2. Technical report.

2.1. Introduction.

A previous work by Jim H. Adams and coworkers "*The optimal arrangement of reflectors in solar panel tracker arrays*" originated from discussions with Graham Ennis who was in the process of designing PV panels with reflectors, also in the literature called solar concentrators. The present report arose from a specification by Will Cottrell of Brighton Energy Co-op, who had looked at that work and the reports of others using reflectors, and wanted to install reflectors for PV arrays on flat roofs.

The purpose of including calculations is twofold
(i) That computational errors may be detected and challenged.
(ii) That computations using other assumptions may be more easily developed.

2.1.1. The array and reflector design.

The central new idea in this paper is for a single reflector spanning a spaced array of PV panels, so that rays of light from the sun at different times of day always hit an array from a segment of the reflector that is not necessarily at right angles to a PV panel. This has various consequences.

(1) There is no interruption to the sunlight on a panel arising from discrete segments of the reflector, which may have negative implications on the output of the panel.

(2) The absence of reflectors at right angles to the sun's rays at sunrise and sunset means that there is no shadow due to the reflectors under a wide interval of the time of day.

(3) The only exception to a one reflector, one line of PV array, would be for the back array which could have an additional reflector at a different angle, since these PV arrays are sloped.

2.1.2. Technical summary.

On average about half of the light from the sun which reaches the ground reaches it directly and the other half comes from blue sky or clouds. Using this, we look at what the angle of a south facing solar panel should be. We find output is boosted by 10% for a panel at a 28° slope from the ground compared with a flat panel, for a panel at 35° the output is boosted by 9%, but at 44° by 1%. All these computations are for midday. Outside of midday, and for non south facing panels, the best slope is steeper than 28°.

2.1.3. Technical recommendations.