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Green and Smart Buildings

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Green and Smart Buildings

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Situation

- Some buildings are not energy efficient which causes the release of greenhouse gases resulting in global warming.

Problem

- Buildings in the United Arab Emirates use excess energy which harms the environment.

Solutions

- Using Solar panels as a source of clean energy. [1]

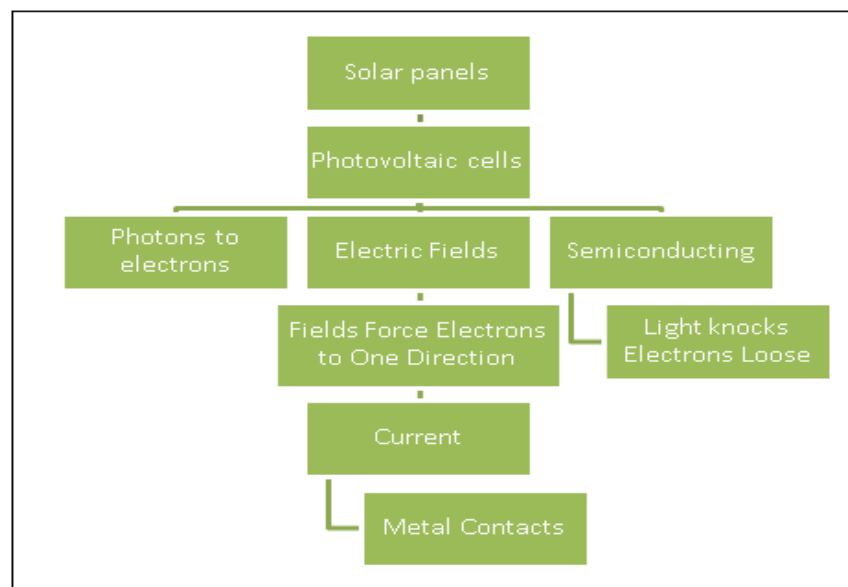


Figure 1: Solar panels way of working.

- Reducing the heat in building compared to - the outside temperature after using thermal insulators.
- Extruded polystyrene foam is one of the best materials for thermal insulation.
- Insulation in buildings saved up to 26% in present worth cost and reduced 33% of cooling load. [2]

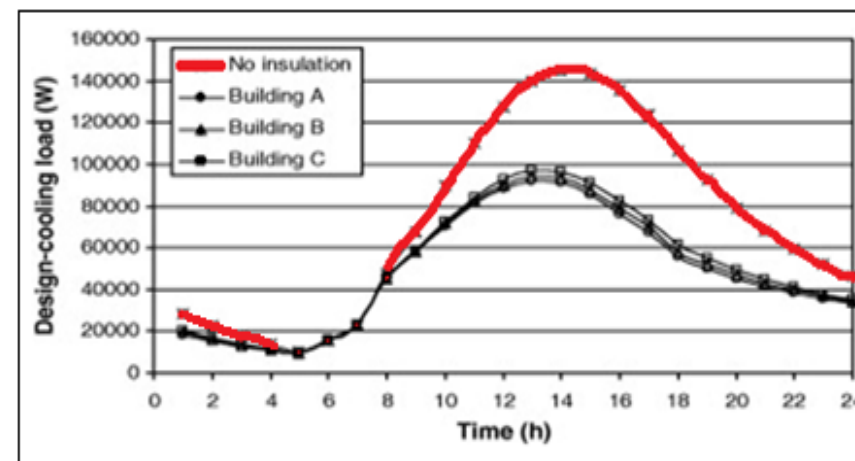


Figure 2: Variation of hourly cooling load of sample building. [2]

- Lighting systems have the largest potential of any known appliance to reduce energy use in a country. [3]

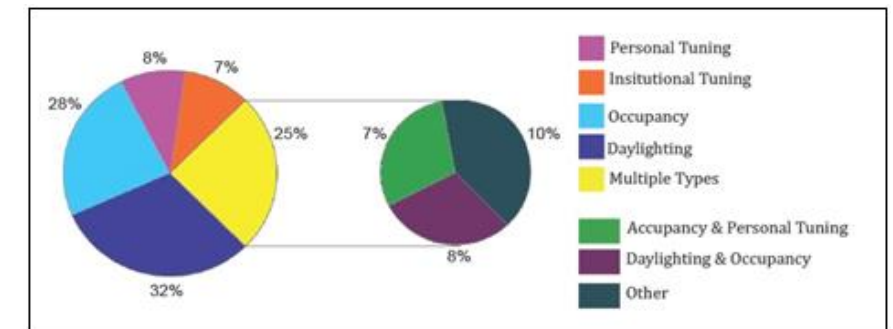


Figure 3: Strategy types. [3]

Evaluation

- Solar panels need regular cleaning and suffer from some energy losses.
- Coats are not easy to implement on built buildings.
- Lighting sensors have high cost and are difficult to install.

References

- [1] J. A. Duffie and W. A. Beckman, Solar engineering of thermal processes. New York: Wiley, 1991.
- [2] M. A. Aktacir, O. Büyükalaca, and T. Yılmaz, "A case study for influence of building thermal insulation on cooling load and air-conditioning system in the hot and humid regions," Applied Energy, vol. 87, pp. 599-607, 2010.
- [3] A. Williams, B. Atkinson, K. Garbesi, E. Page, and F. Rubinstein, "Lighting Controls in Commercial Buildings," LEUKOS, vol. 8, pp. 161-180, 2012.