# 6.1 Overview

This chapter methodically goes through the building descriptors for the proposed design and the baseline building, when applicable. The baseline building must be specified for most COMNET purposes. The building descriptors discussed in this chapter are also summarized in Appendix A in a more brief and tabular form.

# 6.1.1 Definition of Building Descriptors

Building descriptors provide information about the proposed design and the baseline building. In this chapter, the building descriptors are discussed in the generic terms of engineering drawings and specifications. By using generic building descriptors, this manual avoids bias toward one particular energy simulation engine. The building descriptors in this chapter are consistent with commonly used simulation software. Other building descriptors may be substituted as long as the input restrictions and definition of the baseline building conditions are consistent.

Each energy simulation program has its own way of accepting building information. EnergyPlus, for instance, uses a comma delimited data file called an IDF file. DOE-2 uses BDL (building design language) to accept information. It is the responsibility of the COMNET software developer to translate the generic terms used in this chapter into the "native language" of the simulation program used by the software. Figure 6.1.1-1 [1] illustrates the flow of information.
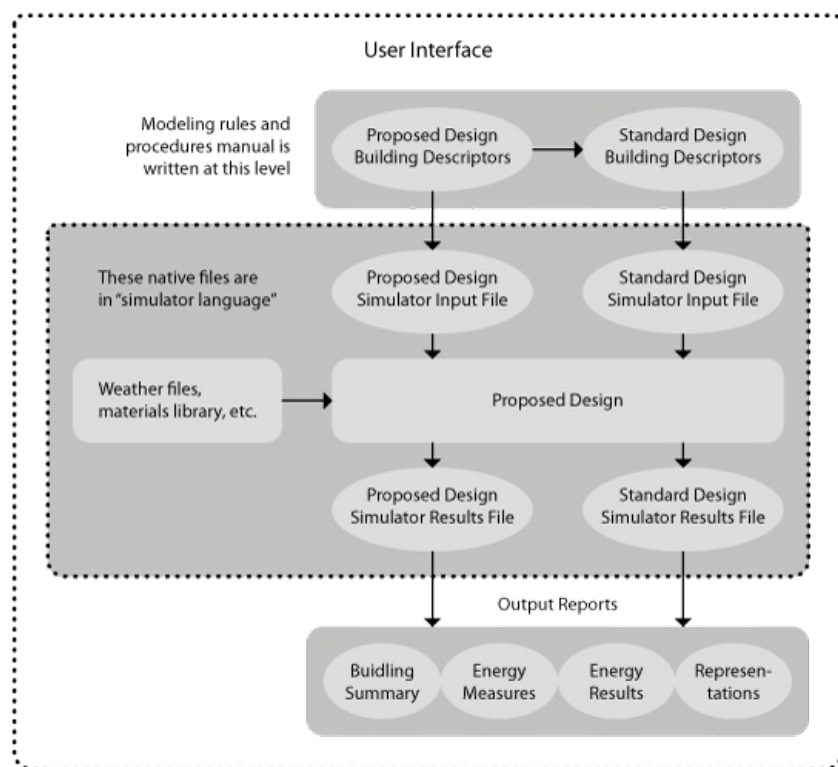


Figure 6.1.1-1: *"Information Flow"*

# 6.1.2 HVAC System Map

A baseline building is not used when COMNET is used for Design to Earn ENERGY STAR.

The HVAC system in the baseline building depends on the primary building activity, the size of the building and the energy source used for heating in the proposed design. Figure 6.1.2-1 [2] shows the HVAC system types that apply in each case. Details about these systems are provided in subsequent sections.

Many of the building descriptors have a one-to-one relationship between the proposed design and the baseline building, for example, every wall in the proposed design has a corresponding wall in the baseline building. For HVAC systems, this one-to-one relationship generally does not hold. The HVAC system serving the proposed design and the baseline building may be completely different, each with different components, etc.
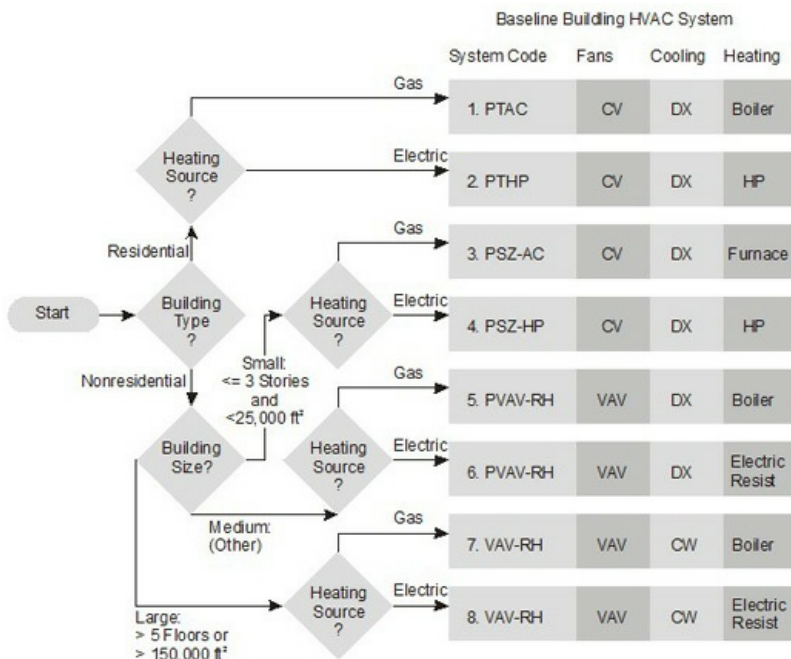
Figure 6.1.2-1: *"HVAC Mapping"*

For systems 1 through 4, each thermal block shall be served by a separate system. For systems 5 through 8, a single system serves the whole building with a separate air handler for each floor. Systems 5 and 6 are packaged equipment with DX cooling and fans combined in the same box. For these systems, each floor will have its own system.

There are several important exceptions to the HVAC mapping rules that apply to spaces with unusual internal heat gains, different schedules, special pressurization requirements, or unique outside air needs. These exceptions will typically apply to laboratories, data centers, and many spaces in healthcare facilities. See Chapter 7 for the special requirements for these building types. The exceptions are described below:

- Separate occupancies in mixed use buildings are served by separate baseline building systems. Examples include residential spaces located over retail and other similar conditions. (See the PRM, G3.1.1, Exception a.)
- A separate baseline building system shall serve laboratories or group of laboratories with an exhaust system designed for 5,000 cfm or more of air movement. The baseline building system serving the laboratory spaces shall be either system 5 (PVAV with hot water reheat) or system 6 (PVAV with parallel fan-powered boxes and electric reheat), depending on the heating source in the building. The PVAV system must be capable of reducing the exhaust and makeup air volume to 50% of design values during unoccupied periods. This exception essentially requires VAV for both the supply fan and the exhaust system. (See the PRM, G3.1.1, Exception c.)
- Spaces that do not trigger the laboratory exception above may still have a separate baseline building system. Either system 3 (PSZ-AC) or system 4 (PSZ-HP) shall serve spaces in the baseline building (depending on the heating source for the building) when one of the following conditions apply:
  - Spaces on a floor have significantly different schedules or internal heat loads. Heat gain differences of more than 10 Btu/h or operation schedule differences of more than 40 hours/week trigger this exception. (See the PRM, G3.1.1, Exception b.)
  - Spaces on a floor have "special pressurization relationships, cross-contamination requirements, or code-required minimum circulation rates". Many laboratory spaces with fume hoods would likely trigger this exception. (See the PRM, G3.1.1, Exception c.)

These special systems serve just the spaces that trigger the exceptions. The rest of the building/floor is served by the baseline building HVAC system and air handlers shown in Figure 6.1.2-1 [2].

# 6.1.3 Organization of Information

Building descriptors are grouped under objects or building components. A wall or exterior surface (an object) would have multiple building descriptors dealing with its geometry, thermal performance, etc. Each building descriptor contains the following pieces of information.

| Building Descriptor Title | |
| --- | --- |
| *Applicability* | Information on when the building descriptor applies to the proposed design |
| *Definition* | A definition for the building descriptor |
| *Units* | The units that are used to prescribe the building descriptor |
| *Input Restrictions* | Any restrictions on information that may be entered for the proposed desig |
| *Baseline Rules* | How the building descriptor applies to the baseline building |

**Links:**

[1] http://www.comnet.org/mgp/content/611-definition-building-descriptors#chapter-6-information-flow

[2] http://www.comnet.org/mgp/content/hvac-system-map#hvac-mapping