_____Advisory Public Review Draft

Proposed Addendum cs to Standard 90.1-2022, Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings

**Advisory Public Review (April 2025)
(Draft Shows Proposed Changes to Current Standard)**

This draft has been recommended for public review by the responsible project committee. To submit a comment on this proposed standard, go to the ASHRAE website at www.ashrae.org/standards-research--technology/public-review-drafts and access the online comment database. The draft is subject to modification until it is approved for publication by the Board of Directors and ANSI. Until this time, the current edition of the standard (as modified by any published addenda on the ASHRAE website) remains in effect. The current edition of any standard may be purchased from the ASHRAE Online Store at www.ashrae.org/bookstore or by calling 404-636-8400 or 1-800-727-4723 (for orders in the U.S. or Canada).

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(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

Appendix G Performance Rating Method utilizes Building Performance Factors (BPFs) to establish compliance. BPFs represent the improvement in regulated energy use between a current edition of the standard and the Appendix G baseline (approximately equal to 90.1-2004). In order for a project to comply, the regulated energy use of the *proposed design* must not exceed the regulated energy use of the *baseline design* multiplied by the applicable BPF. Since BPFs are derived from prototype building models, projects with energy end uses that deviate significantly from the prototype may face challenges in meeting the target, even if the building is energy efficient. Developing performance factors for each individual end use, rather than a single BPF for all regulated loads combined, helps normalize for the difference in end use allocation in the prototype model compared to a particular project and establish a fairer compliance target.

For example, if a BPF value is heavily influenced by heating energy savings where heating energy reduced by ~75% between 2004 and 2025 while other end uses improved by a significantly lower margin, a proposed building design where heating accounts for smaller percentage of the overall energy use due to high internal gains may struggle to achieve the magnitude of overall energy savings needed for compliance. With the proposed end-use-specific BPF approach, the 75% reduction would apply only to the small heating energy load, minimizing its impact on the compliance target. This proposal introduces an informative Appendix, allowing projects to utilize end-use-specific performance factors (EUPFs) when approved by the jurisdiction in lieu of single building-level BPFs.

The Appendix includes changes to Sections 3, 4 and Appendix G for using the EUPFs in conjunction with energy cost, site energy, source energy and carbon emissions metrics in lieu of BPFs. It also provides an example of how a jurisdiction would amend ASHRAE 90.1 language to adopt the EUPFs. The example shows the proper changes using strikeout and underline markups. Conversion factors used for different metrics are aligned with Tables I4-1 and I5-1 for carbon emissions, site energy, source energy and energy cost. EUPFs included in the Appendix are derived from the same prototype models as the BPFs.

The information included in this Appendix improves the usability of Appendix G by allowing jurisdictions greater flexibility in using the Appendix G.

This addendum impacts an optional performance path in the standard designed to provide increased flexibility and therefore was not subjected to cost effectiveness analysis.

(This appendix is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.

This entire appendix is new so is not shown as underlined.)

4.2 Compliance
4.2.1 Compliance Paths
4.2.1.1 New Buildings.
…………………….
Informative Notes:
1. PBP*nre* = *proposed building performance*, no renewable *energy*.
2. PBP*pre* = *proposed building performance*, prescriptive renewable *energy*.
3. PRE = prescriptive renewable *energy*.
4. See Informative Appendix I for using other metrics, including *site energy*, source *energy*, and carbon emissions, in conjunction with the Normative Appendix G *Performance Rating Method* when approved by the *rating authority*.
5. See Informative Appendix XX for using the End Use Performance Factors (EUPFs) instead of the BPFs in conjunction with the Normative Appendix G *Performance Rating Method* when approved by the *rating authority*.

G1.2.2 Performance Rating Calculation.
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Informative Notes:
1. Neither the *proposed building performance* nor the *baseline building performance* are predictions of actual *energy* consumption or costs for the *proposed design* after *construction*. Actual experience will differ from these calculations due to variations such as occupancy, *building* operation and maintenance, weather, *energy* use not covered by this procedure, changes in *energy* rates between design of the *building* and occupancy, and the precision of the calculation tool.
2. See Informative Appendix I for using other metrics, including site *energy*, source *energy*, and carbon emissions, in conjunction with the Normative Appendix G *Performance Rating Method* when approved by the *rating authority*.
3. See Informative Appendix XX for using the End Use Performance Factors (EUPFs) instead of the BPFs in conjunction with the Normative Appendix G *Performance Rating Method* when approved by the *rating authority*.

Insert entirely new informative appendix as follows (underlining not shown for clarity):

INFORMATIVE APPENDIX XX: USING END USE PERFORMANCE FACTORS IN CONJUNCTION WITH APPENDIX G PERFORMANCE RATING METHOD WHEN APPROVED BY THE RATING AUTHORITY

XX1. GENERAL
This informative Appendix describes changes to Section 3, Section 4, and Normative Appendix G for using End Use Performance Factors (EUPFs) in conjunction with energy cost, site energy, source energy and carbon emissions metrics instead of Building Performance Factors (BPFs) that may be adopted by the *rating authority* for the Normative Appendix G *Performance Rating Method*. It also includes an example of how a jurisdiction would amend ASHRAE 90.1 language to adopt the site energy EUPFs with the changes shown using strikeout and underline markups.

Informative Note:
BPFs in the Normative Appendix G are derived from prototype building models and reflect the minimum overall improvement in the regulated end uses in the proposed design relative to the baseline design that a project must meet to comply. Using performance factors for each individual end use as described in this Appendix, rather than a single BPF for all regulated end uses combined, helps normalize for the difference in end use allocation between the prototype models and a particular project, and establish a fairer compliance target. EUPFs included in this Appendix are derived from the same prototype buildings models as the BPFs in the Normative Appendix G. Conversion factors used for different metrics are aligned with Tables I4-1 and I5-1 for carbon emissions, site energy, source energy and energy cost.

XX2. CHANGES TO SECTION 3

Replace references to "annual energy cost" with the reference to the selected metric in the definitions of *baseline building performance* and *proposed building performance*.

XX3. CHANGES TO SECTION 4

a. Replace all references to "energy cost" in Section 4.2.1.1 with the selected metric such as "site energy," "source energy," or "carbon emissions," as appropriate, throughout.

b. Replace all references to "Performance Cost Index" in Section 4.2.1.1 with "Performance Index (Site Energy)," "Performance Index (Source Energy)," or "Performance Index (Carbon Emissions)," as appropriate throughout.

c. For energy cost, replace Table 4.2.1.1 with Table X1-1 to X1-9

X1-1 Office End Use Performance Factors (EUPF, Energy Cost)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.29
Exterior lighting	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.19
Space heating	0.78	0.77	0.71	0.94	0.57	0.81	0.97	1.18	0.66	0.67	0.82	0.86	0.68	0.80	0.95	0.69	0.75	0.58	0.62
Space cooling	0.63	0.65	0.62	0.64	0.53	0.64	0.49	0.63	0.51	0.46	0.60	0.51	0.54	0.59	0.47	0.55	0.53	0.50	0.50
Pumps	0.72	0.71	0.71	0.71	0.67	0.69	0.66	0.73	0.46	0.50	0.67	0.62	0.91	0.63	0.69	0.88	0.82	0.65	0.65
Heat rejection	0.89	0.94	0.90	0.94	0.76	0.94	0.75	0.96	0.83	0.66	0.89	0.71	0.77	0.83	0.61	0.76	0.72	0.70	0.61
Fans	0.55	0.55	0.54	0.53	0.52	0.52	0.45	0.52	0.51	0.49	0.46	0.49	0.48	0.44	0.51	0.44	0.42	0.46	0.49
Service water heating	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	1.03
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Other regulated	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91

X1-2 Retail End Use Performance Factors (EUPF, Energy Cost)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.38	0.38	0.39	0.39	0.37	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.40	0.40	0.40	0.40
Exterior lighting	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Space heating	0.85	0.85	0.85	0.85	0.48	1.14	0.66	1.40	1.23	0.60	1.06	0.98	0.63	1.00	1.04	0.61	0.67	0.63	0.63
Space cooling	0.56	0.55	0.52	0.54	0.41	0.48	0.35	0.45	0.32	0.36	0.43	0.37	0.41	0.40	0.29	0.43	0.41	0.38	0.38
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.26	0.25	0.24	0.26	0.24	0.26	0.27	0.25	0.33	0.29	0.32	0.34	0.34	0.31	0.35	0.26	0.30	0.30	0.33
Service water heating	1.08	1.07	1.07	1.07	1.07	1.07	0.40	0.44	0.38	0.40	0.44	0.40	0.42	0.44	0.39	0.43	0.45	0.45	0.49
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

X1-3 School End Use Performance Factors (EUPF, Energy Cost)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.22	0.22	0.21	0.21	0.21	0.22	0.21	0.22	0.22	0.22	0.22	0.22	0.21	0.22	0.22	0.22	0.21	0.21	0.23
Exterior lighting	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20
Space heating	0.74	0.73	1.27	0.90	1.18	1.52	1.38	0.91	0.80	0.28	0.66	0.67	0.35	0.61	0.55	0.36	0.37	0.37	0.45
Space cooling	0.54	0.62	0.54	0.62	0.51	0.71	0.50	0.69	0.59	0.45	0.68	0.68	0.62	0.72	0.79	0.61	0.65	0.66	0.73
Pumps	0.56	0.56	0.56	0.57	0.55	0.57	0.58	0.59	0.74	0.57	0.60	0.64	0.59	0.61	0.61	0.99	0.97	0.19	0.26
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.74	0.53	0.68	0.53	0.58	0.47	0.53	0.42	0.50	0.64	0.41	0.54	0.64	0.41	0.61	0.61	0.53	0.62	0.65
Service water heating	0.62	0.63	0.64	0.64	0.65	0.65	0.67	0.67	0.67	0.68	0.68	0.68	0.69	0.69	0.69	0.70	0.70	0.70	0.71
Commercial Refrigeration	0.78	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.78	0.77	0.78	0.77
Elevators	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Other regulated	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97

X1-4 Health Care / Hospital End Use Performance Factors (EUPF, Energy Cost)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.60	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.57	0.57	0.59	0.57	0.57	0.57	0.58
Exterior lighting	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Space heating	0.72	0.73	0.81	0.95	0.72	0.83	0.82	0.91	0.97	0.83	0.87	0.67	0.63	0.76	0.80	0.59	0.72	0.67	0.70
Space cooling	0.62	0.62	0.61	0.62	0.56	0.56	0.47	0.51	0.45	0.36	0.45	0.33	0.43	0.41	0.34	0.46	0.41	0.45	0.36
Pumps	0.84	0.85	0.90	0.87	0.75	0.69	0.66	1.09	1.32	0.88	0.99	1.11	1.59	1.03	0.89	1.60	1.11	1.35	0.84
Heat rejection	0.74	0.60	0.67	0.61	0.65	1.18	0.65	1.49	1.49	0.75	1.06	1.13	0.84	0.77	1.52	0.82	0.78	0.96	0.94
Fans	0.64	0.63	0.64	0.63	0.64	0.62	0.65	0.58	0.62	0.62	0.51	0.61	0.62	0.50	0.62	0.61	0.54	0.58	0.59
Service water heating	0.89	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Commercial Refrigeration	0.83	0.83	0.82	0.82	0.82	0.82	0.81	0.82	0.82	0.81	0.81	0.81	0.81	0.81	0.80	0.80	0.80	0.80	0.79
Elevators	0.56	0.43	0.56	0.43	0.56	0.43	0.43	0.43	0.43	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Other regulated	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99

X1-5 Restaurant End Use Performance Factors (EUPF, Energy Cost)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.31	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.32
Exterior lighting	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.22
Space heating	1.16	1.62	1.22	1.13	1.41	1.12	1.39	1.22	1.22	1.07	1.22	1.21	1.01	1.06	1.19	0.95	0.98	0.95	0.93
Space cooling	0.60	0.59	0.57	0.57	0.54	0.60	0.51	0.58	0.50	0.51	0.59	0.52	0.54	0.61	0.56	0.57	0.60	0.56	0.55
Pumps	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.50	0.44	0.47	0.43	0.45	0.40	0.45	0.41	0.42	0.45	0.42	0.44	0.45	0.43	0.45	0.43	0.41	0.42	0.42
Service water heating	1.20	1.20	1.18	1.18	1.16	1.16	1.13	1.14	1.13	1.11	1.12	1.11	1.10	1.10	1.10	1.09	1.09	1.08	1.06
Commercial Refrigeration	0.75	0.75	0.74	0.74	0.74	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

X1-6 Hotel/Motel End Use Performance Factors (EUPF, Energy Cost)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.31	0.31	0.31	0.31	0.30	0.31	0.30	0.31	0.32	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.30	0.31	0.31
Exterior lighting	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Space heating	0.45	0.30	0.46	0.36	0.54	0.61	0.65	0.48	0.54	0.37	0.50	0.45	0.32	0.42	0.44	0.35	0.42	0.42	0.47
Space cooling	0.62	0.60	0.62	0.60	0.58	0.56	0.54	0.63	0.62	0.57	0.56	0.53	0.60	0.55	0.49	0.63	0.59	0.58	0.54
Pumps	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.67	0.72	0.45	0.51	0.50	0.43	0.44	0.47	0.42	0.41	0.43	0.49
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.86	0.78	0.89	0.78	0.83	0.75	0.81	0.75	0.74	0.81	0.70	0.75	0.80	0.70	0.77	0.79	0.73	0.76	0.77
Service water heating	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.75	0.76
Commercial Refrigeration	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Elevators	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Other regulated	0.97	0.97	0.97	0.97	0.96	0.96	0.96	0.96	0.97	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96

X1-7 Warehouse End Use Performance Factors (EUPF, Energy Cost)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.14	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.15	0.19	0.19	0.19	0.20
Exterior lighting	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.28
Space heating	0.89	0.89	1.00	1.23	0.50	0.92	0.72	1.22	1.68	0.80	0.83	0.94	0.80	0.82	0.99	0.72	0.73	0.59	0.63
Space cooling	0.40	0.46	0.35	0.44	0.30	0.33	0.27	0.34	0.25	0.24	0.30	0.20	0.22	0.27	0.14	0.20	0.21	0.17	0.13
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.28	0.28	0.26	0.27	0.24	0.25	0.20	0.23	0.16	0.13	0.18	0.15	0.11	0.15	0.16	0.08	0.09	0.07	0.08
Service water heating	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

X1-8 Multifamily End Use Performance Factors (EUPF, Energy Cost)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Exterior lighting	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Space heating	0.53	0.66	0.31	0.74	0.32	0.44	0.77	0.63	1.07	0.44	0.42	0.43	0.44	0.39	0.31	0.51	0.47	0.52	0.63
Space cooling	0.58	0.54	0.60	0.56	0.62	0.65	0.65	0.70	0.41	0.74	0.81	1.01	0.86	0.91	1.50	0.85	0.96	0.84	1.18
Pumps	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.76	0.85	0.31	0.57	0.43	0.21	0.35	0.42	0.16	0.22	0.14	0.12
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.75	0.60	0.61	0.56	0.56	0.54	0.50	0.51	0.25	0.46	0.43	0.40	0.40	0.41	0.41	0.36	0.37	0.38	0.43
Service water heating	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Other regulated	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89

X1-9 All Other End Use Performance Factors (EUPF, Energy Cost)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.34	0.34	0.35	0.35	0.29	0.28	0.30	0.29	0.35	0.32	0.29	0.33	0.31	0.31	0.38	0.35	0.32	0.34	0.35
Exterior lighting	0.23	0.23	0.28	0.23	0.24	0.25	0.24	0.25	0.25	0.26	0.22	0.25	0.24	0.24	0.24	0.24	0.23	0.23	0.22
Space heating	0.95	0.88	0.61	0.88	0.60	0.85	0.84	0.99	1.06	0.57	0.75	0.67	0.56	0.64	0.65	0.51	0.52	0.51	0.59
Space cooling	0.58	0.59	0.56	0.59	0.47	0.50	0.46	0.53	0.46	0.50	0.53	0.67	0.53	0.58	0.63	0.58	0.57	0.54	0.51
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.59	0.52	0.52	0.51	0.46	0.40	0.43	0.39	0.39	0.42	0.37	0.41	0.40	0.36	0.52	0.41	0.44	0.47	0.50
Service water heating	0.91	0.88	0.84	0.88	0.87	0.89	0.80	0.82	0.80	0.81	0.77	0.81	0.80	0.81	0.70	0.78	0.75	0.74	0.80
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

d. For site energy, replace Table 4.2.1.1 with Tables X2-1 to X2-9.

Table X2-1 Office End Use Performance Factors (EUPF, Site Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.29
Exterior lighting	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.19
Space heating	0.71	0.71	0.71	0.87	0.57	0.81	0.97	1.13	0.53	0.55	0.75	0.75	0.58	0.72	0.85	0.62	0.66	0.50	0.55
Space cooling	0.63	0.65	0.62	0.64	0.53	0.64	0.49	0.63	0.51	0.46	0.60	0.51	0.54	0.59	0.47	0.55	0.53	0.50	0.50
Pumps	0.72	0.71	0.71	0.71	0.67	0.69	0.66	0.73	0.46	0.50	0.67	0.62	0.91	0.63	0.69	0.88	0.82	0.65	0.65
Heat rejection	0.89	0.94	0.90	0.94	0.76	0.94	0.75	0.96	0.83	0.66	0.89	0.71	0.77	0.83	0.61	0.76	0.72	0.70	0.61
Fans	0.55	0.55	0.54	0.53	0.52	0.52	0.45	0.52	0.51	0.49	0.46	0.49	0.48	0.44	0.51	0.44	0.42	0.46	0.49
Service water heating	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	1.03
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Other regulated	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91

Table X2-2 Retail End Use Performance Factors (EUPF, Site Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.38	0.38	0.39	0.39	0.37	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.40	0.40	0.40	0.40
Exterior lighting	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Space heating	0.90	0.90	0.90	0.90	0.48	1.14	0.66	1.45	1.28	0.60	1.74	0.98	0.63	1.00	1.04	0.61	0.67	0.63	0.63
Space cooling	0.56	0.55	0.52	0.54	0.41	0.48	0.35	0.45	0.32	0.36	0.43	0.37	0.41	0.40	0.29	0.43	0.41	0.38	0.38
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.26	0.25	0.24	0.26	0.24	0.26	0.27	0.25	0.33	0.29	0.32	0.34	0.34	0.31	0.35	0.26	0.30	0.30	0.33
Service water heating	1.08	1.07	1.07	1.07	1.07	1.07	0.40	0.44	0.38	0.40	0.44	0.40	0.42	0.44	0.39	0.43	0.45	0.45	0.49
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

Table X2-3 School End Use Performance Factors (EUPF, Site Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.22	0.22	0.21	0.21	0.21	0.22	0.21	0.22	0.22	0.22	0.22	0.22	0.21	0.22	0.22	0.22	0.21	0.21	0.23
Exterior lighting	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20
Space heating	0.74	0.73	1.27	0.90	1.18	1.52	1.38	0.91	0.80	0.28	0.66	0.67	0.35	0.61	0.55	0.36	0.37	0.37	0.45
Space cooling	0.54	0.62	0.54	0.62	0.51	0.71	0.50	0.69	0.59	0.45	0.68	0.68	0.62	0.72	0.79	0.61	0.65	0.66	0.73
Pumps	0.56	0.56	0.56	0.57	0.55	0.57	0.58	0.59	0.74	0.57	0.60	0.64	0.59	0.61	0.61	0.99	0.97	0.19	0.26
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.74	0.53	0.68	0.53	0.58	0.47	0.53	0.42	0.50	0.64	0.41	0.54	0.64	0.41	0.61	0.61	0.53	0.62	0.65
Service water heating	0.62	0.63	0.64	0.64	0.65	0.65	0.67	0.67	0.67	0.68	0.68	0.68	0.69	0.69	0.69	0.70	0.70	0.70	0.71
Commercial Refrigeration	0.78	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.78	0.77	0.78	0.77
Elevators	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Other regulated	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97

Table X2-4 Health Care / Hospital End Use Performance Factors (EUPF, Site Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.60	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.57	0.57	0.59	0.57	0.57	0.57	0.58
Exterior lighting	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Space heating	0.49	0.50	0.59	0.73	0.69	0.75	0.73	0.78	0.90	0.63	0.69	0.60	0.53	0.64	0.75	0.51	0.60	0.60	0.63
Space cooling	0.62	0.62	0.61	0.62	0.56	0.56	0.47	0.51	0.45	0.36	0.45	0.33	0.43	0.41	0.34	0.46	0.41	0.45	0.36
Pumps	0.84	0.85	0.90	0.87	0.75	0.69	0.66	1.09	1.32	0.88	0.99	1.11	1.59	1.03	0.89	1.60	1.11	1.35	0.84
Heat rejection	0.74	0.60	0.67	0.61	0.65	1.18	0.65	1.49	1.49	0.75	1.06	1.13	0.84	0.77	1.52	0.82	0.78	0.96	0.94
Fans	0.64	0.63	0.64	0.63	0.64	0.62	0.65	0.58	0.62	0.62	0.51	0.61	0.62	0.50	0.62	0.61	0.54	0.58	0.59
Service water heating	0.84	0.63	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Commercial Refrigeration	0.83	0.83	0.82	0.82	0.82	0.82	0.81	0.82	0.82	0.81	0.81	0.81	0.81	0.81	0.80	0.80	0.80	0.80	0.79
Elevators	0.56	0.43	0.56	0.43	0.56	0.43	0.43	0.43	0.43	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Other regulated	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99

Table X2-5 Restaurant End Use Performance Factors (EUPF, Site Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.31	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.32
Exterior lighting	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.22
Space heating	1.16	1.62	1.22	1.13	1.41	1.12	1.39	1.22	1.22	1.07	1.22	1.21	1.01	1.06	1.19	0.95	0.98	0.95	0.93
Space cooling	0.60	0.59	0.57	0.57	0.54	0.60	0.51	0.58	0.50	0.51	0.59	0.52	0.54	0.61	0.56	0.57	0.60	0.56	0.55
Pumps	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.50	0.44	0.47	0.43	0.45	0.40	0.45	0.41	0.42	0.45	0.42	0.44	0.45	0.43	0.45	0.43	0.41	0.42	0.42
Service water heating	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Commercial Refrigeration	0.75	0.75	0.74	0.74	0.74	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

Table X2-6 Hotel/Motel End Use Performance Factors (EUPF, Site Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.31	0.31	0.31	0.31	0.30	0.31	0.30	0.31	0.32	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.30	0.31	0.31
Exterior lighting	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Space heating	0.45	0.30	0.46	0.36	0.54	0.61	0.65	0.48	0.54	0.37	0.50	0.45	0.32	0.42	0.44	0.35	0.42	0.42	0.47
Space cooling	0.62	0.60	0.62	0.60	0.58	0.56	0.54	0.63	0.62	0.57	0.56	0.53	0.60	0.55	0.49	0.63	0.59	0.58	0.54
Pumps	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.67	0.72	0.45	0.51	0.50	0.43	0.44	0.47	0.42	0.41	0.43	0.49
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.86	0.78	0.89	0.78	0.83	0.75	0.81	0.75	0.74	0.81	0.70	0.75	0.80	0.70	0.77	0.79	0.73	0.76	0.77
Service water heating	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.75	0.76
Commercial Refrigeration	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Elevators	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Other regulated	0.97	0.97	0.97	0.97	0.96	0.96	0.96	0.96	0.97	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96

Table X2-7 Warehouse End Use Performance Factors (EUPF, Site Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.14	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.15	0.19	0.19	0.19	0.20
Exterior lighting	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.28
Space heating	0.89	0.89	1.00	1.23	0.50	0.92	0.72	1.22	1.68	0.80	0.83	0.94	0.80	0.82	0.99	0.72	0.73	0.59	0.63
Space cooling	0.40	0.46	0.35	0.44	0.30	0.33	0.27	0.34	0.25	0.24	0.30	0.20	0.22	0.27	0.14	0.20	0.21	0.17	0.13
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.28	0.28	0.26	0.27	0.24	0.25	0.20	0.23	0.16	0.13	0.18	0.15	0.11	0.15	0.16	0.20	0.09	0.20	0.20
Service water heating	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

Table X2-8 Multifamily End Use Performance Factors (EUPF, Site Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Exterior lighting	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Space heating	0.44	0.66	0.31	0.74	0.32	0.44	0.77	0.47	0.83	0.32	0.30	0.32	0.33	0.29	0.23	0.38	0.35	0.39	0.47
Space cooling	0.58	0.54	0.60	0.56	0.62	0.65	0.65	0.70	0.41	0.74	0.81	1.01	0.86	0.91	1.50	0.85	0.96	0.84	1.18
Pumps	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.76	0.85	0.31	0.57	0.43	0.21	0.35	0.42	0.16	0.22	0.14	0.12
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.75	0.60	0.61	0.56	0.56	0.54	0.50	0.51	0.25	0.46	0.43	0.40	0.40	0.41	0.41	0.36	0.37	0.38	0.43
Service water heating	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Other regulated	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89

X2-9 All Other End Use Performance Factors (EUPF, Site Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.34	0.34	0.35	0.35	0.29	0.28	0.30	0.29	0.35	0.32	0.29	0.33	0.31	0.31	0.38	0.35	0.32	0.34	0.35
Exterior lighting	0.23	0.23	0.28	0.23	0.24	0.25	0.24	0.25	0.25	0.26	0.22	0.25	0.24	0.24	0.24	0.24	0.23	0.23	0.22
Space heating	0.49	0.77	0.60	0.80	0.60	0.84	0.83	0.95	0.93	0.50	0.77	0.60	0.53	0.62	0.64	0.49	0.50	0.49	0.57
Space cooling	0.58	0.59	0.56	0.59	0.47	0.50	0.46	0.53	0.46	0.50	0.53	0.67	0.53	0.58	0.63	0.58	0.57	0.54	0.51
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.59	0.52	0.52	0.51	0.46	0.40	0.43	0.39	0.39	0.42	0.37	0.41	0.40	0.36	0.52	0.48	0.44	0.52	0.58
Service water heating	0.86	0.83	0.83	0.83	0.86	0.88	0.79	0.81	0.80	0.80	0.76	0.81	0.80	0.81	0.69	0.77	0.74	0.73	0.77
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

e. For carbon emissions, replace Table 4.2.1.1 with Tables X3-1 to X3-9.

X3-1 Office End Use Performance Factors (EUPF, Carbon Emissions)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.29
Exterior lighting	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.19
Space heating	0.78	0.77	0.71	0.94	0.57	0.81	0.97	1.18	0.66	0.67	0.82	0.86	0.68	0.80	0.95	0.69	0.75	0.58	0.62
Space cooling	0.63	0.65	0.62	0.64	0.53	0.64	0.49	0.63	0.51	0.46	0.60	0.51	0.54	0.59	0.47	0.55	0.53	0.50	0.50
Pumps	0.72	0.71	0.71	0.71	0.67	0.69	0.66	0.73	0.46	0.50	0.67	0.62	0.91	0.63	0.69	0.88	0.82	0.65	0.65
Heat rejection	0.89	0.94	0.90	0.94	0.76	0.94	0.75	0.96	0.83	0.66	0.89	0.71	0.77	0.83	0.61	0.76	0.72	0.70	0.61
Fans	0.55	0.55	0.54	0.53	0.52	0.52	0.45	0.52	0.51	0.49	0.46	0.49	0.48	0.44	0.51	0.44	0.42	0.46	0.49
Service water heating	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	1.03
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Other regulated	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91

X3-2 Retail End Use Performance Factors (EUPF, Carbon Emissions)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.38	0.38	0.39	0.39	0.37	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.40	0.40	0.40	0.40
Exterior lighting	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Space heating	0.85	0.85	0.85	0.85	0.48	1.14	0.66	1.40	1.23	0.60	1.06	0.98	0.63	1.00	1.04	0.61	0.67	0.63	0.63
Space cooling	0.56	0.55	0.52	0.54	0.41	0.48	0.35	0.45	0.32	0.36	0.43	0.37	0.41	0.40	0.29	0.43	0.41	0.38	0.38
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.26	0.25	0.24	0.26	0.24	0.26	0.27	0.25	0.33	0.29	0.32	0.34	0.34	0.31	0.35	0.26	0.30	0.30	0.33
Service water heating	1.08	1.07	1.07	1.07	1.07	1.07	0.40	0.44	0.38	0.40	0.44	0.40	0.42	0.44	0.39	0.43	0.45	0.45	0.49
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

X3-3 School End Use Performance Factors (EUPF, Carbon Emissions)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.22	0.22	0.21	0.21	0.21	0.22	0.21	0.22	0.22	0.22	0.22	0.22	0.21	0.22	0.22	0.22	0.21	0.21	0.23
Exterior lighting	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20
Space heating	0.74	0.73	1.27	0.90	1.18	1.52	1.38	0.91	0.80	0.28	0.66	0.67	0.35	0.61	0.55	0.36	0.37	0.37	0.45
Space cooling	0.54	0.62	0.54	0.62	0.51	0.71	0.50	0.69	0.59	0.45	0.68	0.68	0.62	0.72	0.79	0.61	0.65	0.66	0.73
Pumps	0.56	0.56	0.56	0.57	0.55	0.57	0.58	0.59	0.74	0.57	0.60	0.64	0.59	0.61	0.61	0.99	0.97	0.19	0.26
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.74	0.53	0.68	0.53	0.58	0.47	0.53	0.42	0.50	0.64	0.41	0.54	0.64	0.41	0.61	0.61	0.53	0.62	0.65
Service water heating	0.62	0.63	0.64	0.64	0.65	0.65	0.67	0.67	0.67	0.68	0.68	0.68	0.69	0.69	0.69	0.70	0.70	0.70	0.71
Commercial Refrigeration	0.78	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.78	0.77	0.78	0.77
Elevators	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Other regulated	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97

X3-4 Health Care / Hospital End Use Performance Factors (EUPF, Carbon Emissions)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.60	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.57	0.57	0.59	0.57	0.57	0.57	0.58
Exterior lighting	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Space heating	0.72	0.72	0.81	0.95	0.72	0.83	0.81	0.91	0.97	0.82	0.87	0.67	0.62	0.76	0.80	0.59	0.72	0.67	0.70
Space cooling	0.62	0.62	0.61	0.62	0.56	0.56	0.47	0.51	0.45	0.36	0.45	0.33	0.43	0.41	0.34	0.46	0.41	0.45	0.36
Pumps	0.84	0.85	0.90	0.87	0.75	0.69	0.66	1.09	1.32	0.88	0.99	1.11	1.59	1.03	0.89	1.60	1.11	1.35	0.84
Heat rejection	0.74	0.60	0.67	0.61	0.65	1.18	0.65	1.49	1.49	0.75	1.06	1.13	0.84	0.77	1.52	0.82	0.78	0.96	0.94
Fans	0.64	0.63	0.64	0.63	0.64	0.62	0.65	0.58	0.62	0.62	0.51	0.61	0.62	0.50	0.62	0.61	0.54	0.58	0.59
Service water heating	0.89	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Commercial Refrigeration	0.83	0.83	0.82	0.82	0.82	0.82	0.81	0.82	0.82	0.81	0.81	0.81	0.81	0.81	0.80	0.80	0.80	0.80	0.79
Elevators	0.56	0.43	0.56	0.43	0.56	0.43	0.43	0.43	0.43	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Other regulated	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99

X3-5 Restaurant End Use Performance Factors (EUPF, Carbon Emissions)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.31	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.32
Exterior lighting	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.22
Space heating	1.16	1.62	1.22	1.13	1.41	1.12	1.39	1.22	1.22	1.07	1.22	1.21	1.01	1.06	1.19	0.95	0.98	0.95	0.93
Space cooling	0.60	0.59	0.57	0.57	0.54	0.60	0.51	0.58	0.50	0.51	0.59	0.52	0.54	0.61	0.56	0.57	0.60	0.56	0.55
Pumps	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.50	0.44	0.47	0.43	0.45	0.40	0.45	0.41	0.42	0.45	0.42	0.44	0.45	0.43	0.45	0.43	0.41	0.42	0.42
Service water heating	1.20	1.20	1.17	1.18	1.16	1.16	1.13	1.13	1.12	1.11	1.11	1.10	1.09	1.10	1.09	1.08	1.09	1.07	1.06
Commercial Refrigeration	0.75	0.75	0.74	0.74	0.74	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

X3-6 Hotel/Motel End Use Performance Factors (EUPF, Carbon Emissions)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.31	0.31	0.31	0.31	0.30	0.31	0.30	0.31	0.32	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.30	0.31	0.31
Exterior lighting	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Space heating	0.45	0.30	0.46	0.36	0.54	0.61	0.65	0.48	0.54	0.37	0.50	0.45	0.32	0.42	0.44	0.35	0.42	0.42	0.47
Space cooling	0.62	0.60	0.62	0.60	0.58	0.56	0.54	0.63	0.62	0.57	0.56	0.53	0.60	0.55	0.49	0.63	0.59	0.58	0.54
Pumps	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.67	0.72	0.45	0.51	0.50	0.43	0.44	0.47	0.42	0.41	0.43	0.49
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.86	0.78	0.89	0.78	0.83	0.75	0.81	0.75	0.74	0.81	0.70	0.75	0.80	0.70	0.77	0.79	0.73	0.76	0.77
Service water heating	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.75	0.76
Commercial Refrigeration	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Elevators	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Other regulated	0.97	0.97	0.97	0.97	0.96	0.96	0.96	0.96	0.97	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96

X3-7 Warehouse End Use Performance Factors (EUPF, Carbon Emissions)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.14	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.15	0.19	0.19	0.19	0.20
Exterior lighting	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.28
Space heating	0.89	0.89	1.00	1.23	0.50	0.92	0.72	1.22	1.68	0.80	0.83	0.94	0.80	0.82	0.99	0.72	0.73	0.59	0.63
Space cooling	0.40	0.46	0.35	0.44	0.30	0.33	0.27	0.34	0.25	0.24	0.30	0.20	0.22	0.27	0.14	0.20	0.21	0.17	0.13
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.28	0.28	0.26	0.27	0.24	0.25	0.20	0.23	0.16	0.13	0.18	0.15	0.11	0.15	0.16	0.08	0.09	0.07	0.08
Service water heating	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

X3-8 Multifamily End Use Performance Factors (EUPF, Carbon Emissions)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Exterior lighting	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Space heating	0.53	0.66	0.31	0.74	0.32	0.44	0.77	0.63	1.07	0.44	0.41	0.43	0.44	0.39	0.31	0.50	0.46	0.52	0.63
Space cooling	0.58	0.54	0.60	0.56	0.62	0.65	0.65	0.70	0.41	0.74	0.81	1.01	0.86	0.91	1.50	0.85	0.96	0.84	1.18
Pumps	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.76	0.85	0.31	0.57	0.43	0.21	0.35	0.42	0.16	0.22	0.14	0.12
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.75	0.60	0.61	0.56	0.56	0.54	0.50	0.51	0.25	0.46	0.43	0.40	0.40	0.41	0.41	0.36	0.37	0.38	0.43
Service water heating	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Other regulated	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89

X3-9 All Other End Use Performance Factors (EUPF, Carbon Emissions)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.34	0.34	0.35	0.35	0.29	0.28	0.30	0.29	0.35	0.32	0.29	0.33	0.31	0.31	0.38	0.35	0.32	0.34	0.35
Exterior lighting	0.23	0.23	0.28	0.23	0.24	0.25	0.24	0.25	0.25	0.26	0.22	0.25	0.24	0.24	0.24	0.24	0.23	0.23	0.22
Space heating	0.95	0.88	0.61	0.88	0.60	0.85	0.84	0.99	1.06	0.57	0.75	0.67	0.56	0.64	0.65	0.51	0.52	0.51	0.59
Space cooling	0.58	0.59	0.56	0.59	0.47	0.50	0.46	0.53	0.46	0.50	0.53	0.67	0.53	0.58	0.63	0.58	0.57	0.54	0.51
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.59	0.52	0.52	0.51	0.46	0.40	0.43	0.39	0.39	0.42	0.37	0.41	0.40	0.36	0.52	0.41	0.44	0.47	0.50
Service water heating	0.91	0.88	0.84	0.88	0.87	0.89	0.80	0.82	0.80	0.81	0.77	0.81	0.80	0.81	0.70	0.78	0.75	0.74	0.80
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

f. For source energy, replace Table 4.2.1.1 with Tables X4-1 to X4-9.

X4-1 Office End Use Performance Factors (EUPF, Source Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.29
Exterior lighting	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.19
Space heating	0.76	0.75	0.71	0.92	0.57	0.81	0.97	1.17	0.62	0.63	0.80	0.82	0.64	0.78	0.91	0.66	0.72	0.55	0.59
Space cooling	0.63	0.65	0.62	0.64	0.53	0.64	0.49	0.63	0.51	0.46	0.60	0.51	0.54	0.59	0.47	0.55	0.53	0.50	0.50
Pumps	0.72	0.71	0.71	0.71	0.67	0.69	0.66	0.73	0.46	0.50	0.67	0.62	0.91	0.63	0.69	0.88	0.82	0.65	0.65
Heat rejection	0.89	0.94	0.90	0.94	0.76	0.94	0.75	0.96	0.83	0.66	0.89	0.71	0.77	0.83	0.61	0.76	0.72	0.70	0.61
Fans	0.55	0.55	0.54	0.53	0.52	0.52	0.45	0.52	0.51	0.49	0.46	0.49	0.48	0.44	0.51	0.44	0.42	0.46	0.49
Service water heating	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	1.03
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Other regulated	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91

X4-2 Retail End Use Performance Factors (EUPF, Source Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.38	0.38	0.39	0.39	0.37	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.40	0.40	0.40	0.40
Exterior lighting	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Space heating	0.85	0.85	0.85	0.85	0.48	1.14	0.66	1.40	1.23	0.60	1.06	0.98	0.63	1.00	1.04	0.61	0.67	0.63	0.63
Space cooling	0.56	0.55	0.52	0.54	0.41	0.48	0.35	0.45	0.32	0.36	0.43	0.37	0.41	0.40	0.29	0.43	0.41	0.38	0.38
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.26	0.25	0.24	0.26	0.24	0.26	0.27	0.25	0.33	0.29	0.32	0.34	0.34	0.31	0.35	0.26	0.30	0.30	0.33
Service water heating	1.08	1.07	1.07	1.07	1.07	1.07	0.40	0.44	0.38	0.40	0.44	0.40	0.42	0.44	0.39	0.43	0.45	0.45	0.49
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

X4-3 School End Use Performance Factors (EUPF, Source Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.22	0.22	0.21	0.21	0.21	0.22	0.21	0.22	0.22	0.22	0.22	0.22	0.21	0.22	0.22	0.22	0.21	0.21	0.23
Exterior lighting	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20
Space heating	0.74	0.73	1.27	0.90	1.18	1.52	1.38	0.91	0.80	0.28	0.66	0.67	0.35	0.61	0.55	0.36	0.37	0.37	0.45
Space cooling	0.54	0.62	0.54	0.62	0.51	0.71	0.50	0.69	0.59	0.45	0.68	0.68	0.62	0.72	0.79	0.61	0.65	0.66	0.73
Pumps	0.56	0.56	0.56	0.57	0.55	0.57	0.58	0.59	0.74	0.57	0.60	0.64	0.59	0.61	0.61	0.99	0.97	0.19	0.26
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.74	0.53	0.68	0.53	0.58	0.47	0.53	0.42	0.50	0.64	0.41	0.54	0.64	0.41	0.61	0.61	0.53	0.62	0.65
Service water heating	0.62	0.63	0.64	0.64	0.65	0.65	0.67	0.67	0.67	0.68	0.68	0.68	0.69	0.69	0.69	0.70	0.70	0.70	0.71
Commercial Refrigeration	0.78	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.78	0.77	0.78	0.77
Elevators	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Other regulated	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97

X4-4 Health Care / Hospital End Use Performance Factors (EUPF, Source Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.60	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.57	0.57	0.59	0.57	0.57	0.57	0.58
Exterior lighting	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Space heating	0.70	0.70	0.79	0.93	0.71	0.80	0.78	0.87	0.94	0.74	0.81	0.64	0.59	0.72	0.78	0.56	0.67	0.64	0.67
Space cooling	0.62	0.62	0.61	0.62	0.56	0.56	0.47	0.51	0.45	0.36	0.45	0.33	0.43	0.41	0.34	0.46	0.41	0.45	0.36
Pumps	0.84	0.85	0.90	0.87	0.75	0.69	0.66	1.09	1.32	0.88	0.99	1.11	1.59	1.03	0.89	1.60	1.11	1.35	0.84
Heat rejection	0.74	0.60	0.67	0.61	0.65	1.18	0.65	1.49	1.49	0.75	1.06	1.13	0.84	0.77	1.52	0.82	0.78	0.96	0.94
Fans	0.64	0.63	0.64	0.63	0.64	0.62	0.65	0.58	0.62	0.62	0.51	0.61	0.62	0.50	0.62	0.61	0.54	0.58	0.59
Service water heating	0.87	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.67
Commercial Refrigeration	0.83	0.83	0.82	0.82	0.82	0.82	0.81	0.82	0.82	0.81	0.81	0.81	0.81	0.81	0.80	0.80	0.80	0.80	0.79
Elevators	0.56	0.43	0.56	0.43	0.56	0.43	0.43	0.43	0.43	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Other regulated	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99

X4-5 Restaurant End Use Performance Factors (EUPF, Source Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.31	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.32
Exterior lighting	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.22
Space heating	1.16	1.62	1.22	1.13	1.41	1.12	1.39	1.22	1.22	1.07	1.22	1.21	1.01	1.06	1.19	0.95	0.98	0.95	0.93
Space cooling	0.60	0.59	0.57	0.57	0.54	0.60	0.51	0.58	0.50	0.51	0.59	0.52	0.54	0.61	0.56	0.57	0.60	0.56	0.55
Pumps	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.50	0.44	0.47	0.43	0.45	0.40	0.45	0.41	0.42	0.45	0.42	0.44	0.45	0.43	0.45	0.43	0.41	0.42	0.42
Service water heating	1.03	1.03	1.02	1.02	1.01	1.01	1.00	1.00	1.00	0.99	0.99	0.98	0.98	0.98	0.98	0.97	0.97	0.97	0.96
Commercial Refrigeration	0.75	0.75	0.74	0.74	0.74	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

X4-6 Hotel/Motel End Use Performance Factors (EUPF, Source Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.31	0.31	0.31	0.31	0.30	0.31	0.30	0.31	0.32	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.30	0.31	0.31
Exterior lighting	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Space heating	0.45	0.30	0.46	0.36	0.54	0.61	0.65	0.48	0.54	0.37	0.50	0.45	0.32	0.42	0.44	0.35	0.42	0.42	0.47
Space cooling	0.62	0.60	0.62	0.60	0.58	0.56	0.54	0.63	0.62	0.57	0.56	0.53	0.60	0.55	0.49	0.63	0.59	0.58	0.54
Pumps	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.67	0.72	0.45	0.51	0.50	0.43	0.44	0.47	0.42	0.41	0.43	0.49
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.86	0.78	0.89	0.78	0.83	0.75	0.81	0.75	0.74	0.81	0.70	0.75	0.80	0.70	0.77	0.79	0.73	0.76	0.77
Service water heating	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.75	0.76
Commercial Refrigeration	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Elevators	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Other regulated	0.97	0.97	0.97	0.97	0.96	0.96	0.96	0.96	0.97	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96

X4-7 Warehouse End Use Performance Factors (EUPF, Source Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.14	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.15	0.19	0.19	0.19	0.20
Exterior lighting	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.28
Space heating	0.89	0.89	1.00	1.23	0.50	0.92	0.72	1.22	1.68	0.80	0.83	0.94	0.80	0.82	0.99	0.72	0.73	0.59	0.63
Space cooling	0.40	0.46	0.35	0.44	0.30	0.33	0.27	0.34	0.25	0.24	0.30	0.20	0.22	0.27	0.14	0.20	0.21	0.17	0.13
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.28	0.28	0.26	0.27	0.24	0.25	0.20	0.23	0.16	0.13	0.18	0.15	0.11	0.15	0.16	0.08	0.09	0.07	0.08
Service water heating	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

X4-8 Multifamily End Use Performance Factors (EUPF, Source Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Exterior lighting	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Space heating	0.49	0.66	0.31	0.74	0.32	0.44	0.77	0.56	0.96	0.39	0.36	0.38	0.39	0.34	0.27	0.44	0.41	0.46	0.56
Space cooling	0.58	0.54	0.60	0.56	0.62	0.65	0.65	0.70	0.41	0.74	0.81	1.01	0.86	0.91	1.50	0.85	0.96	0.84	1.18
Pumps	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.76	0.85	0.31	0.57	0.43	0.21	0.35	0.42	0.16	0.22	0.14	0.12
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.75	0.60	0.61	0.56	0.56	0.54	0.50	0.51	0.25	0.46	0.43	0.40	0.40	0.41	0.41	0.36	0.37	0.38	0.43
Service water heating	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Other regulated	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89

X4-9 All Other End Use Performance Factors (EUPF, Source Energy)

End-use	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Interior lighting	0.34	0.34	0.35	0.35	0.29	0.28	0.30	0.29	0.35	0.32	0.29	0.33	0.31	0.31	0.38	0.35	0.32	0.34	0.35
Exterior lighting	0.23	0.23	0.28	0.23	0.24	0.25	0.24	0.25	0.25	0.26	0.22	0.25	0.24	0.24	0.24	0.24	0.23	0.23	0.22
Space heating	0.95	0.88	0.61	0.88	0.60	0.84	0.84	0.97	1.01	0.54	0.75	0.64	0.55	0.63	0.64	0.50	0.51	0.50	0.58
Space cooling	0.58	0.59	0.56	0.59	0.47	0.50	0.46	0.53	0.46	0.50	0.53	0.67	0.53	0.58	0.63	0.58	0.57	0.54	0.51
Pumps	0.80	0.80	0.84	0.80	0.75	0.79	0.84	0.70	0.74	0.39	0.56	0.48	0.54	0.47	0.57	0.60	0.70	0.51	0.50
Heat rejection	0.82	0.77	0.78	0.77	0.70	1.09	0.70	1.25	0.98	0.70	1.06	0.80	0.81	0.80	1.52	0.80	0.77	0.93	0.94
Fans	0.59	0.52	0.52	0.51	0.46	0.40	0.43	0.39	0.39	0.42	0.37	0.41	0.40	0.36	0.52	0.41	0.44	0.47	0.50
Service water heating	0.88	0.86	0.83	0.86	0.86	0.89	0.80	0.82	0.80	0.80	0.77	0.81	0.80	0.81	0.70	0.77	0.75	0.74	0.79
Commercial Refrigeration	0.78	0.78	0.80	0.78	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.79	0.80	0.79	0.80	0.80	0.79	0.80	0.80
Elevators	0.52	0.50	0.57	0.50	0.52	0.51	0.50	0.51	0.51	0.54	0.51	0.53	0.52	0.52	0.53	0.52	0.51	0.52	0.51
Other regulated	0.94	0.94	0.91	0.94	0.94	0.94	0.95	0.94	0.93	0.93	0.96	0.93	0.94	0.94	0.97	0.95	0.95	0.96	0.96

g. Add the following informative note to Section 4.2.1.1 below the tables:

Informative Note: "Other regulated" category includes *regulated energy use* of systems and components that are not explicitly included in the table, such as transformers.

h. Modify equation in Section 4.2.1.1(c) as follows:

$$PCI_t = [BBUE\text{C} + \text{(BPFxBBREC)} \; \underline{\sum(EUPF_i \; x \; BEUE_i)} – PRE]/BBP$$

i. Modify the legend in Section 4.2.1.1 (c) as follows, referencing the appropriate set of tables based on the selected metric.

> $EUPF_i$ ~~BPF~~ = End Use Performance Factor (selected metric) for regulated end use "i" from Tables 4.2.1.X-1 to 4.2.1.X-9 for the appropriate building type and climate zone ~~*building performance factor from Table 4.2.1.1.*~~ For *building* area types not listed in Table 4.2.1.1, use "All others." Where a *building* has multiple *building* area types, the required $\underline{EUPF_i}$ ~~BPF~~ shall be equal to the area-weighted average of the *building* area types based on their *gross floor area*. Where a project includes an *existing building* and an *addition*, the required ~~BPF~~ $\underline{EUPF}$ shall be equal to the area-weighted average, based on the *gross floor area*, of the *existing building* $\underline{EUPFi}$ ~~BPF~~ determined as described in Section 4.2.1.3 and the *addition* $EUPF_i$ ~~BPF~~ $\underline{\text{from Tables 4.2.1.X-1 to 4.2.1.X-9}}$

> $BEUE_i$ ~~BBREC~~ = ~~baseline *building* regulated *energy cost*~~, the portion of the annual ~~*energy cost*~~ (selected metric) of a baseline building design that is due to *regulated energy* end use "i"

j. Delete the following paragraph from Section 4.2.1.1 (c) "~~Regulated *energy* cost shall be calculated by multiplying the total *energy* cost by the ratio of *regulated energy use* to total *energy* use for each *fuel* type. Unregulated *energy* cost shall be calculated by subtracting regulated *energy* cost from total *energy* cost.~~"

k. Delete informative notes 4 and 5 from Section 4.2.1.1 (c).

l. Modify Section 4.2.1.3 (c) as follows, referencing the set of EUPF tables appropriate for the selected metric:

1. *Alterations* that meet the criteria in Section G3.1.4(a) shall use the ~~BPF~~ $\underline{EUPFs}$ from Table 4.2.1.X-1 to Table 4.2.1.X-9 for the following end uses: interior lighting, exterior lighting, service water heating, refrigeration equipment (regulated), elevators and escalators, other regulated. EUPFs for all other end uses shall be multiplied by ~~1.05~~ 1.10.

2. All other *alterations* modeled following Section G3.3 shall use ~~BPF~~ $\underline{EUPF}$ = 1 for all end uses.

XX4. CHANGES TO NORMATIVE APPENDIX G

a. Replace references to "energy cost" with references to "site energy," "source energy," or "carbon emissions" as appropriate in Sections G1.2.2, G1.3.2, G2.1, G2.4.2, and G2.5 section headings and bodies.

b. Modify Section G1.3.2 item (a) as follows referencing the appropriate set of tables based on the selected metric:

> a. The *simulation program* used, the version of the *simulation program*, and the results of the *energy* analysis including the calculated values for the baseline *building* unregulated $\underline{\text{<selected metric>}}$ ~~*energy* cost~~ (BBUE~~C~~), baseline *building* ~~regulated *energy* cost~~ <selected metric> $\underline{\text{use for each regulated end use included in Tables 4.2.1.X-1 to Table 4.2.1.X-9}}$ (~~BBREC~~ $\underline{BEUE}$) , *building* <selected metric> $\underline{\text{*end use*}}$ performance factors (~~BPF~~ $\underline{EUPF}$), *baseline building performance*, the *proposed building performance*, Performance ~~Cost~~ Index (P~~C~~I), and Performance ~~Cost~~ Index Target (P~~C~~I*t*).

c. Remove Section G1.3.2 item (n).

d. Modify Section G2.4.2 to remove the first sentence and the informative note. Add the following to the first paragraph: $\underline{\text{The *proposed design* <selected metric> and the *baseline design* <selected metric> shall be determined using the conversion factors in Table I4-1.}}$

XX5. SITE ENERGY USE LANGUAGE EXAMPLE

Modify Section 3 as follows:

baseline building performance: the annual $\underline{\text{site *energy use*}}$ ~~cost~~ for a *building* design intended for use as a baseline for rating above-standard design or when using the *Performance Rating Method* as an alternative path for minimum standard compliance in accordance with Section 4.2.1.1.

proposed building performance: the annual $\underline{\text{site *energy use*}}$ ~~cost~~ calculated for a *proposed design*.

Modify Section 4.2.1.1 (c) as follows:

$$\text{P}\cancel{\text{C}}\text{I}_t = [\text{BBUE}\cancel{\text{C}} + \cancel{(\text{BPFxBBREC})}\ \textstyle\sum(\underline{\text{EUPF}_{,\text{I}}\ \text{x}\ \text{BEUE}_i}) - \text{PRE}]/\ \text{BBP}$$

Where

P$\cancel{\text{C}}$I = Performance $\cancel{\text{Cost}}$ Index (site energy) calculated in accordance with Section G1.2.2

BBUE$\cancel{\text{C}}$ = baseline *building* unregulated <u>site</u> *energy* $\cancel{\text{cost,}}$ the portion of the annual <u>site</u> *energy* $\cancel{\text{cost}}$ of a *baseline building design* that is due to *unregulated energy use.*

<u>EUPFi</u> ~~BPF~~ = *building* ~~performance factor from Table 4.2.1.1.~~ <u>End Use Performance Factor (site energy) for regulated end use "i" from Tables 4.2.1.1-1 to 4.2.1.1-9 for the appropriate building type and climate zone.</u> For *building* area types not listed in ~~Table 4.2.1.1~~<u>Tables 4.2.1.1-1 to 4.2.1.1-9</u>, use "All others." Where a *building* has multiple *building* area types, the required <u>EUPFi</u> ~~BPF~~ shall be equal to the area-weighted average of the *building* area types based on their *gross floor area*. Where a project includes an *existing building* and an *addition*, the required <u>EUPFi</u> ~~BPF~~ shall be equal to the area-weighted average, based on the *gross floor area*, of the *existing building* <u>EUPFi</u> ~~BPF~~ determined as described in Section 4.2.1.3 and the *addition* <u>EUPFi</u> ~~BPF~~ from Tables <u>4.2.1.1-1 to 4.2.1.1-9</u>

<u>BEUE ᵢ,</u>~~BBREC~~ = ~~baseline *building* regulated *energy* cost,~~ the portion of the annual ~~*energy* cost~~ <u>site energy</u> of a *baseline building design* that is due to *regulated energy <u>end use "i"</u>*

PRE = PBP$_{nre}$ – PBP$_{pre}$

PBP = *proposed building performance*, including the reduced, annual ~~*purchased*~~ <u>site</u> *energy* ~~cost~~ associated with all *on-site renewable energy* generation *systems*

PBP$_{nre}$ = *proposed building performance* without any credit for reduced annual <u>site</u> *energy* ~~cost~~ from *on-site renewable energy* generation *systems*

PBP$_{pre}$ = *proposed building performance*, excluding any renewable *energy system* in the *proposed design* and including an *on-site renewable energy system* that meets but does not exceed the requirements of Section 10.5.1.1 modeled following the requirements for a *budget building design* in Table 12.5.1, row 15

BBP = *baseline building performance*

~~Regulated *energy* cost shall be calculated by multiplying the total *energy* cost by the ratio of *regulated energy use* to total *energy* use for each *fuel* type. Unregulated *energy* cost shall be calculated by subtracting regulated *energy* cost from total *energy* cost.~~

Table 4.2.1.1 Building Performance Factor (BPF)

~~Building Area Type~~	~~Climate Zone~~																		
	~~0A~~	~~0B~~	~~1A~~	~~1B~~	~~2A~~	~~2B~~	~~3A~~	~~3B~~	~~3C~~	~~4A~~	~~4B~~	~~4C~~	~~5A~~	~~5B~~	~~5C~~	~~6A~~	~~6B~~	~~7~~	~~8~~
~~Multifamily~~	~~0.69~~	~~0.68~~	~~0.71~~	~~0.70~~	~~0.72~~	~~0.72~~	~~0.71~~	~~0.76~~	~~0.63~~	~~0.69~~	~~0.76~~	~~0.71~~	~~0.66~~	~~0.72~~	~~0.71~~	~~0.65~~	~~0.67~~	~~0.65~~	~~0.67~~
~~Healthcare/hospital~~	~~0.69~~	~~0.69~~	~~0.70~~	~~0.68~~	~~0.67~~	~~0.65~~	~~0.65~~	~~0.66~~	~~0.64~~	~~0.64~~	~~0.66~~	~~0.63~~	~~0.67~~	~~0.65~~	~~0.65~~	~~0.66~~	~~0.67~~	~~0.68~~	~~0.70~~
~~Hotel/motel~~	~~0.66~~	~~0.66~~	~~0.69~~	~~0.65~~	~~0.65~~	~~0.64~~	~~0.64~~	~~0.65~~	~~0.65~~	~~0.63~~	~~0.65~~	~~0.63~~	~~0.62~~	~~0.63~~	~~0.62~~	~~0.61~~	~~0.62~~	~~0.59~~	~~0.58~~
~~Office~~	~~0.54~~	~~0.54~~	~~0.53~~	~~0.52~~	~~0.52~~	~~0.52~~	~~0.50~~	~~0.54~~	~~0.48~~	~~0.48~~	~~0.53~~	~~0.48~~	~~0.49~~	~~0.52~~	~~0.48~~	~~0.48~~	~~0.49~~	~~0.46~~	~~0.48~~
~~Restaurant~~	~~0.62~~	~~0.59~~	~~0.57~~	~~0.57~~	~~0.57~~	~~0.53~~	~~0.57~~	~~0.53~~	~~0.51~~	~~0.55~~	~~0.54~~	~~0.54~~	~~0.57~~	~~0.56~~	~~0.55~~	~~0.59~~	~~0.58~~	~~0.61~~	~~0.64~~
~~Retail~~	~~0.51~~	~~0.49~~	~~0.48~~	~~0.48~~	~~0.44~~	~~0.43~~	~~0.43~~	~~0.43~~	~~0.44~~	~~0.42~~	~~0.43~~	~~0.46~~	~~0.43~~	~~0.42~~	~~0.47~~	~~0.43~~	~~0.43~~	~~0.41~~	~~0.44~~
~~School~~	~~0.52~~	~~0.57~~	~~0.57~~	~~0.56~~	~~0.52~~	~~0.53~~	~~0.52~~	~~0.49~~	~~0.50~~	~~0.46~~	~~0.47~~	~~0.47~~	~~0.47~~	~~0.46~~	~~0.46~~	~~0.46~~	~~0.44~~	~~0.45~~	~~0.45~~
~~Warehouse~~	~~0.26~~	~~0.26~~	~~0.22~~	~~0.25~~	~~0.21~~	~~0.22~~	~~0.25~~	~~0.21~~	~~0.19~~	~~0.25~~	~~0.22~~	~~0.22~~	~~0.28~~	~~0.24~~	~~0.22~~	~~0.31~~	~~0.28~~	~~0.29~~	~~0.32~~
~~All others~~	~~0.62~~	~~0.60~~	~~0.62~~	~~0.59~~	~~0.55~~	~~0.51~~	~~0.53~~	~~0.52~~	~~0.55~~	~~0.53~~	~~0.52~~	~~0.55~~	~~0.53~~	~~0.53~~	~~0.56~~	~~0.54~~	~~0.54~~	~~0.54~~	~~0.54~~

Table 4.2.1.1-1 End Use Performance Factors (EUPF, Site Energy) Applicable Across All Climate Zones

<Include tables X2-1 to X2-9 and label them as Table 4.2.1.1-1 to 4.2.1.1-9>

Informative Note: "Other regulated" category includes *regulated energy use* of systems and components that are not explicitly included in the table, such as transformers.

When (PBP~pre~ – PBP)/BBP > 0.05, new *buildings*, *additions* to *existing buildings*, and/or *alterations* to *existing buildings* shall comply with the following:

$$\text{PCI} + [(\text{PBP}_{pre} - \text{PBP})/\text{BBP}] - 0.05 < \text{PCI}_t$$

Informative Notes:

1. PBP~nre~ = *proposed building performance*, no renewable *energy*.
2. PBP~pre~ = *proposed building performance*, prescriptive renewable *energy*.
3. PRE = prescriptive renewable *energy*.
4. ~~See Informative Appendix I for using other metrics, including *site energy*, source *energy*, and carbon emissions, in conjunction with the Normative Appendix G *Performance Rating Method* when approved by the *rating authority*.~~
5. ~~See Informative Appendix XX for using the End Use Performance Factors (EUPFs) instead of the BPFs in conjunction with the Normative Appendix G Performance Rating Method when approved by the rating authority.~~

Modify Section 4.2.1.3 (c) as follows:

c. Normative Appendix G, "Performance Rating Method," in accordance with Section 4.2.1.1 with the following modifications:

1. *Alterations* that meet the criteria in Section G3.1.4(a) shall use the ~~BPF~~ <u>EUPFs</u> from Table 4.2.1.1<u>-1 to Table 4.2.1.1-9</u> for the following end uses: interior lighting, exterior lighting, service water heating, refrigeration equipment (regulated), elevators and escalators, other regulated. EUPFs for all other end uses shall be multiplied by ~~1.05~~<u>1.10</u>.

   2. All other *alterations* modeled following Section G3.3 shall use ~~BPF~~ <u>EUPF</u> = 1 <u>for all end uses</u>.

Modify Section G1.2.2 as follows:
The performance of the *proposed design* is calculated in accordance with provisions of this appendix using the following formula:

Performance ~~Cost~~ Index = *Proposed building performance*/*Baseline building performance*

Both the *proposed building performance* and the *baseline building performance* shall include all enduse load components within and associated with the *building* when calculating the Performance ~~Cost~~ <u>Site</u> Energy Index.

Modify Section G1.3.2(a) and G1.3.2(p) as follows:
[. . .]
The following documentation shall be submitted to the *rating authority*:
a. The *simulation program* used, the version of the *simulation program*, and the results of the *energy* analysis including the calculated values for the baseline *building* unregulated *site energy* ~~cost~~ (BBUE~~C~~), baseline *building* regulated *site energy* ~~cost~~ <u>use for each regulated end use included in Tables 4.2.1.1-1 to Table 4.2.1.1-9</u> (~~BBREC~~ <u>BEUE</u>) , *~~building~~ site energy end use* performance factor<u>s</u> (~~BPF~~ <u>EUPF</u>), *baseline building performance*, the *proposed building performance*, Performance ~~Cost~~ Index (P~~C~~I), and Performance ~~Cost~~ Index Target (P~~C~~I*t*).
[. . .]
~~n. Purchased energy rates used in the simulations.~~
[. . .]
p. For any exceptional calculation methods employed, document the predicted *energy* savings by *energy* type, the <u>*site energy*</u> ~~cost~~ savings, a narrative explaining the exceptional calculation method performed and theoretical or empirical information supporting the accuracy of the method.

Modify Section G2.4.2 as follows:
G2.4.2 Annual ~~Energy Costs~~ <u>Site Energy</u>. ~~The *design energy cost* and baseline *energy cost* shall be determined using either actual rates for *purchased energy* or state average *energy* prices published by DOE's Energy Information Administration (EIA) for commercial *building* customers, but rates from different sources may not be mixed in the same project.~~ <u>The design site energy and baseline site energy shall be determined using the site energy conversion factors in Table I4-1.</u>

Where *on-site renewable energy* or *site-recovered energy* is used, the *baseline building design* shall be based on the *energy* source used as the backup *energy* source, or the baseline *system energy* source in that category if no backup *energy* source has been specified, except where the baseline *energy* source is prescribed in Table G3.1.1-2 and G3.1.1-3. Where the *proposed design* includes *on-site electricity generation systems* other than *on-site renewable energy systems*, the baseline design shall include the same generation

systems excluding its *site-recovered energy*.

Informative Note: ~~The above provision allows users to gain credit for features that yield load management benefits. Where such features are not present, users can simply use state average unit prices from EIA, which are updated annually and readily available on EIA's web site (http://www.eia.gov).~~

Modify Section G2.5(e) as follows:

….

e. The Performance ~~Cost~~ Index calculated with and without the exception.