Reducing Carbon Emission? Alternative Energy Source – Stirling Engine

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Electricity is one of the most useful energy forms in our lives and is important to the world. As we know, one of the most common ways to generate electricity is through the burning of fossil fuels including coal, oil, and natural gas. But fossil fuels release carbon dioxide when burnt, which causes global warming, and are also non-renewable. In cities like Hong Kong, the effect of global warming is even more intense. Hot air is trapped between tall buildings in the urban areas, and this makes the temperatures in these areas unbearable during summer. This phenomenon is known as the heat island effect.

Based on the principles of 4R - recycle, reuse, replace and reduce, we would like to use the device Stirling engine as an alternative way to generate electricity. It has high efficiency compared with other engines, and is also eco -friendly, as it doesn't produce any by-products while running.

Being used in coalmines in the past for generating electricity, we found that the Stirling engine has not been fully utilized and developed. Our group devised ways to use this engine to solve the problem of the heat island effect in urban areas. One of the very applicable solutions we have come up with is the bus stop cover fan. We placed an inverted Stirling engine on top of a bus stop cover. The Stirling engine absorbs heat from the sun, and its flywheel can act as a fan to cool down the waiting passengers. Moreover, the kinetic energy generated by the engine can be further converted into electrical energy. The electricity generated can be used as a free cell phone charger for passengers. Our project also investigated how to increase the efficiency of the Stirling engine.