



STATE OF WASHINGTON
STATE BUILDING CODE COUNCIL

Washington State Energy Code Development
Standard Energy Code Proposal Form

Log No. 120
 Revised ~~8/11/21~~
 8/19/21

Code being amended: Commercial Provisions Residential Provisions

Code Section # C406.2

Brief Description: This proposal is crafted to incorporate the increased acceptability of on and offsite renewables for C406 compliance.

Proposed code change text: (Copy the existing text from the Integrated Draft, linked above, and then use underline for new text and ~~strikeout~~ for text to be deleted.)

**TABLE C406.2
 EFFICIENCY MEASURE CREDITS**

Measure Title	Applicable Section	Group R-1	Group R-2	Group B	Group E	Group M	All Other
1. Dwelling unit HVAC control	C406.2.1	NA	7	NA	NA	NA	NA
2. Improved HVAC TSPR ^a	C406.2.2.1	NA	8	11	17	22	NA
3. Improve cooling and fan efficiency	C406.2.2.2	2	1	2	2	3	2
4. Improve heating efficiency	C406.2.2.3	2	3	3	10	16	7
5. DOAS & fan control^b	C406.2.2.4	138	NA	NA	NA	NA	NA
<u>6. High performance DOAS</u>	<u>C406.2.2.54</u>	<u>17731</u>	<u>19331</u>	<u>2721</u>	<u>5439</u>	<u>1340</u>	<u>9221</u> <u>/(A)</u> <u>40^b</u>
<u>6. Fault detection & diagnostics (FDD)</u>	<u>C406.2.2.5</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>6</u>	<u>9</u>	<u>4</u>
7. 10% reduced lighting power	C406.2.3.1	7	4	18	16	20	15
8. 20% reduced lighting power ^{ac}	C406.2.3.2	13	8	36	32	40	29
9. Lamp Efficacy Improvement	C406.2.3.3	5	6	NA	NA	NA	NA
10. Residential lighting control	C406.2.4.1	NA	8	NA	NA	NA	NA
11. Enhanced lighting control	C406.2.4.2	1	1	6	6	11	6
12. <u>Onsite</u> Renewable energy	C406.2.5	7	12	13	13	10	11
13. Shower drain heat recovery	C406.2.6.1	9	30	NA	3	NA	NA
14. Service water heat recovery	C406.2.6.2	35	111	13	14	(Grocery) 41 ^d	NA

15. Heat Pump water heating	C406.2.6.3	81	261	17	33	(Grocery) 95 ^d	(A-2) 95 ^e
16. Heat trace system	C406.2.7.1	6	13	4	1	NA	26 6
17. Point of use water heater	C406.2.7.2	NA	NA	56 19	45 5	NA	NA
18. Auto thermostatic balancing valves	C406.2.7.3	2	3	4	4	2	2
19. Service Hot Water Distribution Right Sizing	C406.2.8	13	42	NA	NA	NA	NA
20. Enhanced envelope performance^{e,1}	C406.2.9	24	20	13	5	19	14
21. Reduced air infiltration^{e,1}	C406.2.10	29	24	6	3	9	11
22. Enhanced commercial kitchen equipment	C406.2.11	NA	NA	NA	NA	NA	(A-2) 31^e
23. Enhanced residential kitchen equipment	C406.2.12	12	19	NA	NA	NA	NA
23. Enhanced residential laundry equipment	C406.2.13	NA	6	NA	NA	NA	NA
24. Efficient elevator equipment	C406.2.13.14	3	5	5	5	4	4

Commented [RH1]: Make NA for R-1 & R-2 if proposal 21-GP1-136 passes

- Projects using ~~Item 2~~ may not use ~~Items 3 or 4.5.~~
- ~~This option is not available to buildings subject to the prescriptive requirements of Section C403.3.5. For C406.2.2.4 occupancy Group A achieves 51 credits while other occupancy groups achieve 13 credits.-~~
- ~~Projects using C406.2.3.2 may not use C406.2.3.1.~~
- ~~Buildings or building areas that are exempt from thermal envelope requirements in accordance with Sections C402.1.1 and C402.1.2 do not qualify for these package measure.~~
- Service water heat recovery and heat pump water heating are available in Group M only for supermarkets. Large mixed retail with full grocery and butcher sections shall achieve half the credits.
- Heat pump water heating and kitchen equipment efficiency are available in other only for Group A-2.
- ~~Buildings or building areas that are exempt from thermal envelope requirements in accordance with Sections C402.1.1 and C402.1.2 do not qualify for these measures.~~

C406.2.5 On-site Renewable energy. Projects installing *on-site or offsite renewable energy* systems with a capacity of at least 0.1 watts per gross square foot (1.08 W/m²) of building area in addition to the ~~on-site renewable energy~~ capacity required ~~by Section C412 elsewhere in this code, without exception,~~ shall achieve energy credits for this measure. Renewable energy systems ~~installed on-site as part of this requirement achieving energy credits~~ shall not be used to satisfy other requirements of this code. Off-site renewable energy systems shall comply with sections C406.2.5.2 and C406.2.5.3. Credits shall be prorated from the table value as follows:

$$AEC_{RRa} = (AEC_{0.1} \times \frac{RR_t - RR_r}{0.1 \times PGFA}) \times REF$$

Where:

AEC_{RRa} = C406.2.5 achieved energy credits for this project

RR_t = actual total rating of on-site renewable energy systems (W)

RR_r = rating of *on-site renewable energy* systems required by ~~Section C412 other sections in this code (W), without exception~~

$PGFA$ = Project gross floor area, ft²

$AEC_{0.1}$ = C406.2.5 base credits from Table C406.2

REF = Renewable Energy Factor from Table C406.2.5.1

Table C406.2.5.1: Multipliers for Renewable Energy Procurement Methods

Location	Renewable Energy Source	Renewable Energy Factor		
		In the state of Washington	Western Interconnect	In the states of Oregon or Idaho
On-Site	On-site renewable energy system	1	NA	NA
Off-Site	<i>Directly owned off-site renewable energy system that begins operation after submission of the initial permit application</i>	<u>0.95</u>	<u>0.75</u>	<u>0.85</u>
Off-Site	<i>Community renewable energy facility that begins operation after submission of the initial permit application</i>	<u>0.95</u>	<u>0.75</u>	<u>0.85</u>
Off-Site	<i>Directly owned off-site renewable energy system that begins operation before submission of the initial permit application</i>	<u>0.75</u>	<u>0.55</u>	<u>0.65</u>
Off-Site	<i>Community renewable energy facility that begins operation before submission of the initial permit application</i>	<u>0.75</u>	<u>0.55</u>	<u>0.65</u>
Off-Site	<i>Renewable Power Purchase Agreement (PPA)</i>	<u>0.75</u>	<u>0.55</u>	<u>0.65</u>

C406.2.5.2 Documentation requirements for off-site renewable energy systems. Off-site renewable energy delivered or credited to the building project to comply with C406.2.5 shall be subject to a legally binding contract to procure qualifying off-site renewable energy. Qualifying off-site renewable energy shall meet the following requirements:

1. Documentation of off-site renewable energy procurement shall be submitted to the *code official*.
2. The purchase contract shall have a duration of not less than 15 years. The contract shall be structured to survive a partial or full transfer of ownership of the building property.
3. Records on renewable power purchased by the building owner from the off-site renewable energy generator that specifically assign the RECs to the building owner shall be retained or retired by the building owner on behalf of the entity demonstrating financial or operational control over the building seeking compliance to this standard and made available for inspection by the *code official* upon request.
4. Where multiple buildings in a building project are allocated energy procured by a contract subject to this section, the owner shall allocate for not less than 15 years the energy procured by the contract to the buildings in the building project. A plan on operation shall be developed which shall indicate how renewable energy produced from on-site or off-site systems that is not allocated before issuance of the certificate of occupancy will be allocated to new or existing buildings included in the building project.

C406.2.5.3 Renewable Energy Certificate Tracking. For multitenant buildings where RECs are transferred to tenants, the plan for operation shall include procedures for tracking the quantity and vintage of RECs that are required to be retained and retired. The plan shall include provisions to transfer the RECs to building tenants, or to retire RECs on their behalf in proportion to the gross conditioned and semiheated floor area leased or rented. The plan shall include provisions to use a REC tracking system that meets the requirements of Section V.B of the Green-e Framework for Renewable Energy Certification. The plan shall describe how the building owner will procure alternative qualifying renewable energy in the case that the renewable energy producer ceases.

Informative note:

Onsite renewable energy may include thermal service water heating or pool water heating in which case ratings in Btu/h can be converted to W where $W = \text{Btu/h} / 3.413$.

Purpose of code change: Adding offsite renewables allows projects to receive credit for the energy produced from their portion of a solar array, this code change proposal allows for participation in an offsite renewables project to be brought into the code for projects where installing on-site renewables is not feasible for C406 compliance.

Your amendment must meet one of the following criteria. Select at least one:

- Addresses a critical life/safety need.
- The amendment clarifies the intent or application of the code.
- Addresses a specific state policy or statute.
(Note that energy conservation is a state policy)
- Consistency with state or federal regulations.
- Addresses a unique character of the state.
- Corrects errors and omissions.

Check the building types that would be impacted by your code change:

- Single family/duplex/townhome
- Multi-family 4 + stories
- Institutional
- Multi-family 1 – 3 stories
- Commercial / Retail
- Industrial

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Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

This proposal results in 0.1 watts per gross square foot – 0.065 watts per gross square foot of renewable energy being installed on behalf of building owners, tenants and businesses for them to net-meter with their respective utility as well as retire Renewable Energy Certificates on the REC marketplace.

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life CycleCost [Analysis tool](#) and [Instructions](#); use these [Inputs](#). **Webinars on the tool can be found [Here](#) and [Here](#)**)

Show calculations here, and list sources for costs/savings, or attach backup data pages

\$1.72/Wdc installed cost for nonresidential PV systems as per Solar Energy Industries Association Data and NREL. PV costs will continue to follow their steady curve downward in price as California solar mandates come online.

Prototype	Floor Area	# of Stories	kW Required	kWh Generation	Installed System Cost	Annual Energy Cost Savings	Simple Payback
Large Office	498,000	13	249	273,900	\$428,280	\$25,253.58	16.95
Medium Office	53,600	3	27	29,480	\$46,096	\$2,718.06	16.95
Small Office	5,500	1	3	3,025	\$4,730	\$278.91	16.95
Standalone Retail	24,700	1	12	13,585	\$21,242	\$1,252.54	16.95
Stripmall Retail	22,500	1	11	12,375	\$19,350	\$1,140.98	16.95
Primary School	73,960	1	37	40,678	\$63,606	\$3,750.51	16.95
Secondary School	210,900	2	105	115,995	\$181,374	\$10,694.74	16.95
Warehouse	49,495	1	25	27,222	\$42,566	\$2,509.89	16.95
Mid-rise Apartment	33,700	4	17	18,535	\$28,982	\$1,708.93	16.95
High-rise Apartment	84,360	10	42	46,398	\$72,550	\$4,277.90	16.95

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

Click here to enter text.KWH/ square foot (or) Click here to enter text.KBTU/ square

foot(For residential projects, also provide Click here to enter text.KWH/KBTU /

dwelling unit)

Show calculations here, and list sources for energy savings estimates, or attach backup data

pagesSEE ABOVE

List any code enforcement time for additional plan review or inspections that your proposal will

require, in hours perpermit application:

There will be a very minimal work done in plan review to ensure a renewable energy system sized based on floor area is included. The renewable energy system will require field inspection per electrical permit requirements in the case of on-site solar. In the case of offsite solar this "field time" would be spent inspecting documentation of the off-site purchase.

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.