

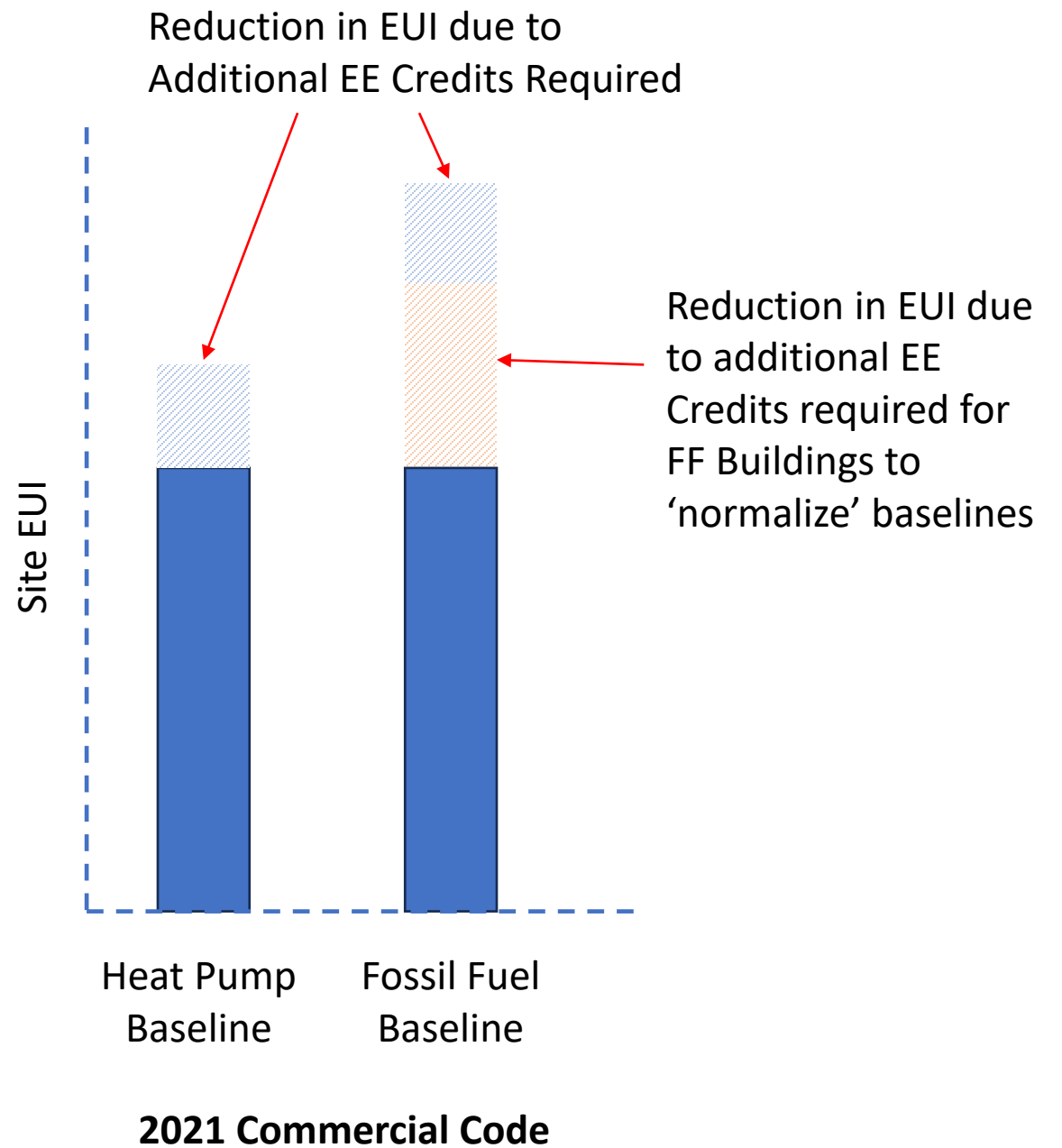
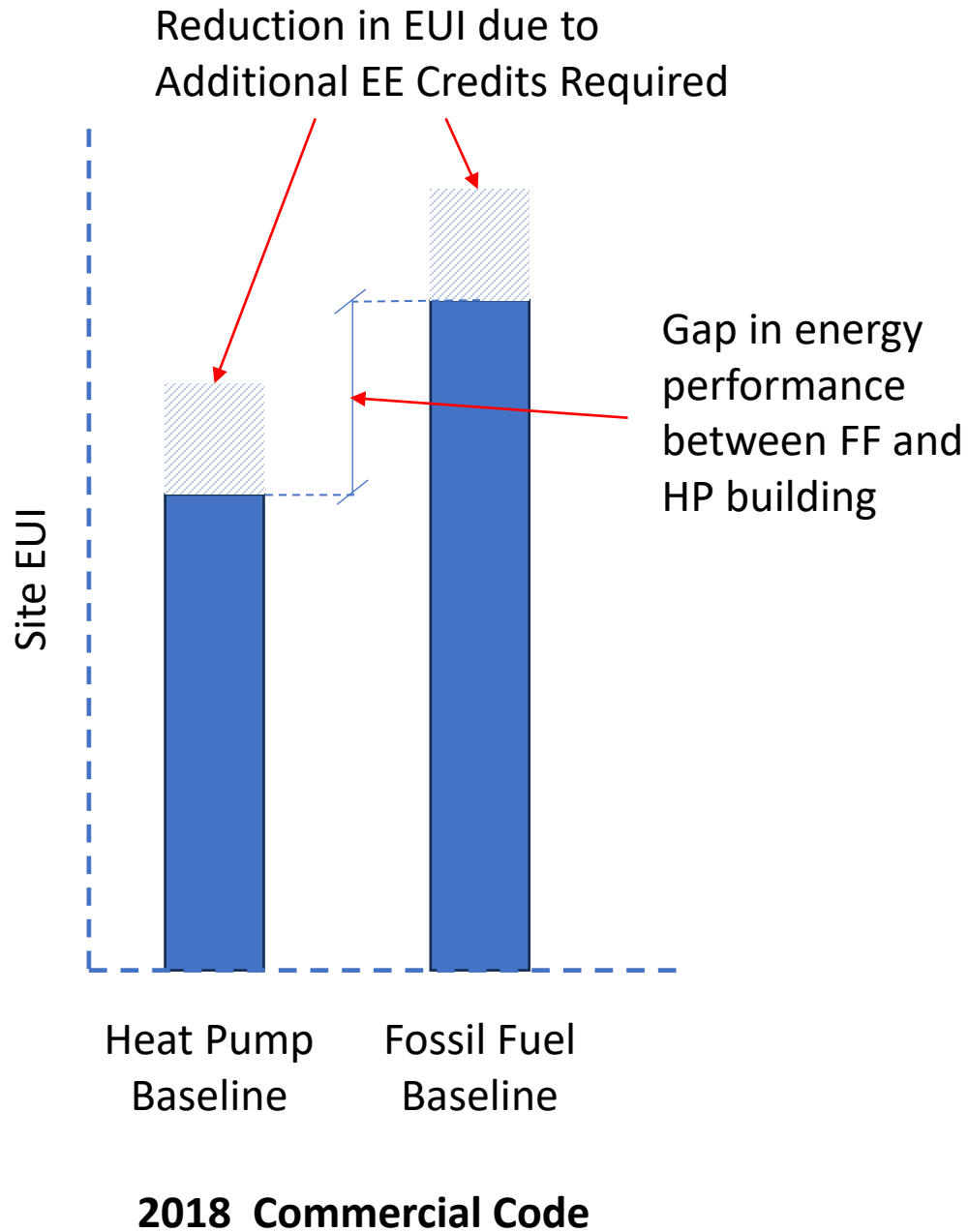


2021 Washington State Energy Code Commercial Proposals

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What would compliance look like for a FF building?

- Several options:
 - More efficient HVAC equipment + EE measures
 - More efficient HVAC equipment + HE FF Appliances
 - Mix of fossil fuel and heat pump technology
 - Fed minimum equipment + EE measures + solar
 - Fed minimum equipment + EE measures + max solar

More Efficient HVAC Equipment + EE Measures

- Example, Group R-2. Required points = $41 + 204 + 22 = 267$ Credits
 - High Performance DOAS = 40 credits
 - + Shower Drain Heat Recovery = 75 credits
 - + Enhanced Reduced Air Leakage = 44 credits
 - + Improved cooling/fan eff (15%) = 18 credits
 - + Heat Trace System = 33 credits
 - + Service HW dist. right sizing = 42 credits
 - + Enhanced comm. Kitchen equip = 15 credits
 - Total = 267 Credits

More Efficient HVAC Equipment + HE Gas WH + EE Measures

- Example, Group R-2. Required points = 41 + 204 + 22 = 267 Credits

High Performance DOAS	= 40 credits
+ HE Gas Water Heating	= 65 credits
+ Enhanced Reduced Air Leakage	= 44 credits
+ Improved cooling/fan eff (15%)	= 18 credits
+ Heat Trace System	= 33 credits
+ Service HW dist. right sizing	= 42 credits
+ Enhanced envelope perf.	= 26 credits
Total	= 268 Credits

More Efficient HVAC Equipment + Partial Electrification + EE Measures

- Example, Group R-2. Required points = $41 + 204 + 22 = 267$ Credits
 - High Performance DOAS = 40 credits
 - + HP Water Heating (33%) = 75 credits
 - + Enhanced Reduced Air Leakage = 44 credits
 - + Improved cooling/fan eff (15%) = 18 credits
 - + Heat Trace System = 33 credits
 - + Service HW dist. right sizing = 42 credits
 - + Enhanced comm. Kitchen equip = 15 credits
 - Total = 267 Credits

More Efficient HVAC Equipment + Renewable Energy + EE Measures

- Example, Group R-2. Required points = $41 + 204 + 22 = 267$ Credits

High Performance DOAS = 40 credits

+ Renewable Energy Credits (33%) = 75 credits

+ Enhanced Reduced Air Leakage = 44 credits

+ Improved cooling/fan eff (15%) = 18 credits

+ Heat Trace System = 33 credits

+ Service HW dist. right sizing = 42 credits

+ Enhanced comm. Kitchen equip = 15 credits

Total = 267 Credits

Fed Mini Equipment + Renewable Energy + EE Measures

- Example, Group R-2. Required points = $41 + 204 + 22 = 267$ Credits
 - High Performance DOAS = 40 credits
 - + Renewable Energy Credits = 93 credits
 - + Enhanced Reduced Air Leakage = 44 credits
 - + Improved cooling/fan eff (0%) = 0 credits
 - + Heat Trace System = 33 credits
 - + Service HW dist. right sizing = 42 credits
 - + Enhanced comm. Kitchen equip = 15 credits
 - Total = 267 Credits

(Equation 4-17)

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

Where:

AEC_{RRa} = Section C406.2.5 achieved energy credits for this project as calculated in accordance with Equation 4-17, limited to 50 percent of the required credits in Section C406.1.

Exception: Up to 80 percent of the additional efficiency credits required by Table C406.1.3.1 and Table C406.1.3.2, are permitted to be **Renewable Energy credits defined in Section C406.2.5.**

Fed Mini Equipment + Max Renewable Energy + EE Measures

- Example, Group R-2. Required points = $41 + 204 + 22 = 267$ Credits

High Performance DOAS = 40 credits

+ Renewable Energy Credits = 180 credits ← 80% of 226

+ Lamp Efficacy Improvement = 5 credits

+ Service HW dist. right sizing = 42 credits

Total = 267 Credits

Other Building Examples – Group B

- Example, Group B. Required points = $42 + 27 + 101 = 170$ Credits

High Performance DOAS	= 27 credits
+ 20% reduced lighting control	= 31 credits
+ Renewable Energy Credits	= 46 credits
+ Enhanced Reduced Air Leakage	= 11 credits
+ Enhanced Envelope Perf.	= 17 credits
+ Heat Trace System	= 10 credits
+ Enhanced comm. Kitchen equip	= 15 credits
Total	= 170 Credits

Other Building Examples – Group B

- Example, Group B. Required points = $42 + 27 + 101 = 170$ Credits

High Performance DOAS = 27 credits

+ 20% reduced lighting control = 31 credits

+ Renewable Energy Credits = 102 credits ← 80% of 128

+ Heat Trace System = 10 credits

Total = 170 Credits

Other Building Examples – Group E

- Example, Group E. Required points = $48 + 17 + 38 = 103$ Credits
 - High Performance DOAS = 51 credits
 - + 20% reduced lighting control = 27 credits
 - + Enhanced comm. Kitchen equip = 26 credits
 - Total = 104 Credits

Other Building Examples – Group M

- Example, Group M. Required points = 74 + 79 + 111 = 264 Credits

High Performance DOAS	= 52 credits
+ 20% reduced lighting control	= 34 credits
+ Enhanced comm. kitchen equip	= 26 credits
+ Service Water Heat Recovery	= 103 credits
+ Enhanced Envelope Perf.	= 25 credits
+ Improved TSPR	= 29 credits
Total	= 269 Credits

What would compliance look like for a HP building?

- Example, Group R-2. Required points = 41 Credits
+ Service HW dist. right sizing = 42 credits
Total = 42 Credits
- Example, Group E. Required points = 48 Credits
+ High Performance DOAS = 39 credits
+ 10% lighting pwr reduction = 16 credits
Total = 55 Credits
- Example, Group M. Required points = 74 Credits
+ High Performance DOAS = 40 credits
+ 20% lighting pwr reduction = 40 credits
Total = 80 Credits

