

## Abstract

Rapid growth of industrial, and huge growth of population have led to tremendous energy demand in Palestine in recent years. Heating ventilation and air conditioning (HVAC) are among the most energy consuming systems in the world, therefore, these systems must be designed and operated effectively.

The main idea of the project is to assess an old heating and air-conditioning systems at Al-Rawda Complex. Moreover, a new efficient HVAC system is proposed and evaluated economically and environmentally.

The proposed new system is suitable for installation and retrofitting at the studied building taking into consideration the age and function of the building.

After reviewing different HVAC systems and analyzing the targeted building, it was found that the variable refrigerant flow (VRF) HVAC systems the best.

Among the methodology was calculating the thermal loads of the entire building, including the mosque and the dispensary, in addition to making a design and economic feasibility calculations for three different scenarios.

The third scenario was chosen as the most appropriate, realistic and reliable based on several factors.