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**Rutgers Technology #:** 10-016



## Roof Peak Tilting/Tracking Solar Arrays

**Invention Summary:** For solar panel arrays, efficiency degrades as the angle of the sun's incidence changes. The use of solar tracking aims to remediate this problem by tracking the position of the sun in an attempt to maintain a near ideal perpendicular angle of incidence. Specifically, a solar tracker is a device for orienting a day lighting reflector, solar photovoltaic panel or concentrating solar reflector or lens toward the sun. The sun's position in the sky varies both with the seasons and time of day as the sun moves across the sky. Solar electricity-generating devices work most efficiently when the central rays of the sun strike the face of the solar electricity generating elements perpendicularly. Solar generating equipment works best when pointed at or near the sun, so a solar tracker can increase the effectiveness of such equipment (i.e., produce more energy) in comparison to operating such equipment in any fixed position. Solar panel mounting systems are available which include hardware to permanently affix the array to a roof, a pole, or the ground.

Currently, residential array installations are essentially all fixed arrays mounted on south-facing roof areas. This limits the solar panel market to only roofs with essentially east-west oriented roof crests. Researchers at Rutgers University have developed a method, device, and system that control the tilting of a solar panel to collect

the maximum power for the geometry of the roof that is involved. These movable solar arrays are capable of tracking movements through at least one degree rotational freedom to follow the movement of the sun at an optimal angle of array tilt. The present invention is aimed at residential installations on roofs that have substantially north-south oriented roof peaks by having a tiltable/tracking array mounted at the peak of the roof.

**Market Applications:** Residential solar panel installations on roofs that have substantially north-south oriented roofs

### **Advantages:**

- Tilting/tracking system for a solar array that may be mounted on the roof peak of a residential home that has a substantially north-south oriented roof peak.
- Produces the maximum power from the array relative to the geometry of the roof that it is mounted on.
- System provides improved solar energy collection for houses and buildings that have long been considered unsuitable for solar installations.

**Intellectual Property & Development Status:** Utility patent pending.