Energy Modeling

Energy can be saved by understanding the energy needs of the home during operation. This includes:

- Understanding the energy needs of the home during operation.
- Choosing the right building materials and systems.
- Using energy-efficient systems and products.
- Conducting an energy audit to identify areas for improvement.

Guidelines for Warmer Climates

Here are several issues that would be treated differently in warm climates:

- **Window Orientation**: The majority of windows should face north or south. Windows on the east and west should be minimized because they are more exposed to low angles of the sun and lead to overheating more than windows on the north or south.
- **Window Shading**: Every window should be shaded, whether with natural shading, by window overhangs of 3’ or more, by being recessed in thick walls, by curtains or in a sealed and insulated attic.
- **Air Sealing**: Carefully sealing the home's thermal envelope because air sealing is just as important in warmer climates as it is in cold climates. In hot climates, air leaks are more important during the day and rain air infiltration at night when outdoor temperatures are lower. Lower air leaks are especially important in hot climates because of the large surface area and high heat gains.
- **Insulation**: Floor and wall insulation can be reduced in warm climates. For wall insulation, values of R-13 in board thickness could be sufficient in some cases, optimum insulation levels and maximum recommended values with an energy model. The walls can be concrete block, rigid foam should be installed on the exterior. A slab foundation should not have insulation below the slab, as omitting it will reduce the home's cooling load. Rigid foam insulation can be used inside the walls, if necessary, to increase the thermal performance of the home.
- **Ducts Inside**: Very important when planning the new space heating and ventilation system. It is a good idea to use the existing ducts to minimize the cost of adding new ducts.
- **Universal Ventilation**: Ideally, heating and cooling from the attic should enter the house at the ceiling, and air should be exhausted from the attic at the floor. This will help to keep the attic cool during the summer and warm during the winter.
- **Duct Sealing**: It is important to use proper duct sealing to ensure that the air is distributed properly.
- **Humidity Control**: It is important to control the humidity levels to prevent mold and mildew growth.
- **Air Conditioning**: It is important to use energy-efficient air conditioning units.

It’s generally accepted that homes use more energy in climates that require more heating than cooling. Wisconsin is a good example of a heating-dominated climate, while Florida is clearly cooling-dominated. You can use the heating and cooling dominance of your state to help you in cooler weather climates.

First, there are generally fewer degrees of difference between indoor and outdoor conditions in warmer climates. In Florida, cooling a building from 80°F (26°C) to 75°F (24°C) requires 7.5 percent of the energy. This means that the same amount of dehumidification and cooling is required to keep the home comfortable.

There is a second reason that cooling takes less energy than heating. Cooling is always done with a refrigeration cycle. Air-conditioning systems that operate at very high efficiency. While heating is always done with steam or hot water, which must be heated to a much higher temperature.

Option 1: Use highly reflective roofing, while metal roofing or concrete roofing is preferable. If the home has an unvented attic, radiant barrier roof sheathing is recommended.

Option 2: Natural Shade

Select the building site for natural shade or design landscaping to create it. Depending on energy modeling.

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Air Sealing

Carefully sealing the home’s thermal envelope because air sealing is just as important in warmer climates as it is in cold climates. In warmer climates, air leaks reduce the home’s cooling load and allow humidity to enter the conditioned space, so air conditioners have to work harder. In humid climates, air-leaking vents from outdoors provide a means of mold and rot that will be reduced by air sealing.

Ducts Inside

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Water Heating

Water heaters are usually hot. Use efficient water heaters with tank or tankless systems. The most efficient water heater is a tankless system.

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