Single and Dual Axis Trackers

Trackers allow Photovoltaic panels to follow the sun from sunrise to sunset. Tracking increases power production from PV modules by 30% or more, depending on tracker configuration.

The position of the sun is calculated using a high precision astronomical algorithm. The Scorpius Tracker calculates the optimum rotation angle every minute.
The team of experts from Scorpius have a vast experience in astrophysics, mathematics, mechanical and civil engineering, materials, polymers etc. and can provide following:

**Services**

- **Plant Sizing**
  - Size optimization for Shading?
  - Use Back tracking?
  - Tracking for minimal increase (20%) in efficiency but lesser capex?
  - OR tracking for maximum increase in efficiency (35%) with max Capex?

- **Solar Technology**
  - Thin Film?
  - Mono Crystalline?
  - Poly Crystalline?
  - CPV?

- **Tracking Technology selection**
  - Single axis Horizontal Tracked
  - Single Axis Equatorial Tracked
  - Dual Axis pole mounted
  - Dual Axis tilt and roll

Optimal configuration is selected based on size and shape of available land, location and purpose of installation and PV technology selected.

**Energy Output over fixed PV**

>25%

**Increase in Capex per MW**

<10%

**Intelligent Tracking**

- GPS based system
- Back tracking
- Minimum power consumption
- No Bearings in Design
- Dust proof Tracking Mechanism
### Energy Generation Comparison

<table>
<thead>
<tr>
<th>Time</th>
<th>Single Axis Track</th>
<th>Flat Fixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:00</td>
<td>120</td>
<td>00</td>
</tr>
<tr>
<td>01:00</td>
<td>100</td>
<td>00</td>
</tr>
<tr>
<td>02:00</td>
<td>80</td>
<td>00</td>
</tr>
<tr>
<td>03:00</td>
<td>60</td>
<td>00</td>
</tr>
<tr>
<td>04:00</td>
<td>40</td>
<td>00</td>
</tr>
<tr>
<td>05:00</td>
<td>20</td>
<td>00</td>
</tr>
<tr>
<td>06:00</td>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>

- **Single Axis Track**
- **Flat Fixed**

### Economics

<table>
<thead>
<tr>
<th></th>
<th>Fixed PV</th>
<th>Scorpius Trackers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MW Cost</td>
<td>~ 9 Cr</td>
<td>~ 10 Cr</td>
</tr>
<tr>
<td>Power Generation (kW/Hr)</td>
<td>~ 15 lacs p.a</td>
<td>~ 18.5 lacs p.a</td>
</tr>
<tr>
<td>Per Unit (kW/Hr) Income</td>
<td>Rs. 8</td>
<td>Rs. 8</td>
</tr>
</tbody>
</table>

On Additional investment of: $18.5 - 15 = 3.5 \times 8 = ~ Rs. 28 lacs

---

### Hardware

We have developed a ‘no bearings, maintenance free, frictionless pivot’, the xFP-10, which replaces a bearing in our single axis tracking solution.

**Unique points of this product are:**

- No requirement of lubrication, for life of the plant (>40 years)
- Completely immune to dust.
- Zero wear and tear of mechanical parts.
- Since the mechanism is frictionless, very less force is required to move a tracker - which means that no external power source is required to move the panels - upto 150 KW can be moved using a 7Kg force.

Typically, in 1 MW, 800-1000 of the xFP-10’s will be required and will be supplied by us, accompanied by LIFETIME replacement guarantee.

### Software

**Our embedded system, tracking algorithms and drive / motor packs are unique because of following salient points:**

- In built ‘Back tracking’ algorithms, for maximizing plant load factor (CUF)
- ‘Turn on, forget it’ installation mode - in built GPS sensors, Real time clock, inclination sensors etc. to automatically calculate the solar position and panel position for any installation location and start tracking!
- Minimal rating motors, as the mechanical pivot developed by us is frictionless and hence requires minimal force for movement.
About Scorpius Trackers

Scorpius Trackers is promoted by the team at Chroma Systems and Chroma Energy

**Chroma Energy**
www.chromaenergy.in

Chroma Energy is the only company in India to have developed a complete Concentrator Photovoltaic (CPV) solution. The CPV solution from Chroma delivers modules with 28% AC efficiency with intelligent dual axis tracking.

**Chroma Systems**
www.chromasystems.com

Chroma Systems is a premier machine vision and Image Analysis company, with products lines in metallographic Image processing, hardness testing and CNC controllers. Chroma has the most number of installations of such products in India, with exports.