



Memorandum

DATE: February 16, 2021
 TO: County Council’s Planning & Development Committee
 FROM: Curtis Metz, Building Services Supervisor
 THROUGH: Mark Personius, Director
 RE: Comparison of the Costs Associated with 2015 and 2018 Energy Codes

Purpose

At the February 9, 2021, meeting of the Council’s Planning & Development Committee, staff presented an ordinance amending Title 15 (Building & Construction) that would adopt the 2018 International Building and associated Codes, with some local amendments to some of the administrative rules and appendices. It was noted that the new energy code requirements, becoming stricter so as to meet requirements as set forth by RCW 19.27A.020 and .160 to reduce energy consumption, would add some new costs to the price of building homes. The Committee asked for an estimate of what these costs might be for a typical house built in Whatcom County. This memo attempts to answer that question, and staff will attend your February 23rd meeting to discuss.

Cost Comparison between the 2015 and 2018 Energy Codes

The Credit Requirement Table compares the change in the number of required credits that need to be gained from the 2015 Energy Code to the 2018 Energy Code for a given size structure or addition.

Table 1. Credit Requirements Table

	Credit requirements	
	2015 Code	2018 Code
Heated living space only, does not include garages, porches, etc.		
Additions less than 500 SF	0.5	1.5
Small Dwelling units, less than 1,500 SF of conditioned floor area with less than 300 SF of fenestration and additions greater than 500 SF but less than 1,500 SF	1.5	3
All dwelling units that are not included in category #1, #2 or #4	3.5	6
Large dwelling units, exceeding 5,000 SF	4.5	7

The Fuel Normalization Table increases or decreased the number of required credits depending on which type of heating system you choose. In the following example we use the “Heat Pump” option which will reduce our required credits by (1).

Table 2. Fuel Normalization Table

2018 Credit Adjustments for Heat Type Used

LP/Nat ^a FAU or zonal	Heat Pump ^b	Electric resistant FAU or zonal	Heat Pump and Zonal ele.	Other heat type ^c
0	-1	1	0.5	-1
a. Equipment listed in Table C403.3.2(4) or C403.3.2 (5) b. Equipment listed in Table C403.3.2(1) or C403.3.2 (2) c. Hydronic heat systems, Solar heating systems, Ground source heat system				

In 2020 the average size house permitted in Whatcom County ranged from 1,850 to 2,000 SF of heated living space¹. The following example uses these sizes to compare Energy Credit requirements. From the Credit Requirement Table above, any house that is up to 4,000 SF would need to obtain 6 credits using up to 8 of the 27 credit options available. In the example below we used 6 different options to meet the minimum requirement of 6 credits.

The table on the following page, read from left to right, describes the most commonly used options and their credit values per the 2015 Energy Code. It then shows the credit value in the 2018 codes for those same options. As demonstrated by using the same options from the 2015 code to the 2018 code you would still need to obtain 3 more credits to meet the 2018 Energy Code requirements.

The next section of the same table, reading to the right, shows the change or additional options that would need to be done to meet the 2018 Energy Code requirements.

The final section gives the estimated price change for the adjusted or added options. From this comparison the estimated cost increase from the 2015 Energy Code requirements to the 2018 Energy Code requirements would be \$6,807.

Note, though, that this is just one path to meet the energy code requirements under the 2018 Energy Code, and is our best guess of what we may see submitted. There are 27 individual and separate options with varying credit values, each with its own associated cost. Although \$6,807 is not a small amount, the cost can be substantially more depending on what the homeowner or contractor decides to use on their house.

If builders or homeowners are looking for a less costly approach, the cheapest options would be to construct a house less than 1,500 sf (of heated living space). The cost would essentially be the same from the 2015 Energy Code to the 2018 Code, as demonstrated in the credit comparison in the table above.

¹ This only includes those portions of the heated living space; it does not include garages, porches, or covered porch areas.

The most common option used for 2015 energy credits	2015		2018		Adjustments	credits	Adj. Credits	Price difference
	Credits	option	credits	option				
Prescriptive method with the following modifications Window U factor from 0.30 to 0.28, Floor insulation from R30 to R38	0.5	1a	0.5	1.3	No change	0.5	\$0	No Change
Air leakage control from 5 air changes an hour to 3 air changes an hour	0.5	2a	0.5	2.1	Change to option 2.2 to 2 air changes an hour	1	\$500	This has to do with detail during construction, estimate \$500 for time and materials
High efficiency HVAC equipment with a minimum AFUE of 94% (Natural gas or Propane)	1	3a	1	3.1	Change to option 3.2 Heat pump ^b	1	Reduces credits by 1	94% FAU \$1346, to Heat Pump \$5630
Efficient Water Heater Natural gas or Propane water heater with a minimum EF of 0.91 (on-demand)	1.5	4c	1	5.3	Change to option 5.4 electric heat pump water heater	1.5	\$623	Tankless water heater \$1474, to Heat Pump water heater \$2097
Total Credits required = 3.5	3.5		3					
			Still need 3 credits		Additional credits used to meet requirements			
					Add option 4.1 locate ducts in conditioned space	0.5	\$500	This has to do with detail during construction estimate \$500 for time and materials
			6 credits required, minus 1 by using heat pump now only 5 credits required		Add option 7.1 energy star appliances	0.5	\$900	Average price upgrade to energy star \$225 x 4 Appliances
						Total 5 credits	Meet energy code requirements	
					Est. cost difference for 2018 energy code =		\$6,807	