

National ERI Target Procedure (ANSI 301-2014) ENERGY STAR Multifamily New Construction, Version 1 (Rev. 01).

National ERI Target Procedure for use with ANSI/RESNET/ICC 301-2014

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 / OR-WA 1.2. While Townhouses are eligible to earn ENERGY STAR Multifamily New Construction certification 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 Certified Homes.

An EPA-recognized Verification Oversight Organization's Approved Software Reating Tool approved by an EPA-Approved Verification Oversight Organization 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 301-2014 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the Effective Date and Transition Period End Date defined by RESNET. RESNET interpretations of Standard 301-2014 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 301-2019) must instead be used to determine the ENERGY STAR ERI Target when using ANSI / RESNET / ICC Standard 301-2019.

Revised 10/1518/20182019



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Exhibit 1: Expanded ENERGY STAR Multifamily Reference Design Definition

Building 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 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											
	Gross Area: Same as Rated Unit ²											
	Insulation: 3,4 Choose appropriate insulation			and all Carriers of		Manualla de la Casada (
	Basement Wall Continuous Insulation side of walls	on R-Value only a	pplies to c	onditioned	basements;	if applicable, insulat	ion shall be l	ocated on i	nterior			
		foundations shall	l ha confia	urad ta ma	ot the applic	able floor accombly	I I factor listo	d in the bui	ildina			
	 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 											
	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 of											
	Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
	Slab Insulation R-Value:	0	0	0	10	10	15	15	20			
	Slab Insulation Depth (ft):	0	0	0	2	2	2	2	2			
	Basement Wall	0	0	0	7.5	7.5	7.5	10	12.5			
	Continuous Insulation R-Value:			Ů	7.0	7.0	7.0	10	12.0			
loors Over	Construction Type: Wood frame											
Inconditioned	Gross Area: Same as Rated Unit ²											
paces:	Insulation: 3, 4											
	Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
	Floor Assembly U-Factor:	0.282	0.052	0.033	0.033	0.033	0.033	0.033	0.033			
bove-Grade	Interior and Exterior Construction Type: V	Vood frame					-	-				
Valls:	Gross Area: Same as Rated Unit ²											
	Solar Absorptance = 0.75											
	Emittance = 0.90											
	Insulation: 3											
	Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
	Wall Assembly U-Factor:	0.089	0.089	0.089	0.064	0.051	0.051	0.051	0.036			
hermally	-											
solated	None											
Sunrooms:												
Doors:	Area: Same as Rated Unit ²											
	Orientation: Same as Rated Unit ²											
	U-Factors and SHGCs, based on ENERG	SY STAR doors: 5										
	Door Type:	•	aque			/2-Lite	>	1/2-Lite				
	U-Factor:		.21			0.27		0.32				
	SHGC:		/a			0.30		0.30				
Glazing:	Total Area: AG = 0.15 x CFA x FA x F, without exceeding available wall area 65											
	Orientation: Same as Rated Unit 2, by per											
	Interior Shade Coefficient: Same as Ener	gy Rating Referer	nce Home,	as defined	d by ANSI / F	RESNET / ICC Std. 3	301 [‡]					
	External Shading: None											
	Assembly U-Factors and SHGCs, based	on ENERGY STA	R Window	/S : ⁵								
	Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
	Olimate Zone.						0.30	0.30	0.30			
	U-Value:	0.60	0.60	0.35	0.32	0.30	0.00		0.40			
	U-Value: SHGC:	0.60 0.27	0.60 0.27	0.35 0.30	0.32 0.40	0.30 0.40	0.40	0.40	0. 10			
	U-Value:	0.60 0.27	0.60 0.27	0.35 0.30				0.40				
	U-Value: SHGC:	0.60 0.27	0.60 0.27	0.35 0.30				0.40 CZ 7				
	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structure)	0.60 0.27 ctural) Windows b	0.60 0.27 ased on 2	0.35 0.30 012 IECC	0.40	0.40	0.40		CZ 8			
	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structure) Climate Zone:	0.60 0.27 etural) Windows b CZ 1	0.60 0.27 ased on 2 CZ 2	0.35 0.30 012 IECC CZ 3	0.40 CZ 4	0.40 CZ 4 C & 5	0.40 CZ 6	CZ 7	CZ 8 0.29			
	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structure Climate Zone: Fixed Window U-Factor	0.60 0.27 ctural) Windows b CZ 1 0.50	0.60 0.27 ased on 2 CZ 2 0.50	0.35 0.30 012 IECC CZ 3 0.46	0.40 CZ 4 0.38	0.40 CZ 4 C & 5 0.38	0.40 CZ 6 0.36	CZ 7 0.29	CZ 8 0.29			
:kylights:	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structure Climate Zone: Fixed Window U-Factor Operable Window U-Factor	0.60 0.27 ctural) Windows b CZ 1 0.50 0.65	0.60 0.27 ased on 2 CZ 2 0.50 0.65	0.35 0.30 012 IECC CZ 3 0.46 0.60	0.40 CZ 4 0.38 0.45	0.40 CZ 4 C & 5 0.38 0.45	0.40 CZ 6 0.36 0.43	CZ 7 0.29 0.37	CZ 8 0.29 0.37			
, ,	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None	0.60 0.27 ctural) Windows b CZ 1 0.50 0.65	0.60 0.27 ased on 2 CZ 2 0.50 0.65	0.35 0.30 012 IECC CZ 3 0.46 0.60	0.40 CZ 4 0.38 0.45	0.40 CZ 4 C & 5 0.38 0.45	0.40 CZ 6 0.36 0.43	CZ 7 0.29 0.37	CZ 8 0.29 0.37			
, ,	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struction of the Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame	0.60 0.27 ctural) Windows b CZ 1 0.50 0.65	0.60 0.27 ased on 2 CZ 2 0.50 0.65	0.35 0.30 012 IECC CZ 3 0.46 0.60	0.40 CZ 4 0.38 0.45	0.40 CZ 4 C & 5 0.38 0.45	0.40 CZ 6 0.36 0.43	CZ 7 0.29 0.37	CZ 8 0.29 0.37			
, ,	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ²	0.60 0.27 ctural) Windows b CZ 1 0.50 0.65	0.60 0.27 ased on 2 CZ 2 0.50 0.65	0.35 0.30 012 IECC CZ 3 0.46 0.60	0.40 CZ 4 0.38 0.45	0.40 CZ 4 C & 5 0.38 0.45	0.40 CZ 6 0.36 0.43	CZ 7 0.29 0.37	CZ 8 0.29 0.37			
, ,	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³	0.60 0.27 etural) Windows b CZ 1 0.50 0.65 0.27	0.60 0.27 ased on 2 CZ 2 0.50 0.65 0.27	0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30	0.40 CZ 4 0.38 0.45 0.40	0.40 CZ 4 C & 5 0.38 0.45 0.40	0.40 CZ 6 0.36 0.43 0.40	CZ 7 0.29 0.37 0.40	CZ 8 0.29 0.37 0.40			
Skylights: Ceilings:	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³ Climate Zone:	0.60 0.27 ctural) Windows b CZ 1 0.50 0.65 0.27	0.60 0.27 ased on 2 CZ 2 0.50 0.65 0.27	0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30	0.40 CZ 4 0.38 0.45 0.40	0.40 CZ 4 C & 5 0.38 0.45 0.40	0.40 CZ 6 0.36 0.43 0.40	CZ 7 0.29 0.37 0.40	CZ 8 0.29 0.37 0.40			
Ceilings:	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³ Climate Zone: Ceiling Assembly U-Factor:	0.60 0.27 etural) Windows b CZ 1 0.50 0.65 0.27	0.60 0.27 ased on 2 CZ 2 0.50 0.65 0.27	0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027	0.40 CZ 4 0.38 0.45 0.40	0.40 CZ 4 C & 5 0.38 0.45 0.40	0.40 CZ 6 0.36 0.43 0.40	CZ 7 0.29 0.37 0.40	CZ 8 0.29 0.37 0.40			
, ,	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³ Climate Zone: Ceiling Assembly U-Factor: Construction Type: Vented with aperture	0.60 0.27 ctural) Windows b CZ 1 0.50 0.65 0.27 CZ 1 0.027 = 1sq. ft. per 300	0.60 0.27 ased on 2 CZ 2 0.50 0.65 0.27 CZ 2 0.027 sq. ft. ceili	0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027 ng area	0.40 CZ 4 0.38 0.45 0.40 CZ 4 0.027	0.40 CZ 4 C & 5 0.38 0.45 0.40 CZ 4 C & 5 0.027	0.40 CZ 6 0.36 0.43 0.40	CZ 7 0.29 0.37 0.40	CZ 8 0.29 0.37			
Ceilings:	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³ Climate Zone: Ceiling Assembly U-Factor: Construction Type: Vented with aperture Radiant Barrier: In climate zones 1-3, if >	0.60 0.27 ctural) Windows b CZ 1 0.50 0.65 0.27 CZ 1 0.027 = 1sq. ft. per 300 10 linear ft. of duc	0.60 0.27 ased on 2 CZ 2 0.50 0.65 0.27 CZ 2 0.027 sq. ft. ceillictwork are	0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027 ng area	0.40 CZ 4 0.38 0.45 0.40 CZ 4 0.027	0.40 CZ 4 C & 5 0.38 0.45 0.40 CZ 4 C & 5 0.027	0.40 CZ 6 0.36 0.43 0.40	CZ 7 0.29 0.37 0.40	CZ 8 0.29 0.37 0.40			
Ceilings:	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³ Climate Zone: Ceiling Assembly U-Factor: Construction Type: Vented with aperture Radiant Barrier: In climate zones 1-3, if > Construction Type: Composition shingle of	0.60 0.27 ctural) Windows b CZ 1 0.50 0.65 0.27 CZ 1 0.027 = 1sq. ft. per 300 10 linear ft. of duc	0.60 0.27 ased on 2 CZ 2 0.50 0.65 0.27 CZ 2 0.027 sq. ft. ceillictwork are	0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027 ng area	0.40 CZ 4 0.38 0.45 0.40 CZ 4 0.027	0.40 CZ 4 C & 5 0.38 0.45 0.40 CZ 4 C & 5 0.027	0.40 CZ 6 0.36 0.43 0.40	CZ 7 0.29 0.37 0.40	CZ 8 0.29 0.37 0.40			
ceilings:	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³ Climate Zone: Ceiling Assembly U-Factor: Construction Type: Vented with aperture Radiant Barrier: In climate zones 1-3, if > Construction Type: Composition shingle of Gross Area: Same as Rated Unit ²	0.60 0.27 ctural) Windows b CZ 1 0.50 0.65 0.27 CZ 1 0.027 = 1sq. ft. per 300 10 linear ft. of duc	0.60 0.27 ased on 2 CZ 2 0.50 0.65 0.27 CZ 2 0.027 sq. ft. ceillictwork are	0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027 ng area	0.40 CZ 4 0.38 0.45 0.40 CZ 4 0.027	0.40 CZ 4 C & 5 0.38 0.45 0.40 CZ 4 C & 5 0.027	0.40 CZ 6 0.36 0.43 0.40	CZ 7 0.29 0.37 0.40	CZ 8 0.29 0.37 0.40			
eilings:	U-Value: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³ Climate Zone: Ceiling Assembly U-Factor: Construction Type: Vented with aperture Radiant Barrier: In climate zones 1-3, if > Construction Type: Composition shingle of	0.60 0.27 ctural) Windows b CZ 1 0.50 0.65 0.27 CZ 1 0.027 = 1sq. ft. per 300 10 linear ft. of duc	0.60 0.27 ased on 2 CZ 2 0.50 0.65 0.27 CZ 2 0.027 sq. ft. ceillictwork are	0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027 ng area	0.40 CZ 4 0.38 0.45 0.40 CZ 4 0.027	0.40 CZ 4 C & 5 0.38 0.45 0.40 CZ 4 C & 5 0.027	0.40 CZ 6 0.36 0.43 0.40	CZ 7 0.29 0.37 0.40	CZ 0.29 0.3 0.40			



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Systems:	Heating capacity shall be selected in accordance with ACCA Manual S based on building heating and cooling loads calculated for the Reference Design in accordance with ACCA Manual J, Eighth Edition, ASHRAE Handbook of Fundamentals, or an equivalent computation									
Cystoms.	procedure									
	Fuel Type: Same as Rated Unit 2, 86									
	System Type: Same as Rated Unit 2, ex	cept Reference	e Desian sh	nall be config	ured with air-s	ource heat pun	np in CZ 1-6 w	here Rated	Unit is	
	modeled with <u>air-source or ground-source</u>									
	with ground-source heat pump in CZ 7 &									
	electric baseboard heat; applicable effici									
	Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4C & 5	CZ 6	CZ 7	CZ 8	
	Gas Furn. AFUE:	80	80	80	90	90	90	90	90	
	Oil Furn. AFUE:	80	80	80	85	85	85	85	85	
	Gas Boiler AFUE:	80	80	80	85	85	85	85	85	
	Oil Boiler AFUE:	80	80	80	85	85	85	85	85	
	Air-Source Heat Pump HSPF:	8.2	8.2	8.2	8.5	9.25	9.5	n/a	n/a	
	Air-Source Heat Pump Backup:	Electric	Electric	Electric	Electric	Electric	Electric	n/a	n/a	
		n/a	n/a	n/a	n/a	n/a	n/a	3.5	3.5	
	Ground-Source Heat Pump COP:									
	For non-electric warm furnaces and non for the Energy Rating Reference Home	-electric bolle	rs, the Elect	ric Auxiliary E	nergy snall b	e determined in	accordance v	vith the me	inodology	
Caalina								lated for th		
Cooling	Cooling capacity shall be selected in acc Reference Design in accordance with A									
Systems:	procedure	JCA Manual C	J, Eignin Ea	IIIOII, ASHKA	E Handbook	oi Fundamentai	s, or an equiva	alent comp	utation	
	Fuel Type: Same as Rated Unit ^{2, 68}									
	System Type: Same as Rated Unit ² , ex	D-f	- Design als				:- O7 4 C ···	hana Dataa	l I lait ia	
	modeled with <u>air-source or ground-source</u>									
	with ground-source heat pump in CZ 7 8									
	electric baseboard heat; applicable effici				iii-source or g	iodila-source ii	leat pullip <u>, ele</u>	CITIC SITIP IT	eat, or	
	Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8	
	AC SEER:	_	_					13		
		14.5	14.5	14.5	13	13	13		13	
	Air-Source Heat Pump SEER:	14.5	14.5	14.5	14.5	14.5	14.5	n/a	n/a	
	Ground-Source Heat Pump EER:	n/a	n/a	n/a	n/a	n/a	n/a	16.1	16.1	
Vater leating	Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Ra	the Lighting,	Appliances	, Fixtures, & I	nternal Gains	Section 7,119				
Water Heating	resulting from the equipment specified in Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 96}	the Lighting, ting Referenc	Appliances e Home, as	, Fixtures, & I defined by A	nternal Gains NSI / RESNE	Section 7,119 T / ICC Std. 30	1 7			
Water Heating	resulting from the equipment specified in Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 86} System Type: Conventional storage wat	the Lighting, ting Reference	Appliances e Home, as tank size e	, Fixtures, & I defined by A qual to that o	nternal Gains NSI / RESNE	T / ICC Std. 30	1 ⁷ nit uses instan	itaneous wa	ater heate	
Water Heating	resulting from the equipment specified in Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2, 96 System Type: Conventional storage wat in which case select 50 gallon tank for g	the Lighting, ting Reference	Appliances e Home, as tank size e	, Fixtures, & I defined by A qual to that o	nternal Gains NSI / RESNE	T / ICC Std. 30	1 ⁷ nit uses instan	itaneous wa	ater heate	
Water Heating	resulting from the equipment specified in Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2, 86 System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign	the Lighting, ting Reference	Appliances e Home, as tank size e	, Fixtures, & l defined by A qual to that o tank for elec	nternal Gains NSI / RESNE	T / ICC Std. 30	nit uses instan	itaneous wa	ater heate	
Water Heating	resulting from the equipment specified in Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2, 86 System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity:	the Lighting, ting Reference	Appliances e Home, as tank size e	, Fixtures, & I defined by A defined by A qual to that o tank for election ≤ 55 Gal	nternal Gains NSI / RESNE	T / ICC Std. 30	nit uses instan le efficiency fro	itaneous wa	ater heate	
Water Heating	resulting from the equipment specified in Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 86} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity: Gas DHW EF:	the Lighting, ting Reference	Appliances e Home, as tank size e	, Fixtures, & l defined by A qual to that o tank for election ≤ 55 Gal 0.67 EF	nternal Gains NSI / RESNE	T / ICC Std. 30	nit uses instan le efficiency fro > 55 Gal 0.77 EF	ntaneous wa	ater heate	
Service Water Heating Systems:	resulting from the equipment specified in Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2, 96 System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference Unit Design Gas Storage Tank Capacity: Electric Storage Tank Capacity:	the Lighting, ting Reference	Appliances e Home, as tank size e	qual to that o tank for elections 55 Gal 0.67 EF ≤ 55 Gal	nternal Gains NSI / RESNE	T / ICC Std. 30	nit uses instan le efficiency fro > 55 Gal 0.77 EF > 55 Gal	ntaneous wa	ater heate	
Water Heating	resulting from the equipment specified ir Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 86} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF:	n the Lighting, ting Reference er heater with as systems ar	Appliances e Home, as tank size end 60 gallon	qual to that o tank for election 55 Gal 0.67 EF ≤ 55 Gal 0.95 EF	nternal Gains NSI / RESNE f Rated Unit, tric systems.	T / ICC Std. 30 unless Rated U Select applicab	nit uses instan le efficiency fro > 55 Gal 0.77 EF > 55 Gal 2.00 EF	ntaneous wa	ater heate sing tank	
Nater Heating	resulting from the equipment specified in Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 96} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF: Oil Storage Tank Capacity: ¹⁹²	n the Lighting, ting Reference er heater with as systems ar	Appliances e Home, as tank size end 60 gallon	qual to that o tank for election of EF ≤ 55 Gal 0.67 EF ≤ 55 Gal 0.95 EF 40 Gallon	nternal Gains NSI / RESNE f Rated Unit, tric systems.	T / ICC Std. 30 unless Rated U Select applicab	nit uses instan le efficiency fro > 55 Gal 0.77 EF > 55 Gal 2.00 EF 70 Gallor	ntaneous water was a second of the second of	ater heater sing tank	
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Water Heating Systems:	resulting from the equipment specified in Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 86} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF: Oil Storage Tank Capacity: ¹⁹² Oil DHW EF: Duct Leakage to Outside: The greater of	er heater with as systems ar	Appliances e Home, as tank size end 60 gallon 0 Gallon 0.64	qual to that of tank for elections and tank for elections 55 Gal 0.67 EF ≤ 55 Gal 0.95 EF 40 Gallon 0.62	nternal Gains NSI / RESNE f Rated Unit, tric systems. 50 Gallon 0.60	T / ICC Std. 30 unless Rated U Select applicab 60 Gallon 0.58	nit uses instan le efficiency fro > 55 Gal 0.77 EF > 55 Gal 2.00 EF 70 Gallor	ntaneous water was a second of the second of	ater heater sing tank	
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National ERI Target Procedure (ANSI 301-2014) ENERGY STAR Multifamily New Construction, Version 1 (Rev. 01).

	ne:	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 10/1518/20182019



ENERGY STAR Multifamily New Construction, Version 1 (Rev. 01).

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

Lighting, Appliances, Fixtures & Internal Gains:	Lighting: Fraction of qualifying Tier I fixtures to all fixtures in qualifying light fixture locations 90% for interior; 0% for exterior and garage								
	Refrigerator: 423 kWh per year								
	Dishwasher: 0.66 EF, Place Setting Capacity Same as Rated Unit ² ; use 12 settings if no dishwasher installed in Rated Unit Clothes Washer: Use the ENERGY STAR values below, even if no clothes washer is installed. Exception: If installed clothes washer is not								
	available as ENERGY STAR certified (e.g., top-loading commercial clothes washers, Combination All-In One Washer-Dryers), model the same as the Rated Unit clothes washer								
		LER	\$/kWh	AGC	\$/therm	CAPw	IMEF		
	ENERGY STAR	152	0.12	12	1.09	4.2	2.06		
	Clothes Dryer: Field Use Factor is 1.04 and CEF is 3.93 for electric and 3.43 for gas, even if no clothes dryer is installed. Exception: If installed clothes dryer is not available as ENERGY STAR certified (e.g., commercial clothes dryers, Combination All-In One Washer-Dryers), model the same as the Rated Unit clothes dryer								
	Ceiling Fan: 122 CFM per Watt; Quantity = Number of bedrooms + 1 when ceiling fans present in the Rated Unit; otherwise Quantity = 0								
	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, clothes dryer, and ceiling fans specified in this section ⁷								
Internal	Same as Energy Rating Reference Home, as defined by ANSI / RESNET / ICC Std. 301 ⁷								
Mass:	Additional mass spe	cifically designed as	a Thermal Storage E	lement for the Rate	d Unit shall be exclude	ed	·		



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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. Where the envelope component is adiabatic in the Rated Unit, it shall also be adiabatic in the Multifamily 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. All Reference Design window and door U-factor and SHGC requirements for non-structural windows are based on the ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights Version 5.0 as outlined at energystar.gov/windows, except that SHGC values have been assumed for CZ 4C & 5-8. Note that the U-factor requirement applies to all fenestration while the SHGC only applies to the glazed portion.
- 6.5. 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.

7. The version of ANSI / RESNET / ICC Std. 301 utilized by RESNET for HERS ratings shall be used to configure this parameter.

- 8-6. 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.
- 9.7. 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 Multifamily Reference Design shall be configured with a 7.7 HSPF air-source heat pump.
- 40-8. For a Rated Unit without a cooling system, the ENERGY STAR Multifamily Reference Design shall be configured with a 13 SEER electric air conditioner.
- 41.9. That is to say, representative of standard-flow plumbing fixtures, reference clothes washer 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.
- 12.10. To determine domestic hot water (DHW) EF requirements for additional tank sizes, use the following equation: Oil DHW EF ≥ 0.70 (0.002 x Tank Gallon Capacity).
- 13.11. For a Rated Unit with conditioned space below, that does not indirectly use corridor air as the ventilation supply air, the ENERGY STAR Multifamily Reference Design shall be configured with an infiltration rate of 0.255 cfm50/ft². In accordance with the RESNET Guidelines for Multifamily Energy Ratings, for a Rated Unit with conditioned space below, and software shall either automatically apply a 15% reduction to the compartmentalization results of the Rated Unit or instruct the Rater to apply the reduction. If automatically applied, the software shall make that known, such that the Rater does not also apply the same reduction, which is based on the RESNET Guidelines for Multifamily Energy Ratings. The 15% reduction shall not be applied if the Rated Unit is located in a building where outdoor air for the Rated Unit is supplied to the corridor and is not directly ducted either into the Rated Unit or into the Rated Unit's HVAC system.