The main purpose of heating, cooling and ventilation systems is to provide a comfortable, healthy and productive indoor environment for the occupants. Indoor terminal units, which have a direct effect on the occupants comfort, can be defined as the building elements that use different heat transfer mechanisms and media to emit and remove heat or moisture from indoor spaces (e.g. hydronic radiant heating and cooling systems, fan-coil units, and active beams). The main differences between HVAC systems in Europe, North America and other parts of the world are often the indoor terminal units. Type of energy sources and energy generators are very much similar. This paper will present state-of-the-art energy efficient systems that will provide a good indoor environmental quality at a decreased energy use. Low Temperature Heating and High Temperature Cooling systems are an important requirement for increasing the energy efficiency of HVAC (heating, ventilation and air-conditioning) systems and for increasing the amount of renewable energy used. Especially these types of systems are getting increasing attention in Europe and North-America.

In the present study, operation characteristics, possibilities and limitations of different terminal units were specified. Considered terminal units were radiant heating and cooling systems, all-air systems (mixing, displacement, and personalized ventilation), passive and active beams.