

DRAFT National ERI Target Procedure (ANSI 301-2019) ENERGY STAR Multifamily New Construction, Version 1.2 (Rev. 02)

National ERI Target Procedure for use with ANSI/RESNET/ICC 301-2019

This document provides detailed instructions for determining the ENERGY STAR ERI Target, the highest ERI value that each rated multifamily unit, excluding townhouses, may achieve to earn the ENERGY STAR. Note that, in addition to meeting the ENERGY STAR ERI Target for each unit, units shall also meet all Mandatory Requirements for All Multifamily New Construction Projects in Exhibit 2 of the National Program Requirements for ENERGY STAR Multifamily New Construction, Version 1 / 1.1 / 1.2 While Townhouses are eligible to earn ENERGY STAR Multifamily New Construction by meeting their ENERGY STAR ERI Target and also meeting all Mandatory Requirements for All Multifamily New Construction Projects in Exhibit 2 of the National Program Requirements, the instructions for determining their ENERGY STAR ERI Target is in the National ERI Target Procedure for ENERGY STAR Single-Family New Homes.

An EPA-recognized Home Certification Organization's (HCO) Approved Software Rating Tool shall automatically determine (i.e., without relying on a user-configured ENERGY STAR Multifamily Reference Design) this target for each Rated Unit. This shall be done by configuring the ENERGY STAR Multifamily Reference Design in accordance with Exhibit 1, the Expanded ENERGY STAR Multifamily Reference Design Definition, and calculating its associated ERI value. The ERI value shall be calculated using ANSI / RESNET / ICC Standard 301-2019 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the implementation schedule defined by the HCO that the building is being certified under. RESNET interpretations of Standard 301-2019 shall also be followed. Any exceptions shall be approved by EPA and reported at www.energystar.gov/ERIExceptions. This value, rounded to the nearest whole number, shall equal the ENERGY STAR ERI Target.

The National ERI Target Procedure (ANSI 301-2014) must instead be used to determine the ENERGY STAR ERI Target when using ANSI / RESNET / ICC Standard 301-2014.



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Exhibit 1: Expanded ENERGY STAR Multifamily Reference Design Definition

Building	I. Expanded ENERGY STAR Mult	indining i	1010101	00 200	.g., 201111	111011						
Component	Expanded ENERGY STAR Multifamily Reference Design Definition ¹											
Foundations:	Construction Type & Structural Mass: Same as Rated Unit ² , except:											
	For masonry floor slabs, modeled with 80% of floor area covered by carpet and 20% of floor directly exposed to room air Conditioning Types Come on Dated Unit 2 exposets.											
	Conditioning Type: Same as Rated Unit ² , except: • Crawlspaces shall be modeled as vented with net free vent aperture = 1sq. ft. per 150 sq. ft. of crawlspace floor area											
	Crawispaces shall be modeled as vented with net free vent aperture = 1sq. it. per 150 sq. it. of crawispace floor area Gross Area: Same as Rated Unit ²											
	Insulation: 3,4 Choose appropriate insulation le											
	Basement Wall Continuous Insulation R-	Value only a	pplies to c	onditioned	basements;	if applicable, insulati	on shall be	ocated on i	nterior			
		side of walls										
	 Floor assemblies above crawlspace foundations shall be configured to meet the applicable floor assembly U-factor listed in the building component section for Floors Over Unconditioned Spaces and crawlspace walls shall be uninsulated 											
	Slab floors with a floor surface less than 24" below grade shall be insulated to the Slab Insulation R-value. The insulation shall extend											
	downward from the top of the slab on the											
	Climate Zone: 5	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
	Slab Insulation R-Value: Slab Insulation Depth (ft):	0 0	0 0	10 2	10 4	10 4	10 4	10 4	10 4			
	Basement Wall Assembly U-Factor:	0.360	0.360	0.091	0.059	0.050	0.050	0.050	0.050			
Floors Over	Construction Type: Wood frame											
Unconditioned	Gross Area: Same as Rated Unit ²											
Space Volumes,	Insulation: 3, 4											
Non-Freezing	Climate Zone: ⁵	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
Space or												
outdoor	Floor Assembly U-Factor:	0.064	0.064	0.047	0.047	0.033	0.033	0.028	0.028			
environment:		•										
Above-Grade Walls,	Interior and Exterior Construction Type: Wood Gross Area: Same as Rated Unit ²	trame										
adjacent to	Solar Absorptance = 0.75											
Exterior or	Emittance = 0.90											
Garage:	Insulation: 1, 3											
	Climate Zone: 5	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
	Wall Assembly U-Factor:	0.084	0.084	0.060	0.045	0.045	0.045	0.045	0.045			
Thermally Isolated Sunrooms:	None											
Doors: 5	Area: Same as Rated Unit 2, with door seal pro			nize air lea	kage betwee	n the door and door	frame, to av	oid the 140	CFM50			
	addition to measured airflow per ANSI / RESN	ET / ICC Sto	d. 380									
	Orientation: Same as Rated Unit ² Door Type:	Opaque		≤ 1/2-Lite		> 1/2-Lite CZ 1-3		> 1/2-Lite (C7 4 0			
	U-Factor:	0.17	,	0.25		0.30		0.30				
	SHGC:	n/a).25	0.25		0.40				
Glazing: 5	Total Area: AG = 0.15 x CFA x FA x F, without		available w	/all area ⁸								
	Orientation: Same as Rated Unit ² , by percentage of area											
	Interior Shade Coefficient: Same as Energy Ra	ating Refere	nce Home	, as defined	d by ANSI / R	RESNET / ICC Std. 3	01					
	External Shading: None	C7.4	C7.2	C7 2	C7.4	C7.4.C.9.E	C7 6	C7 7	C7 0			
	Climate Zone: ⁵ U-Factor:	CZ 1 0.40	CZ 2 0.40	CZ 3 0.30	CZ 4 0.30	CZ 4 C & 5 0.27	CZ 6 0.27	CZ 7 0.27	CZ 8 0.27			
	SHGC:	0.40	0.40	0.30	0.40	0.40	0.40	0.40	0.40			
	Class AW Assembly U-Factors (i.e., Structural				U. 10	0.10	3.10	J. 10	0.10			
	Climate Zone: 5	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
	Fixed Window U-Factor:	0.48	0.43	0.40	0.34	0.34	0.32	0.28	0.27			
	Operable Window U-Factor:	0.59	0.57	0.51	0.43	0.43	0.40	0.34	0.30			
	SHGC:	0.25	0.25	0.25	0.40	0.40	0.40	0.40	0.40			
Skylights:	None Construction Type: Wood frame											
Ceilings, adjacent to	Construction Type: Wood frame Gross Area: Same as Rated Unit ²											
Exterior or	Insulation: 1, 3											
Unconditioned	Climate Zone: 5	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
Space		0.035	0.026	0.024	0.024	0.024	0.024	0.024	0.024			
	I Calling Assembly II-Factor		0.020	0.024	0.02-	0.024	0.024	0.024	0.024			
Volumes: Attics:	Ceiling Assembly U-Factor: Construction Type: Vented with aperture = 1sq		sa, ft ceil	ng area ^{1, 9})							
Attics:	Construction Type: Vented with aperture = 1sq Radiant Barrier: None	. ft. per 300		ing area ^{1, 9})							
	Construction Type: Vented with aperture = 1sq Radiant Barrier: None Construction Type: Composition shingle on wo	. ft. per 300		ng area ^{1, 9})							
Attics:	Construction Type: Vented with aperture = 1sq Radiant Barrier: None Construction Type: Composition shingle on wo Gross Area: Same as Rated Unit ²	. ft. per 300		ing area ^{1, g})							
Attics:	Construction Type: Vented with aperture = 1sq Radiant Barrier: None Construction Type: Composition shingle on wo	. ft. per 300		ng area ^{1, g}	3							



ENERGY STAR Multifamily New Construction, Version 1.2 (Rev. 02)

Exhibit 1: Expanded ENERGY STAR Multifamily Reference Design Definition (Continued)

Indanus - I	Come on Engage Detical Detaction 11	فالتناهما	ANICI / DECNIE	T / ICC Ct-1 CC4						
Internal Mass:	Same as Energy Rating Reference Home, as defined by ANSI / RESNET / ICC Std. 301									
Lighting,	Additional mass specifically designed as a Thermal Storage Element for the Rated Unit shall be excluded									
Appliances,	Lighting: Fraction of qualifying Tier I fixtures to all fixtures in qualifying light fixture locations 100% for interior; 100% for exterior and garage									
Fixtures &	Refrigerator: 450 kWh per year Dishwasher: Capacity: Same as Rated Unit ² or Standard capacity if no dishwasher installed in Rated Unit									
Internal	Dishwasher: Capacity: Same as Rated Unit ² , or Standard capacity if no dishwasher installed in Rated Unit For Standard capacity: LER = 270, GHWC = \$22.23, Elec\$ = \$0.12, Gas\$ = \$1.09, LCY = 208									
Gains:	\mathbf{I} To Standard Capacity. Lett \mathbf{I} 270, Ciriyo \mathbf{I} 422.25, Lieu \mathbf{I} 40.12, Casy \mathbf{I} 41.05, Let \mathbf{I} 200									
	Clothes Washer: If clothes washer present									
	same as Energy Rating Reference Home, a					. 0.0		,, 0		
	Clothes Dryer: Same as Energy Rating Ref				ICC Std. 301					
	Water fixtures: all showers and faucets ≤ 2.0 gpm									
	Internal Gains: Same as Energy Rating Reference Home, as defined by ANSI / RESNET / ICC Std. 301, except for adjustments for the lighting,									
	refrigerator, dishwasher, clothes washer, ar									
Heating	Heating capacity shall be selected in accord									
Systems:	ACCA Manual J, Eighth Edition, ASHRAE I degraded capacity from other-than-Grade I									
	Home. Where heat from a central boiler is of									
	the Rated Home in ANSI / RESNET / ICC S									
	separate heating systems: 1) a heat pump									
	boiler with the balance of the capacity of (1									
	Fuel Type: Same as Rated Unit, except Re									
	Installation Quality: For forced-air HVAC sy			fan airflow deviat	ion, Grade II 0.52 V	V / CFM blo	wer fan effic	iency, and		
	for air-source heat pumps, Grade III refriger System Type: Same as Rated Unit ² , excep			anfigured with ai	r course boot numr	whore Det	od Unit boo	olootrio		
	strip heat or electric baseboard heat; efficie			configured with ai	r-source near pump	where Rai	ed Unit has t	electric		
	Climate Zone: 5	CZ 1	CZ 2	CZ 3 CZ	4 CZ 4C & 5	CZ 6	CZ 7	CZ 8		
	Gas Furnace AFUE:	80	80	80 90		95	95	95		
	Gas Boiler AFUE:	80	80	80 90		95	95	95		
	Central Boiler, ≥ 300 KBtu/h Et:	80	80	80 86		95	95	95		
	Central Boiler w/WLHP, ≥ 300 KBtu/h E _t :		80	80 89		90	90	90		
	Air-Source Heat Pump HSPF:	9.2	9.2	9.2 9.		9.2	9.2	9.2		
	Air-Source Heat Pump Backup:	Electric	Electric	Electric Elec		Electric	Electric	Electric		
	Ground-Source Heat Pump COP:	2.7	2.7	2.7 2.		2.7	2.7	2.7		
	For non-electric warm air furnaces and non-electric boilers, serving the Rated Unit and no other units, the Electric Auxiliary Energy shall be									
1										
	determined in accordance with the methodo	ology for the Er	nergy Rating R	eference Home in	n ANSI / RESNET /	ICC Std. 30	01. For non-e	electric		
	determined in accordance with the methodo boilers and GSHPs, serving the Rated Unit	ology for the Er and other unit	nergy Rating R s through a sha	eference Home in ared circulation lo	n ANSI / RESNET / op, the Electric Aux	ICC Std. 30 ciliary Energ	01. For non-e y shall be de	electric etermined		
	determined in accordance with the methodo boilers and GSHPs, serving the Rated Unit in accordance with the methodology for the using 0.85 for motor efficiency and using th	ology for the En and other units Rated Home i e same HP as	nergy Rating R s through a sha n ANSI / RESN the pump serv	eference Home in ared circulation lo NET / ICC Std. 30 ing the Rated Uni	n ANSI / RESNET / op, the Electric Aux 1, using the same \$ it	ICC Std. 30 kiliary Energ Shared Pum	01. For non-e ly shall be de np Power (SF	electric etermined P _{kw}) OR		
Cooling	determined in accordance with the methodo boilers and GSHPs, serving the Rated Unit in accordance with the methodology for the using 0.85 for motor efficiency and using the Cooling capacity shall be selected in according	ology for the En and other units Rated Home in the same HP as dance with ACC	nergy Rating R s through a sha n ANSI / RESN the pump serv CA Manual S b	eference Home in ared circulation lo NET / ICC Std. 30 ing the Rated Uni ased on loads ca	n ANSI / RESNET / op, the Electric Aux 1, using the same s it lculated for the Ref	ICC Std. 30 ciliary Energ Shared Pum erence Des	01. For non-early shall be design Power (SF	electric etermined P _{kw}) OR dance with		
Cooling Systems:	determined in accordance with the methodo boilers and GSHPs, serving the Rated Unit in accordance with the methodology for the using 0.85 for motor efficiency and using the Cooling capacity shall be selected in accord ACCA Manual J, Eighth Edition, ASHRAE I	ology for the En and other units Rated Home i e same HP as dance with ACO Handbook of Fo	nergy Rating R s through a sha n ANSI / RESN the pump serv CA Manual S b undamentals, o	eference Home in ared circulation loo NET / ICC Std. 30 ing the Rated Unit ased on loads ca or an equivalent c	n ANSI / RESNET / op, the Electric Aux 1, using the same S it liculated for the Ref omputation proced	ICC Std. 30 kiliary Energ Shared Pum erence Des ure. For force	O1. For non-end shall be described by shall be described by shall be described. Shall be described by shall be	electric etermined P _{kw}) OR dance with		
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ENERGY STAR Multifamily New Construction, Version 1.2 (Rev. 02) Exhibit 1: Expanded ENERGY STAR Multifamily Reference Design Definition (Continued)

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Thermal Distribution Systems:	Duct Leakage to Outside: 0 CFM25 per 100 sq. ft. of conditioned floor area								
	Duct Insulation: None								
	Duct Surface Area: Same as I	Rated Unit ²							
	Supply and Return Duct Locations shall be 100% in conditioned space								
Thermostat:	Type: Programmable								
	Temperature Setpoints: Same as Energy Rating Reference Home, but with offsets for a programmable thermostat, as defined by ANSI / RESNET / ICC Std. 301								
Infiltration & Mechanical Ventilation:	Compartmentalization Rates: 0.3 cfm50/ft2 Enclosure Area, with Aext applied to calculate Infiltration Rate, in accordance with ANSI / RESNET / ICC Std. 301								
	Mechanical ventilation system without heat recovery								
	Rate: CFM = 0.01 * CFA + 7.5 * (Nbr + 1), where CFA = Conditioned Floor Area and Nbr = Number of Bedrooms; Runtime: 24 Hours / Day								
	Fan Watts: Watts = CFM Rate / 2.8 CFM per Watt, where CFM Rate is determined above								
	Climate Zone: 5	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8
	Ventilation Type:	Supply	Supply	Supply	Supply	Exhaust	Exhaust	Exhaust	Exhaust



Revised 3/1/2022



ENERGY STAR Multifamily New Construction, Version 1.2 (Rev. 02)

Footnotes:

- 1. Any parameter not specified in this exhibit shall be identical to the value entered for the Rated Unit. Where envelope building components do not exist in the Rated Unit, such as a foundation or slab, they should not be modeled in the ENERGY STAR Multifamily Reference Design, unless explicitly stated, such as vented attics where unvented attics are present in the Rated Unit. Where the envelope component is adiabatic in the Rated Unit, it shall also be adiabatic in the Multifamily Reference Design. Where the envelope component is not adiabatic but is adjacent to a space other than those specified in the Building Component column of Exhibit 1, model as uninsulated in the Reference Design.
- 2. "Same as Rated Unit" indicates that the parameter shall be identical to the value entered for the Rated Unit.
- 3. Slab insulation R-values represent nominal insulation levels; and assembly U-factors for foundations, floors, walls, and ceilings represent the overall assembly, inclusive of sheathing materials, cavity insulation, installation quality, framing, and interior finishes.
- 4. If software allows the user to specify the thermal boundary location independent of the conditioned space boundary in the basement of the Rated Unit, then the thermal boundary of the ENERGY STAR Multifamily Reference Design shall be aligned with this boundary. For example, if the thermal boundary is located at the walls, then the wall insulation shall be configured as if it was a conditioned basement. If the thermal boundary is located at the floor above the basement, then the floor insulation shall be configured as if it was a floor over an unconditioned space.
- 5. Note that, for the purposes of the ENERGY STAR Reference Design, the slab insulation R-value and depth shall be modeled even in jurisdictions designated by a code official as having Very Heavy Termite Infestation for the purpose of determining the ENERGY STAR ERI Target. This is in contrast to the total UA limit in support of Item 3.1 of the National Rater Design Review Checklist, which when calculated at a unit level shall be calculated by replacing the code-required slab insulation R-value and depth with the slab insulation R-value and depth specified in the Rated Unit for such jurisdictions.
- 2021 IECC Climate Zone designations, as defined and illustrated in <u>Section R301</u> of the code, shall be used to configure the ENERGY STAR Reference Design. Note that some locations have shifted to a different Climate Zone in the 2021 IECC compared to prior editions.
- 7. Note that the U-factor requirement applies to all fenestration while the SHGC only applies to the glazed portion.
- 8. When determining the ENERGY STAR ERI Target, the following formula shall be used to determine total window area of the ENERGY STAR Multifamily Reference Design:

 $AG = 0.15 \times CFA \times FA \times F$

Where:

- AG = Total glazing area
- CFA = Total conditioned floor area
- FA = (Gross above-grade thermal boundary wall area) / (Gross above-grade boundary wall area + 0.5 x Gross below-grade thermal boundary wall area)
- F = 1- 0.44 x (Gross common wall area) / (Gross above-grade thermal boundary wall area + Gross common wall area)

And where:

- Thermal boundary wall is any wall that separates conditioned space from unconditioned space, outdoor environment, or the surrounding soil;
- Above-grade thermal boundary wall is any portion of a thermal boundary wall not in contact with soil;
- Below-grade boundary wall is any portion of a thermal boundary wall in soil contact; AND
- Common wall is the total wall area of walls adjacent to other conditioned space, not including foundation walls.
- 9. A vented unconditioned attic shall only be modeled in the Multifamily Reference Design where attics (of any type) exist in the Rated Unit or when specified as the Duct Location in the Thermal Distribution Systems section of this Exhibit. Where the Rated Unit has more than one ceiling type, the ceiling area used to calculate the vent aperture area shall be the area of the ceiling that is exposed to exterior, under attics, and/or under other unconditioned common spaces. Where the Rated Unit is entirely located beneath another dwelling unit or unrated conditioned space, no attic is modeled in the Reference Design.
- 10. Fuel type(s) shall be same as Rated Unit, including any dual-fuel equipment where applicable. For a Rated Unit with multiple heating, cooling, or water heating systems using different fuel types, the applicable system capacities and fuel types shall be weighted in accordance with the loads distribution (as calculated by accepted engineering practice for that equipment and fuel type) of the multiple systems, unless otherwise specified by ANSI / RESNET / ICC Std. 301.
- 11. For a Rated Unit without a heating system, the ENERGY STAR Multifamily Reference Design shall be configured with a 78% AFUE gas furnace system, unless the Rated Unit has no access to natural gas or fossil fuel delivery. In such cases, the ENERGY STAR Reference Multifamily Design shall be configured with a 7.7 HSPF air-source heat pump.
- 12. For a Rated Unit without a cooling system, the ENERGY STAR Multifamily Reference Design shall be configured with a 13 SEER electric air conditioner.
- 13. That is to say, representative of low-flow plumbing fixtures, reference or "Std-Present" Standard Clothes Washer Model gallons per day, standard distribution system water use effectiveness, a hot water piping ratio of 1.0, no pipe insulation, and no drain water heater recovery.

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