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## **Topic 1**

### **Did you know that, &**

Consultants looking into reduction of electricity consumption of air conditioners, claim that increasing room temperatures by 2 deg C would reduce kWh consumption by at least 10%.

### **Can you tell us, &**

On what basis this rule of thumb has been developed without writing a dissertation about it.

### **Explanation**

Factors influencing Air Conditioning load are

- 1 Heat gain through walls , windows (conduction).
- 2 Cooling of fresh air.
- 3 Internal heat generation like lighting, human heat load, computers etc.
- 4 Direct radiation through glass.

Of these , the 1<sup>st</sup> and 2<sup>nd</sup> are directly proportional to the temperature difference between ambient temperature and room temperature. Mostly 80 % of the A/C load is expected to be due to these reasons.

During summer season , the ambient temperature would vary between 35 to 40 °C. The required temperature for comfort conditions is 18 to 24 °C depending upon the humidity level maintained inside the conditioned space. For heating lower temperature is preferred. During Cooling the highest comfort temperature is preferred. Generally the setpoint temperature will be 18 to 20 °C .

By increasing the set point temperature from 20 °C to 22 °C, the del T will drop from 20 °C to 18 °C i.e 10 % decrease in del T between ambient temperature and room temperature, which leads to 10 % decrease in refrigeration effect .

***Thus 10 % decrease in energy consumption of A/C for the same COP is possible by increasing the room temperature by 2 °C.***

***Note : Reverse would be true for heating the room***