

APPENDIX P

EFFECTIVE USEFUL LIFE (EUL)**SINGLE AND MULTI-FAMILY RESIDENTIAL MEASURES**

Category	Single and Multi-family Residential Measures	Sector	EUL (years)	Source
Appliance	Air Purifier	Residential	9	ENERGY STAR® Calc ⁵³
	Clothes Dryer	Residential	14	ENERGY STAR® M&I Scoping Report ⁵⁴
	Clothes Washer	Residential	11	DEER 2014 EUL ID: Appl-EffCW
	Dehumidifier	Residential	12	ENERGY STAR® Calc ⁵⁵
	Dishwasher	Residential	11	DEER 2014 EUL ID: Appl-EffDW
	Fireplace	Residential	15	DOE ⁵⁶
	Refrigerator and Freezer	Residential	14	DEER 2014 EUL ID: Appl-ESRefg
	Soundbar	Residential	7	RPP Product Analysis ⁵⁷
Appliance Control	Advanced Power Strip (APS)	Residential	8	DEER 2014 EUL ID: Plug-OccSens
Appliance Recycling	Air Conditioner - Room (RAC) Recycling	Residential	3	DEER 2014 EUL ID: HV-RAC-RUL
	Refrigerator Recycling	Residential	5	DEER 2014 EUL ID: Appl-RecRef
	Freezer Recycling	Residential	4	DEER 2014 EUL ID: Appl-RecFrzr

⁵³ Savings Calculator for ENERGY STAR® Qualified Appliances (last updated October 2016)
Available from: <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/purchase-energy-saving-products>

⁵⁴ ENERGY STAR® Market & Industry Scoping Report: Residential Clothes Dryer, November 2011.

⁵⁵ ENERGY STAR® Dehumidifier Calculator
https://www.energystar.gov/sites/default/files/asset/document/appliance_calculator.xlsx

⁵⁶ Technical Support Document: Energy Conservation Program for Consumer Products: Energy Conservation Standards for Hearth Products. Chapters 7 and 8. Department of Energy (DOE). January 30, 2015, pg 2-12
<https://www.regulations.gov/document?D=EERE-2014-BT-STD-0036-0002>

⁵⁷ Retail Products Platform Product Analysis, Last Updated May 25, 2016.
Available from: <https://drive.google.com/file/d/0B9Fd3ckbKJp5OEpWSHg1eksyZ1U/view>

Appendix P: Effective Useful Life (EUL)

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Building Shell	Air Conditioner – Room (RAC) Cover and Gap Sealer	Residential	5	See note below ⁵⁸
	Air Leakage Sealing	Residential	15	GDS ⁵⁹
	Insulation – Hot Water and Steam Pipe	Residential	15	GDS ⁶⁰
	Insulation – Opaque Shell	Residential	25	GDS ⁶¹
	Storm Window	Residential	20	DOE ⁶²
	Window	Residential	20	DEER 2014 EUL ID: BS-Win
Domestic Hot Water	Heat Pump Water Heater (HPWH)	Residential	10	DEER 2014 EUL ID: WtrHt-HtPmp
	Indirect Water Heater	Residential	11	DEER 2014 EUL ID: WtrHt-Res-Gas
	Storage Water Heater - Gas	Residential	15	PA Consulting Group ⁶³
	Storage Water Heater - Electric	Residential	13	DEER 2014 EUL ID: WtrHt-Res-Elec
	Instantaneous Water Heater	Residential	20	DEER 2014 EUL ID: WtrHt-Instant-Res
Domestic Hot Water - Control	Drain Water Heat Recovery	Residential	30	2019 Title 24 ⁶⁴
	Low-Flow – Faucet Aerator	Residential	10	DEER 2014 EUL ID: WtrHt-WH-Aertr
	Low-Flow – Showerhead	Residential	10	DEER 2014 EUL ID: WtrHt-WH-Shrhd
	Thermostatic Shower Restriction Valve	Residential	10	UPC ⁶⁵

⁵⁸ At least one manufacturer’s warranty period. www.gss-ec.com/products.html

⁵⁹ GDS Associates, Inc., Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures, June 2007, Table 1 – Residential Measures

⁶⁰ Ibid.

⁶¹ Ibid.

⁶² https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-22864rev2.pdf

⁶³ PA Consulting Group Inc., Focus on Energy Evaluation Business Programs: Measure Life Study, final report dated August 25, 2009. Available from:

https://focusonenergy.com/sites/default/files/bpmeasurelifestudyfinal_evaluationreport.pdf

⁶⁴ 2019 Title 24, Part 6 CASE Report. “Drain Water Heat Recovery – Final Report.” Available from:

http://title24stakeholders.com/wp-content/uploads/2017/09/2019-T24-CASE-Report_DWHR_Final_September-2017.pdf

⁶⁵ UPC certification under the International Association of Plumbing and Mechanical Officials standard IGC 244-2007a. A standard that includes a lifecycle test consisting of 10,000 cycles without fail. 10,000 cycles is the equivalent of three users showering daily for more than nine years.

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Heating, Ventilation and Air Conditioning (HVAC)	Air Conditioner – Central (CAC)	Residential	15	DEER 2014 EUL ID: HV-ResAC
	Air Conditioner – Room (RAC)	Residential	12	GDS ⁶⁶
	Air Conditioner – PTAC	Residential	15	DEER 2014 EUL ID: HVAC-PTAC
	Boiler, Hot Water – Steel Water Tube	Residential	24	ASHRAE Handbook, 2015
	Boiler, Hot Water – Steel Fire Tube	Residential	25	ASHRAE Handbook, 2015
	Boiler, Hot Water – Cast Iron	Residential	35	ASHRAE Handbook, 2015
	Boiler, Steam – Steel Water Tube	Residential	30	ASHRAE Handbook, 2015
	Boiler, Steam – Steel Fire Tube	Residential	25	ASHRAE Handbook, 2015
	Boiler, Steam – Cast Iron	Residential	30	ASHRAE Handbook, 2015
	Boiler and Furnace - Combination (“Combi”) Boiler	Residential	22	DOE ⁶⁷
	Boiler and Furnace - Combination (“Combi”) Furnace	Residential	20	DEER ⁶⁸
	Duct Sealing and Insulation	Residential	18	DEER 2014 EUL ID: HV-DuctSeal
	Electronically Commutated (EC) Motor – HVAC Blower Fan	Residential	15	DEER 2014 EUL ID: Motors-fan
	Electronically Commutated (EC) Motor – Hydronic Circulator Pump	Residential	15	DEER 2014 EUL ID: Motors-pump
	Furnace, Gas Fired	Residential	22	DOE ^{69,70}
Heat Pump - Air Source (ASHP)	Residential	15	DEER 2014 EUL ID: HV-Res HP	

⁶⁶ GDS Associates, Inc., Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures, June 2007, Table 1 – Residential Measures

⁶⁷ Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment: Residential Furnaces, February 10, 2015, Table 8.2.17. Product definition of furnaces includes electric boilers with firing rates of less than 300,000 BTU/h

Available from: https://energy.mo.gov/sites/energy/files/technical-support-document---residential-furnaces_doe.pdf

⁶⁸ Based on DEER value for high efficiency boiler and instantaneous water heater

⁶⁹ U.S. DOE. “Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment: Residential Furnaces” and “Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment: Commercial Warm Air Furnaces.” August 30, 2016. Available from: <https://www.regulations.gov/document?D=EERE-2014-BT-STD-0031-0217>

⁷⁰ U.S. DOE. “Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment: Commercial Warm Air Furnaces.” December 30, 2015. Available from: <https://www.regulations.gov/document?D=EERE-2013-BT-STD-0021-0050>

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Heating, Ventilation and Air Conditioning (HVAC)	Heat Pump – Ground Source (GSHP)	Residential	25	ASHRAE ⁷¹
	Heat Pump – PTHP	Residential	15	DEER 2014 EUL ID: HVAC-PTHP
	Refrigerant Charge Correction & Tune-Up – Air Conditioner and Heat Pump	Residential	10	DEER 2014 EUL ID: HV-RefChrg
	Tune-Up - Boiler	Residential	5	DEER 2014 EUL ID: BlrTuneup
	Tune-Up - Furnace	Residential	5	DEER 2014 EUL ID: BlrTuneup
	Unit Heater, Gas Fired	Residential	13	ASHRAE Handbook, 2015
HVAC - Control	Outdoor Temperature Setback Control for Hydronic Boiler	Residential	EUL = RUL of Existing Boiler = Boiler EUL – (Current Year – Year of Mfr.)	N/A
	Steam Trap – Low Pressure Space Heating	Residential	6	DEER 2014 EUL ID: HVAC-StmTrp
	Submetering	Multifamily	10	NYSERDA ⁷²
	Thermostat – Programmable Setback Thermostat – Wi-Fi (Communicating) Thermostat – Learning	Residential	11	DEER 2014 EUL ID: HVAC-ProgTStats
	Thermostatic Radiator Valve – One Pipe Steam Radiator	Multifamily	15	DOE ⁷³
	Smart Thermostatic Radiator Enclosure	Residential	15	DEER 2014 EUL ID: Motors-fan ⁷⁴

⁷¹ ASHRAE: Owning and Operating Cost Database, Equipment Life/Maintenance Cost Survey: https://xp20.ashrae.org/publicdatabase/system_service_life.asp?selected_system_type=1

⁷² NYSERDA Residential Electric Submetering Manual

⁷³ U.S. DOE, “Thermostatic Radiator Valve Evaluation”, January 2015, Table 4. Cost-Benefit Financial Assumptions, pg. 16

⁷⁴ Based on assumed EUL of integrated fan, which is expected to be the first component to fail

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Lighting	LED Lamp	Residential	Rated Life listed by ENERGY STAR® or default to 15,000 hrs/ annual lighting operating hrs or 15 yrs if rated lifetime or annual operating hours are not known	ENERGY STAR® Lamps ⁷⁵
			50,000 hours	DLC ⁷⁶

⁷⁵ ENERGY STAR® Program Requirements Product Specification for Lamps (Light Bulbs) V2.1, June 2017, p. 19 (Capped at 20 years).
<https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Lamps%20V2.1%20Final%20Specification.pdf>

⁷⁶ Placed on the Qualified Products List by the Design Light Consortium (DLC) 50,000 hours, according to the appropriate Application Category as specified in the DLC’s Product Qualification Criteria, Technical Requirement Table version 4.4 or higher

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Lighting	Light Fixture	LED (Interior)	Residential	Rated Life listed by ENERGY STAR or default to 25,000 hrs/ annual lighting operating hrs or 15 yrs if rated lifetime or annual operating hours are not known	ENERGY STAR® Fixtures ⁷⁷
		LED (Exterior)	Residential	Rated Life listed by ENERGY STAR or default to 35,000 hrs/ annual lighting operating hrs or 15 yrs if rated lifetime or annual operating hours are not known	ENERGY STAR® Fixtures
		LED (Inseparable)	Residential	Rated Life listed by ENERGY STAR or default to 50,000 hrs/ annual lighting operating hrs or 15 yrs if rated lifetime or annual operating hours are not known	ENERGY STAR® Fixtures
Lighting Control	Bi-Level Lighting		Multifamily Common Area	15	ComEd ⁷⁸

⁷⁷ ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) V2.2, August 2019, p. 18 (Capped at 20 years).

<https://www.energystar.gov/sites/default/files/Luminaires%20V2.2%20Final%20Specification.pdf>

⁷⁸ ComEd Luminaire Level Lighting Control IPA Program Impact Evaluation Report prepared by Navigant Available from:

http://ilsagfiles.org/SAG_files/Evaluation_Documents/ComEd/ComEd_EPY9_Evaluation_Reports_Final/ComEd_P_Y9_LLLC_IPA_Program_Impact_Evaluation_Report_2018-06-05_Final.pdf

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Motors and Drives	Pool Pump	Residential	10	DEER 2014 EUL ID: OutD- PoolPump
Other	Pool Heater	Residential	8	DOE ⁷⁹

⁷⁹ DOE, Chapter 8, Life-Cycle Cost and Payback Period Analyses, Table 8.75 Available from: <https://www.regulations.gov/document?D=EERE-2006-STD-0129-0170>