# Regulation of Radiation Transmittance through Electro-Optic Technologies

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According to U.S. Energy Administration Information, each day more than 100 million of air conditioners use massive amount of energy to cool down the daily stuffiness, in U.S. The problem is that these air conditioning systems are fighting the heat that is already inside a closed room. In spite of the fact that the major part of heat enters the building through the windows (especially in buildings like sky-crappers and those with a big surface of windows), we are proposing a method which is able to regulate the amount of heat passed (in the form of Infrared electro-magnetic waves) through the window. Using a system of polarizers active specifically for the range of the IR spectrum with the highest irradiance, and a liquid crystal cell we can alter the energy transmittance of windows without blocking visible light. The main component of the layer is the liquid crystal cell; a crystal bounded by two plates which are connected to AC. When we apply small voltage to the plates a phenomenon named Pockels effect occurs, crystal molecules create a birefringent medium and rotate the polarization plane of the light wave, which passed the first polarizer, so that the second polarizer can partially block the Infrared radiation (heat). To sum up, we are proposing an additional layer which besides having minimal energy consumption and maximal yield, is also an eco-friendly air-cooling system.

**Awards Won:**

Third Award of $1,000