

## Validation of EnerBIM

EnerBIM is a tool developed by the Life Cycle Management Research Group at the University of British Columbia's Okanagan Campus. It is used to assess the BC Energy STEP Code compliance status of new buildings (currently for Part 9 buildings). The pathway for EnerBIM originates from the Building Information Model (BIM) developed for a proposed building using the Autodesk Revit software. Once the building architecture and the energy model is developed in Autodesk Revit, the data file is transferred to Autodesk Green Building Studio, which is an online platform that can run the energy models of the existing building design as well as possible design alternatives. The results file from Autodesk Green Building Studio is assessed in EnerBIM to identify the STEP Code compliance level of the preliminary building design and provide recommendations on how the desired compliance levels could be achieved via alternative designs, by considering the energy performance, investment and operational cost, and greenhouse gas emissions.

Prior to sending out the tool to the community, it is important to compare the results from the tool against the energy performance of actual buildings and check its acceptability among the experts in the industry. It is ideal to have the following data inputs for the validation process.

1. Building plans and layouts: This should include scaled drawings (plan views as well as cross-sections) of the building. The drawings must be detailed with dimensions and sections at appropriate locations.
2. Building material and properties: Here, the building materials used in the house (for walls, windows, doors, floor, and roof) should be specified along with their make, dimensions, thermal properties, and cost.
3. Building location and orientation
4. Building occupancy and usage patterns (or assumed occupancy patterns if any energy modelling was done during the design and construction process)
5. Details related to heating, air conditioning, hot water, and lighting systems used in the house: This should include the make, capacity, and the performance levels of the aforementioned systems.
6. Air tightness tests conducted on the building and their results

Currently, the research team at UBCO would like to demonstrate the developed tool to a group of builders specialising in the Part 9 building sector (ideally around 5 to 10 builders) and get their feedback on current version. We also hope to obtain the above information on actual buildings for the validation process from the builders. The expected time commitment from an individual builder is approximately three hours. (This may slightly vary based upon the requirements as the study progresses.) The inputs from a diverse group of builders representing different geographic locations and scales of operation will be beneficial to the researchers in further improving the EnerBIM tool and take it to a commercially ready state. Once the product has been finalised, the team intends to disseminate it among interested parties to support the STEP Code compliance efforts in BC.