

Summary

In this project we made the design of an air conditioning system for bus stations .it is proposed to make general improvements in the bus stations which includes from infrastructure changes until the implementation of a refrigeration system, having into account the following aspects:

- Energy demand required in the whole system must be covered at least for 50% of renewable energies, in this project it was used solar energy.
- Environmental conditions in the city; particular case Barranquilla/Colombia.
- Normativity and standards.
- Cost/benefit relation.

The development of the project not only began with the study of existing technologies, but also the future projection studies of such technologies. Basing on that, the calculation of the thermal load was realized having into account that there are many aspects which affect it and also that it is transitory. Afterward, we continue with the machine selection whose main selection criteria were that it must cover the system load and also it must be compact, being the last one the more important. Later, it was made studies of strain, stress and fatigue in the current structure; with these studies we modified the structure in order to ensure that this one will be able to endure the external load coming from the photovoltaic system and refrigeration machine. It was designed and evaluated three solution alternatives, each one satisfying the design expectation established by the engineering committee and those desired by the client. It was demonstrated the reaches and limitation this project could has, by evaluating the implementation of the project in a short, medium and long term in the country and abroad. Besides, in order to have more competitiveness and viability, this project is proposed as an energetic integration which it will also include the transformation of diesel buses into electric or hybrid buses. Solar energy source will provide charge to each one bus; thereby we could save money by decreasing the quantity of diesel used.

Keyword:

Solar energy, diesel, electric bus, air conditioning, transfer station, thermal load.