Eligibility of projects with natural gas primary space heating and electric backup or supplemental heating

This bulletin provides guidance to energy advisors working on projects with primary and secondary heating systems where the secondary heating system is not a FortisBC energy source. Note that energy modelling the project based on these requirements and the resulting Step Code level will determine FortisBC's New Home Program's eligibility and incentive level.

The model for EnerGuide and Step Code compliance may differ to satisfy their requirements.

The New Home Program terms and conditions require that projects use FortisBC energy sources for their primary heating and domestic hot water. Primary energy source is defined as one that supplies at least 70% of the space heating system load (SHSL) for the property. This definition is consistent with the EnerGuide Rating System definition.

A house can have a secondary heating system that does not use a FortisBC energy source such as **1. Air-source heat pump** and **2. Electric baseboard.** The following describes how to energy model for these situations and FortisBC's submission requirements.

1. Air Source Heat Pump secondary or supplemental heating

For homes where FortisBC is not the electricity supplier, the energy model must demonstrate that a FortisBC energy source is the primary energy source. Other fields will appear to upload this additional information when secondary heating source is selected in the application form:

1. The HOT2000 energy modelling report specifically showing the Space Heating System Load (SHSL) and the Annual Furnace/Boiler Energy Consumption is at least **SHSL x 0.70 / AFUE.**
2. The BC Energy Compliance Report Calculator report demonstrating the Step Code level achieved using the FortisBC energy source as the primary energy source.

Modelling the house with the FortisBC energy source as the primary energy source:

1. Confirm that the FortisBC primary heating system has the capacity to supply at least 70% of the SHSL.
2. Determine the Annual Furnace/Boiler Energy Consumption required using the equation **SHSL x 0.70 / AFUE.**

Figure 1: Calculating the Furnace/Boiler Annual Energy Consumption: The furnace AFUE, in this case, is 96%. The required Furnace/Boiler Annual Energy consumption is therefore 44,387 MJ x 70% / 96% = 32,365 MJ

Space Heating System Load:	44387 MJ
Heat Pump and Furnace Annual COP:	1.179
Heat Pump Annual Energy Consumption:	5204 MJ
Furnace/Boiler Annual Energy Consumption:	32367 MJ
Annual Space Heating Energy Consumption:	37571 MJ

3. Modify the Heat Pump Temperature Cut-Off as shown in Figure 2 such that the energy model results in the Annual Furnace/Boiler Energy Consumption to be at least **SHSL x 0.70 / AFUE.**

Figure 2: Modelling an Air Source Heat Pump to satisfy primary heating load as 70% of SHSL: The Heat Pump Temperature Cut-Off is adjusted by trial and error until the energy model yields the required Furnace/Boiler Annual Energy Consumption.

SPACE HEATING SYSTEM

PRIMARY Space Heating Fuel:	Electricity
Space Heating Equipment:	Air Source Heat Pump
Manufacturer:	Rheem AHRI 8377644
Model:	RP1748AJVCA,RCF6021SEAMCA
Capacity at 8.3 °C:	13.6 kW
HSPF at 8.3 °C:	7.40
COP at 8.3 °C:	3.56
Crankcase Heater Power:	60.00 watts
Heat Pump Temperature Cut-Off:	Restricted Cut-off at 7.00 °C

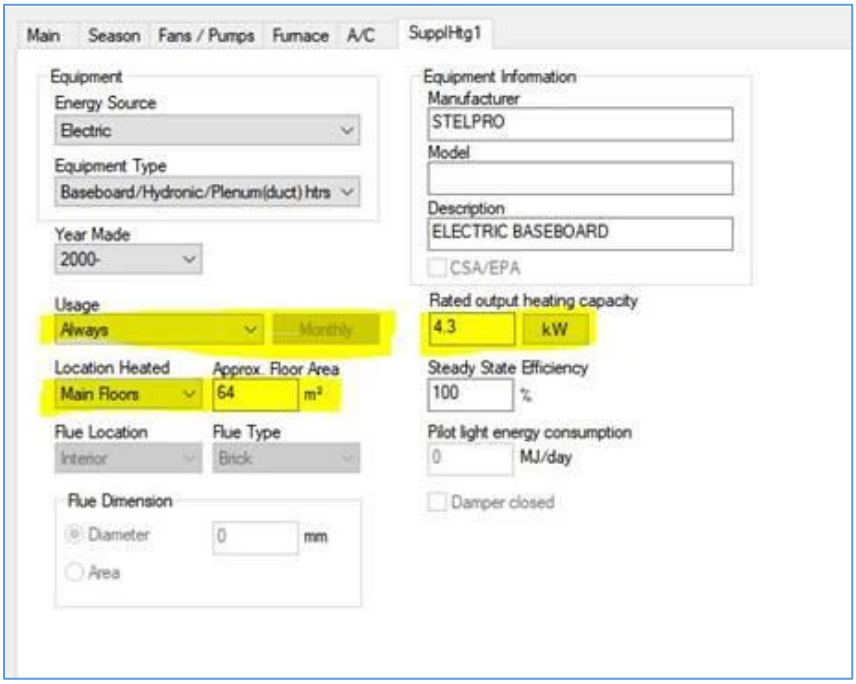
SECONDARY Heating Fuel:	Natural Gas
Equipment:	Condensing furnace/boiler
Manufacturer:	Rheem
Model:	R96VA0852521MSB
Specified Output Capacity:	24.00 kW

a. Air Source Heat Pump secondary or supplemental heating with secondary suites heated with electric baseboards

For homes where FortisBC is not the electricity supplier, the energy model must demonstrate that a FortisBC energy source is the primary energy source. Follow the steps in Section 1 above to model the home demonstrating FortisBC as the primary energy source using the heat pump. If 70% of the SHSL is not met with ASHP operating conditions adjustments due to the presence of electric baseboard heaters in a secondary suite, proceed with the following adjustments until the 70% threshold is met.

i. Modify the rated output heating capacity to refect actual capacity of the installed electric baseboards
ii. Revise the approximate floor area
iii. Adjust the supplementary heating system usage until FortisBC energy source supplies at least 70% of the SHSL.

Figure 3: Modelling an electric baseboard heater as a supplemental heating



2. Electric baseboard secondary or supplemental heating

For homes where FortisBC is not the electricity supplier, the energy model must demonstrate that a FortisBC energy source is the primary energy source. This is confirmed by submitting the following with the final construction online application. Upload fields will appear to upload this additional information (if required) when secondary heating source is selected in the application form:

1. The HOT2000 energy modelling report specifically showing the Space Heating System Load (SHSL) and the Annual Furnace/Boiler Energy Consumption is at least **SHSL x 0.70 / AFUE.**
2. The BC Energy Compliance Report Calculator demonstrating the Step Code level achieved using the FortisBC energy source as the primary energy source.

Methodology to modelling the house with the FortisBC energy source as the primary space heating energy source:

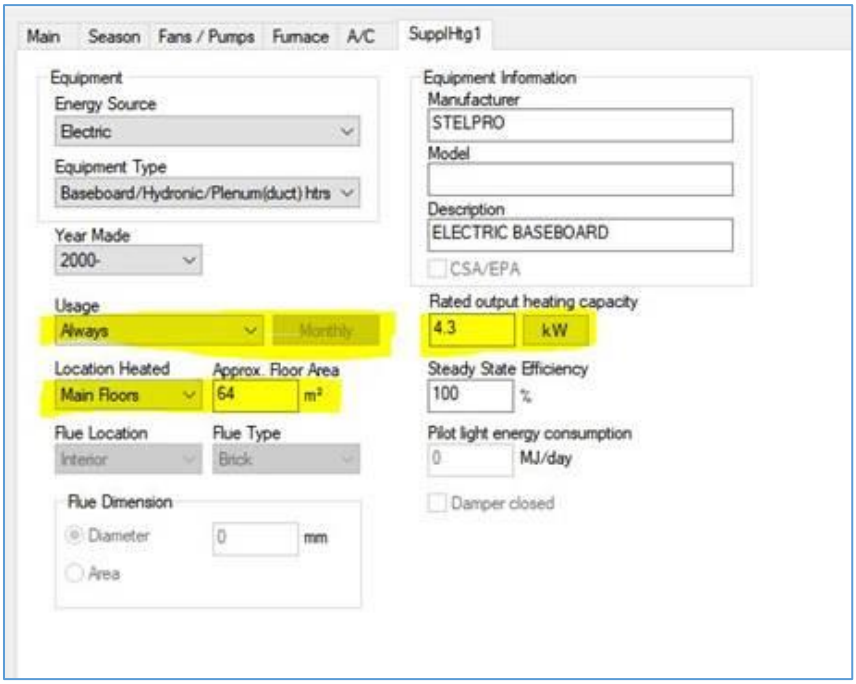
1. Determine the minimum Annual Furnace/Boiler Energy Consumption required using the equation **SHSL x 0.70 / AFUE.**
2. Confirm that the FortisBC primary heating system has the capacity to supply at least 70% of the SHSL.

3. i. If the primary energy source supplies heat to all areas with a secondary heating source, then the primary energy source should be modelled without adjustments to the HOT2000 model.

Or

ii. For spaces in the dwelling where the electric baseboard heater is the only heating source, the system needs to be modelled in HOT2000 as supplemental heating. The floor area heated by the supplemental heating system is specified, and the usage is selected as "always-on." Figure 4 shows the key fields to be modified.

Figure 4: Modelling an electric baseboard heater as a supplemental heating



Or

iii. **For Step 5 homes only** where the primary heating system is capable of meeting at least 70% of the SHSL and where to spaces with the primary and secondary heating sources are connected to a centralized HRV, the secondary energy consumption should result in the primary energy loads to be **SHSL x 0.70 / AFUE** through adjustment of the supplemental heated floor area. It is assumed in this case that the heat loss through the building envelope is so small that the HRV and heat gains will provide primary heat throughout the house, even in spaces that are not directly connected to that system.

3. Electric baseboard heating in secondary suites with natural gas as primary heating system

In homes where natural gas is used for the primary heating source, with electric baseboards used in a secondary suite, secondary modelling will not be required.