CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

In this dissertation, the case study of the medium scale mixed development building has shown the following:

i. Concept of using ETTV to estimate the cooling energy consumption of a building is feasible.

ii. Glass performance has a high impact on the ETTV. Each 0.1 SC value drop significantly reduces the ETTV by up to 4.73% with only an overall WWR of 0.29.

iii. ETTV is proportional to E_{cl} and E_c consumption. It was found that each W/m^2 of ETTV value has an impact of 1.95 kW cooling which translate to 0.65 kW energy usage in electrical kW using our case study building operation and building configuration. For the case study building, the following linear expression is applicable between the ETTV and E_c consumption for this particular case based on the values and graph plotted.

$$ETTV = 0.5239 \times E_c - 118.75 \quad (5.1)$$

iv. The cooling load required is proportional to the E_c consumption. Using a VRV system the translation from 1 kW of cooling to cooling electrical load is 0.333 kW with COP of 3. With use of more efficient air conditioning system, this can be greatly reduced. However the selection of air conditioning system will very much depend on the total required cooling load for a most cost effective operation in the long run.

The above values and impacts in the findings are only specific to the case study building and not a general statement for all buildings. However it can be concluded that:

i. ETTV has a linear proportion to the E_c consumption.
ii. Potential saving in term of energy is possible with a lower ETTV value.
iii. Proper selection of air conditioning system will greatly reduce the total cooling energy consumption.

5.2 RECOMMENDATIONS & FUTURE WORKS

Based on dissertation done, there are a few areas for improvements for future works that can be recommended. Firstly, the actual measurement of the data can be conducted to confirm the calculated values and correlation. By doing so, the ETTV, E_c and its correlation can be validated for future use for similar medium scale mixed development as a benchmark. Thus, the building performance can be cross-checked to ensure that it meets a certain level of building efficiency.

Secondly it is recommended that the correlation equation obtained between ETTV and E_c to be further developed by breaking down the constant shown in the formula to enable easier computation of ETTV or Ec feasible.

Lastly, similar studies can also be done for various different countries with different climate conditions as future works for reference and benchmarking as well. This is important to ensure new generations of more energy efficient building are continuously being built all over the world.