MSc Thesis project

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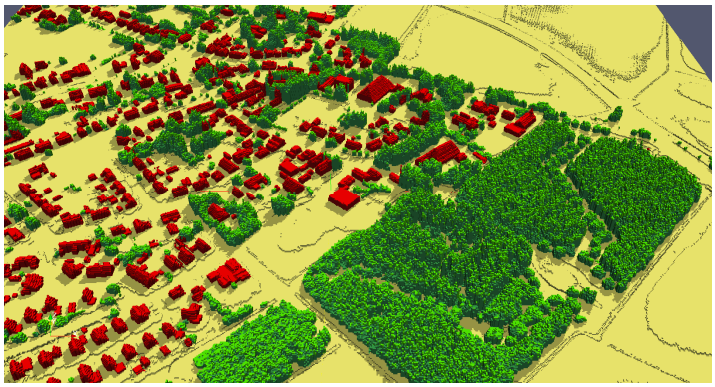
MSc track, Geoscience & Remote Sensing

Smart Operation of Solar Cell Powered Light Poles



Introduction

Traditionally, light poles are powered by the electrical grid. In remote places where electricity may not be available, a popular alternative is to rely on solar energy and photovoltaic cells. FlexSol is a young Delft-based company that develops flexible solar cells that can be embedded in sheets and bended around poles or incorporated in roof tiles, bringing light and power to many places around the world. There is, however, one important issue with solar energy: it requires a minimum amount of sunlight to work properly!

Assessing potential solar energy

The Dept. of Geoscience & Remote Sensing at TU Delft is developing tools and expertise that will allow FlexSol to precisely assess the potential solar energy available at a given location using both spatial and meteorological information. Digital surface models can be used to calculate total solar irradiance at a given location and predict what part of the day the solar cells will be in the shadows. In addition to spatial information, local weather forecasts, especially cloud cover maps coupled with time series of actual energy production can be used to better understand the system's overall performance and optimize energy consumption strategies.

Goal of the Project

As a MSc student your task will be to develop a set of tools to assess and compare the potential of a number of FlexSol test poles installed at the TU Delft campus, both from a geometrical and meteorological perspective. You will quantify how buildings and other objects affect solar irradiance at each site and investigate different ways in which local weather forecasts can be used to optimize power consumption. The goal is to provide FlexSol with simple guidelines on where to place solar powered street poles and how to operate them in an optimal way. Your work could take place both at FlexSol and at the TU Delft.

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