT</u> eligible 	10

California HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Windows, Doors, and Skylights	Skylights and Tubular Daylighting Device	<ol style="list-style-type: none"> Product must be NFRC Certified Efficiency: <ol style="list-style-type: none"> U-Factor ≤ 0.53 SHGC ≤ 0.28 	20
	Window	<ol style="list-style-type: none"> Product must be NFRC Certified Efficiency: <ol style="list-style-type: none"> U-Factor ≤ 0.30 SHGC ≤ 0.25 	25
	Window Film	<ol style="list-style-type: none"> Product must be NFRC Certified 	10

Water Efficiency

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Indoor Water Efficiency	Faucet	<ol style="list-style-type: none"> Product must be WaterSense Qualified Flow rate ≤ 1.5 GPM Must be permanently installed 	15
	Gray Water System	<ol style="list-style-type: none"> System must meet California Plumbing Code, Chapter 16A Eligible system types include: <ol style="list-style-type: none"> Single Fixture Multi-Fixture Simple (≤ 250 GPD) Multi-Fixture Complex (> 250 GPD) 	20
	Showerhead	<ol style="list-style-type: none"> Product must be WaterSense Qualified Flow rate ≤ 2.0 GPM 	15
	Toilet	<ol style="list-style-type: none"> Product must be WaterSense Qualified Toilet and urinals fixtures are eligible Flow rate ≤ 1.28 GPF 	20
Outdoor Water Efficiency	Artificial Turf	<ol style="list-style-type: none"> Product must be water and air permeable Product must be non-toxic and lead free Product installation must carry ≥ 10 year warranty 	10

California HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Outdoor Water Efficiency	Artificial Turf Premium	<ol style="list-style-type: none"> 1. Product must be water and air permeable 2. Product must be non-toxic and lead free 3. Product installation must carry \geq 15 year warranty 	15
	Drip Irrigation	<ol style="list-style-type: none"> 1. Product installed in turf, garden, planter, or flower bed area 	10
	Drought Tolerant Landscaping	<ol style="list-style-type: none"> 1. Product installation area must replace existing live turf grass or other irrigated area 2. Products must be installed to limit excess site runoff 3. Requested financing amount may only include: <ol style="list-style-type: none"> a. Removal of existing landscape material b. Site preparation for installation c. Installation of eligible hardscape/ groundcover material d. Installation of eligible irrigation options 4. Requested finance amount may <u>NOT</u> include: <ol style="list-style-type: none"> a. Installation of live plants or biodegradable plant material b. Removal/replacement of pre-existing hardscape areas (i.e. driveways, pools, etc.) c. Installation of water features (i.e. ponds, fountains, etc.) d. Installation of any other products not listed in specification #3 <p>Full Specifications</p>	20
	Rainwater Catchment System	<ol style="list-style-type: none"> 1. Sized to hold \geq 50 gallons at one time 2. Must be permanently installed 	20
	Sprinkler Nozzle	<ol style="list-style-type: none"> 1. Product must be on SoCal Water Smart Qualified Sprinkler Nozzle product list 	10
	Weather-Based Irrigation Controller	<ol style="list-style-type: none"> 1. Product must be WaterSense Qualified 	10

Appendix 4: Missouri HERO Program Residential Eligible Product List

Missouri HERO Program Residential Eligible Product List

All Products

In addition to the HERO Product Eligibility Specifications listed below, it is the sole responsibility of the HERO Contractor and property owner (Project Stakeholders) to meet or exceed applicable local, state, and/or federal permitting, codes, and standards. Project Stakeholders are fully and solely responsible for ensuring products are installed in accordance with all applicable manufacturer specifications, warranty guidelines, and industry best practices. All products are to be installed as real property that is not intended for removal over the useful life of the product.

Renewable and Alternative Energy

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Alternative Energy	Advanced Energy Storage System	<ol style="list-style-type: none"> System must be pre-approved and listed in the HERO Eligible Product Database System must have obtained certification from a nationally recognized testing laboratory for one of the acceptable standards: <ol style="list-style-type: none"> UL 1973 UL Subject 9540 IEC62842-2 IEC 62109 UL 1741 Other equivalent standard System must maintain roundtrip efficiency \geq 63.5% System must carry a minimum 10-year manufacturer warranty 	10
	Electric Vehicle Charging Station	<ol style="list-style-type: none"> Product must be certified as meeting the Underwriters Laboratory Subject 2594 Standard Testing for Charging Stations Product must be a Level 2 charger with SAE J1772 standard charging plug 	10
	Fuel Cell Power System	<ol style="list-style-type: none"> System must be certified as meeting the ANSI/CSA America FC1 standard 	15

Missouri HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Alternative Energy	Small Wind Turbine	1. Product must be certified by the Small Wind Certification Council as meeting the requirements of the AWEA Small Wind Turbine Performance and Safety Standard (9.1-2009)	20
Solar Electric	Solar Inverter	1. Product must be listed as California Energy Commission as SB1-compliant product	20
	Solar Panel	1. Product must be listed as California Energy Commission as SB1-compliant product	20
Solar Thermal	Solar Pool Heater	1. Product must have the OG-100 Collector Certification by the Solar Rating and Certification Corporation (SRCC)	15
	Solar Water Heater	1. System must have the OG-300 System Certification by the Solar Rating and Certification Corporation (SRCC)	15

Energy Efficiency

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Building Envelope	Air Sealing	1. Air sealing should be performed to BPI, ENERGY STAR, and/or ASHRAE 62.2 guidelines for air sealing, ventilation, and weatherization	10
	Attic Insulation	1. R-value ≥ 38 2. Product should be installed following ENERGY STAR guidelines	20
	Cool Roof - Prescriptive	1. Product must be listed in the CRRC and/or ENERGY STAR product directories 2. Low-Slope Roof ($\leq 2:12$) Efficiency Rating: a. Aged (3 yrs.) Solar Reflectance ≥ 0.5 3. Steep-Slope Roof ($> 2:12$) Efficiency Rating: a. Aged Solar Reflectance ≥ 0.15	20

Missouri HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Building Envelope	Cool Roof - Performance	<ol style="list-style-type: none"> 1. If a Cool Roof - Prescriptive roofing product is not specified, one of the following performance measures must also be implemented in the scope of work: <ol style="list-style-type: none"> a. Provide an air-space of at least 1" between the top of the roof deck and the bottom of the roofing product b. Insulate attic floor to R-value ≥ 38 c. Install an eligible radiant barrier (Reflectivity ≥ 0.9 and Emittance ≤ 0.1) with reflective side facing air space d. Insulate above roof deck to R-value ≥ 4 e. Install roof construction with thermal mass with a weight of at least 25 lb/ft² 	20
	Insulated Siding	<ol style="list-style-type: none"> 1. R-value ≥ 2 2. Certified as meeting ASTM D7793 standard and listed by Vinyl Siding Institute or certified as meeting an alternative equivalent standard 3. Primary application surface must be exterior walls of conditioned buildings 4. Trim, soffit, and/or fascia may be included in work scope as secondary items, as applicable 	20
	Radiant Barrier	<ol style="list-style-type: none"> 1. Radiant Barrier type products must be installed with reflective side facing an open-air space and meet the following performance ratings: <ol style="list-style-type: none"> a. Reflectivity ≥ 0.9 b. Emittance ≤ 0.1 2. Radiation Control Coating type products must be installed to face an open-air space and meeting the following performance ratings: <ol style="list-style-type: none"> a. Emittance ≤ 0.25 	20
	Under Floor Insulation	<ol style="list-style-type: none"> 1. R-value ≥ 25 2. Product should be installed following ENERGY STAR guidelines 	20
	Wall Insulation	<ol style="list-style-type: none"> 1. R-value ≥ 13 2. Product should be installed following ENERGY STAR guidelines 	20

Missouri HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Heating, Ventilation, and Air Conditioning (HVAC)	Air Source Heat Pump	<ol style="list-style-type: none"> Product must be AHRI Certified Split System Efficiency: <ol style="list-style-type: none"> SEER \geq 15 EER \geq 12.5 HSPF \geq 8.5 Package System Efficiency: <ol style="list-style-type: none"> SEER \geq 15 EER \geq 12 HSPF \geq 8.2 	15
	Attic Fan	<ol style="list-style-type: none"> Product must be equipped with a thermostat control 	15
	Biomass / Wood Stove	<ol style="list-style-type: none"> Product must be certified and listed on the EPA Certified Wood Stoves list 	15
	Boiler	<ol style="list-style-type: none"> Product must be AHRI Certified Efficiency: <ol style="list-style-type: none"> AFUE \geq 85% 	20
	Ceiling Fan	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified 	10
	Central Air Conditioner	<ol style="list-style-type: none"> Product must be AHRI Certified Split System Efficiency: <ol style="list-style-type: none"> SEER \geq 15 EER \geq 12.5 Package System Efficiency: <ol style="list-style-type: none"> SEER \geq 15 EER \geq 12 	15
	Duct Replacement	<ol style="list-style-type: none"> Duct system leakage: <ol style="list-style-type: none"> Partial Replacement: \leq 15% total system nominal flow Full Replacement: \leq 6% total system nominal flow Duct Insulation R-Value \geq 6 	20
	Duct Sealing	<ol style="list-style-type: none"> Ducts should be sealed with UL-181 listed duct sealing materials (mastic, foil tape, duct board, arosetal, etc.) 	20

Missouri HERO Program Residential Eligible Product List

PRODUCT CATEGORY	PRODUCT TYPE	ELIGIBILITY SPECIFICATIONS	MAXIMUM TERM (YEARS)
Heating, Ventilation, and Air Conditioning (HVAC)	Evaporative Cooler	<ol style="list-style-type: none"> Product must be listed in California Energy Commission Appliance Efficiency Database Window installed product is <u>not</u> eligible 	10
	Furnace	<ol style="list-style-type: none"> Product must be AHRI Certified Efficiency if equipped with ECM: <ol style="list-style-type: none"> AFUE \geq 85% Efficiency if not equipped with ECM: <ol style="list-style-type: none"> AFUE \geq 95% 	20
	Geothermal Heat Pump	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified Closed Loop Water-to-Air Efficiency: <ol style="list-style-type: none"> EER \geq 14.1 COP \geq 3.3 Open Loop Water-to-Air Efficiency: <ol style="list-style-type: none"> EER \geq 16.2 COP \geq 3.6 Closed Loop Water-to-Water Efficiency: <ol style="list-style-type: none"> EER \geq 15.1 COP \geq 3.0 Open Loop Water-to-Water Efficiency: <ol style="list-style-type: none"> EER \geq 19.1 COP \geq 3.4 DGX Efficiency: <ol style="list-style-type: none"> EER \geq 15.0 COP \geq 3.5 	15
	Heat/Energy Recovery Ventilator	<ol style="list-style-type: none"> Product must be certified by the Home Ventilation Institute (HVI) 	10
	Hydronic Radiant Heating System	<ol style="list-style-type: none"> System must be powered by one of the following high-efficiency heating sources: <ol style="list-style-type: none"> Boiler (AFUE \geq 85%) Gas Storage Water Heater (EF \geq 0.67) Gas Tankless Water Heater (EF \geq 0.90) Electric Heat Pump Water Heater (EF \geq 2) 	15
	Mini-Split Air Conditioner	<ol style="list-style-type: none"> Product must be AHRI certified Efficiency: <ol style="list-style-type: none"> SEER \geq 15 	15

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Heating, Ventilation, and Air Conditioning (HVAC)	Mini-Split Heat Pump	<ol style="list-style-type: none"> Product must be AHRI certified Efficiency: <ol style="list-style-type: none"> SEER \geq 15 HSPF \geq 8.5 	15
	Ventilation Fan	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified 	10
	Whole House Fan	<ol style="list-style-type: none"> Product must be listed in California Energy Commission Appliance Efficiency Database 	20
Lighting	Lighting Control	<ol style="list-style-type: none"> Product must be listed in the California Energy Commission Appliance Efficiency Database. Eligible control types include: <ol style="list-style-type: none"> Automatic Time-Switch Daylight/Photo-Sensor Dimmer Occupant/Motion/Vacancy Sensor 	20
	Lighting Fixture	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified 	20
Pool Equipment	Automatic Pool Cover	<ol style="list-style-type: none"> Product must be UL certified as meeting ASTM F1346 Standard Performance Specification 	10
	Electric Heat Pump Pool Heater	<ol style="list-style-type: none"> Product must be listed in California Energy Commission Appliance Efficiency Database COP \geq 4.5 	10
	Gas Pool Heater	<ol style="list-style-type: none"> Product must be listed in California Energy Commission Appliance Efficiency Database Thermal Efficiency \geq 83% 	10
	Pool Pump	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified Single Speed Pump Efficiency: <ol style="list-style-type: none"> EF \geq 3.8 Multi-Speed Pump Efficiency: <ol style="list-style-type: none"> EF \geq 3.8 for most efficient speed 	10

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Wastewater Treatment	Septic System Rejuvenation	<ol style="list-style-type: none"> Product must include a custom product application and specifications that meet the following criteria: <ol style="list-style-type: none"> Motor: Less than 0.5 HP Variable Speed Control Modulating On and Off Recirculation Less than 270 kWh per month of energy consumption Product that meet the definition of a residential microbial inoculator/generator system Requested financing amount may only include: <ol style="list-style-type: none"> Installation of the rejuvenation system to an existing residential treatment tank Components and modules such as microbial inoculator/generator system and aerobic bio-reactor that are required for septic system rejuvenation Requested financing amount may NOT include: <ol style="list-style-type: none"> Installation or replacement of a septic tank 	20
Water Heating	Electric Heat Pump Storage Water Heater	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified Efficiency: <ol style="list-style-type: none"> EF \geq 2.0 	10
	Gas Storage Water Heater	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified Efficiency: <ol style="list-style-type: none"> EF \geq 0.67 	10
	Gas Tankless Water Heater	<ol style="list-style-type: none"> Product must be ENERGY STAR Certified Efficiency: <ol style="list-style-type: none"> EF \geq 0.90 	10
	Hot Water Delivery System	<ol style="list-style-type: none"> System meets the EPA WaterSense Guide for Efficient Hot Water Delivery Systems definition for one of the following water delivery options: <ol style="list-style-type: none"> Dedicated Recirculation Line Whole House Manifold System Demand-initiated Recirculating System Core Plumbing System 	15

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Windows, Doors, and Skylights	Door	<ol style="list-style-type: none"> Product must be NFRC Certified Opaque (No Glass) Efficiency: <ol style="list-style-type: none"> U-Factor ≤ 0.17 SHGC = Any $\leq 1/2$-Lite (Some Glass) Efficiency: <ol style="list-style-type: none"> U-Factor ≤ 0.25 SHGC ≤ 0.25 $> 1/2$-Lite (Mostly Glass) Efficiency: <ol style="list-style-type: none"> U-Factor ≤ 0.30 SHGC ≤ 0.40 	20
	Exterior Window Shading Device	<ol style="list-style-type: none"> Product must shade to at least one window or door Product must be one of the following styles: <ol style="list-style-type: none"> Patio Cover Fixed Awning Operable Awning Operable Shutter Solar Screen Other exterior structural products including, but not limited to, sunroom enclosures, exterior decks, balconies, roof overhangs, detached/free-standing arbors, detached/free-standing pergolas, and/or carports are <u>NOT</u> eligible Interior window shading products are <u>NOT</u> eligible 	10
	Skylights and Tubular Daylighting Device	<ol style="list-style-type: none"> Product must be NFRC Certified Efficiency: <ol style="list-style-type: none"> U-Factor ≤ 0.53 SHGC ≤ 0.35 	20
	Window	<ol style="list-style-type: none"> Product must be NFRC Certified Efficiency: <ol style="list-style-type: none"> U-Factor ≤ 0.30 SHGC ≤ 0.40 	20
	Window Film	<ol style="list-style-type: none"> Product must be NFRC Certified 	10

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