Thesis Title Lighting Quality Analysis and Alternative Solutions
A Case Study of School Buildings, Government Buildings, and Office Buildings

Name Sa-nguansak Ka-uraphan

Degree Master of Science
(Appropriate Technology and Resource Development)

Thesis Supervisory Committee

Chirapol Sintunawa, Ph.D.

Chaiya Chamchoy, M.Eng.

Date of Graduation 2 May B.E. 2537 (1994)

Abstract

Electricity is vital to the growth and development of the country. However, the sources of energy for electricity production not been keeping up with the increase demand. The efficient use of electricity will help slow down the rate of increase in energy demand and with prolong the source of energy for future use.

This study revealed that illumination level of in surveyed school buildings, government buildings and office buildings are under standard. Lighting levels in school buildings are the worst, followed by government buildings and office buildings respectively. In addition, the luminaires used in these buildings are of low quality. This study compared three proposed alternatives: Alternative 1, Maintain the illumination level

and changing high efficiency luminaires. Alternative 2, increasing illumination levela to meet the standard and maintaining the existing luminaires. Alternative 3, increasing illumination level to meet standard and changing high efficiency luminaires. Alternattive 4, one-to-one existing luminaires with high efficiency luminaires. The study found that the third alternative is the best, as it provides illumination levels that meet the standard and utilizes electricity efficiently. By using the efficient luminaire model A for alternative 3, the electricity saving are 47%, 47% and 41% and payback time is 2.44 years, 1.31 years and 2.46 years, respectively, for school buildings, government buildings and office buildings.