

**BACCALAURÉATS GÉNÉRAL ET TECHNOLOGIQUE
SESSION 2014**

**ÉPREUVE SPÉCIFIQUE MENTION « SECTION EUROPÉENNE OU DE LANGUE ORIENTALE »
Académies de Paris – Créteil – Versailles**

Anglais / STI2D enseignement transversal

Sujet n°5

Thème: Développement durable

Tracking a star to power a planet



Document 1 :

5 The global solar energy market's unprecedented growth has resulted in the twin challenges of delivering ever-higher performance and at the same time cutting generation costs. SKF has developed specific industry solutions that are designed to deliver lower total cost of ownership by providing a levelized cost of electricity through higher performance, lower maintenance requirements and longer product life.

Why solar tracking

10 Tracking systems are important features in efficient solar power generation as they help to increase the power output of photovoltaic panels – a dual-axis tracker can raise it by up to 40 % – and to fully capture the sun's radiation. To maximize energy generation, these systems need to have high performance characteristics such as robustness and accurate positioning, as well as providing a reliable solution capable of operating in harsh outdoor conditions. A solar tracking system has to track the sun with a certain accuracy depending on the technology. The various devices track the sun with accuracies reaching ± 0.1 degree. Hence, it is important to have drive systems without too much play, or "backlash". Otherwise, as the wind blows, the system will rock back and forth, either losing efficiency or not generating any power at all.

15 SKF offers globally all the drives and components needed for solar tracking applications with the added benefit that they are virtually maintenance-free. Electromechanical actuators, such as the Solar Linear Actuator and the Solar Hub, are used in tracking systems to move the solar panel in an east-west direction (called "azimuth" movement) or a north-south direction (called "elevation" movement), or both.

Benefits of solar tracking

Solar tracking systems increase efficiency or power output by up to 40 % by using a two-axis tracking system incorporating SKF Solar Hubs.

25 To minimize costs, it's important that the technology uses a solar tracking system that reduces the total cost of ownership through an easier and faster installation, minimizing maintenance intervals if not completely eliminating them, and through a reliable product that does not require field replacement or repair.

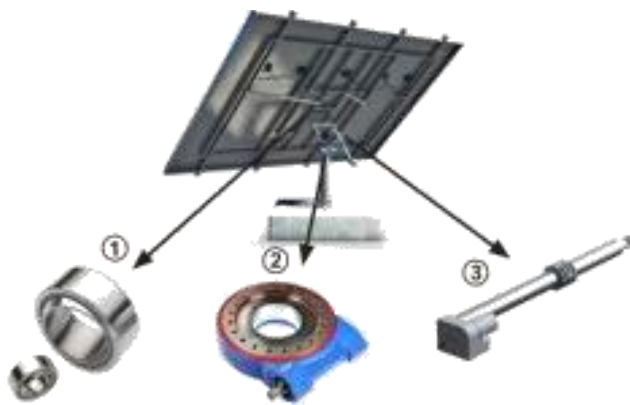
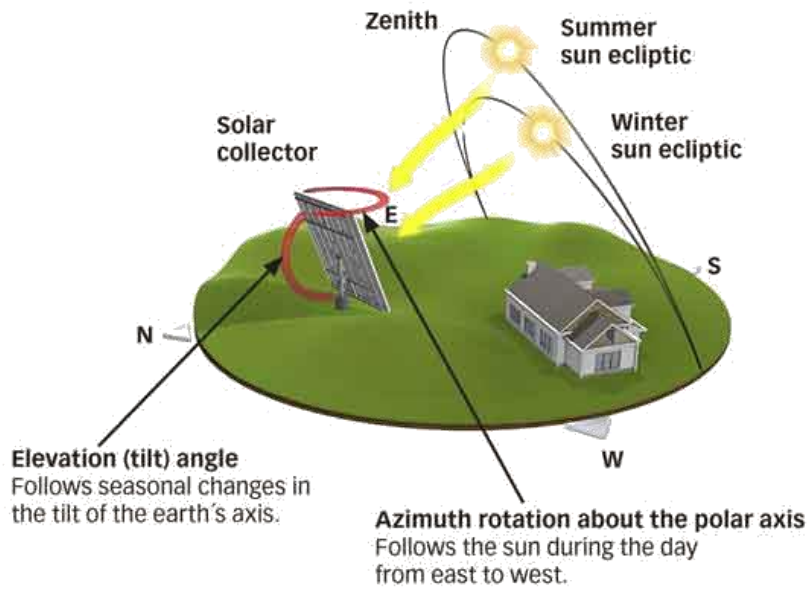
30 Solar equipment producers and operators alike can gain from working with SKF. By working in partnership, manufacturers gain the benefit of SKF's broad engineering design expertise and manufacturing efficiency. This can lead to improved quality and customer satisfaction while avoiding expensive warranty work. Operators experience lower solar system lifetime costs through more reliable systems that can generate more power for a longer duration.

Adapted from : Markus Behn, global business development manager, Solar Energy Segment, SKF GmbH, Langenhagen, Germany, solar@skf.com.

To make your presentation, you may use the following suggestions:

- 1) Explain how the production of energy is maximized in that system.
- 2) Compare the advantages and drawbacks of steady conventional solar panels and those described in document 1.

Document 2 :



- 1: Bearing
- 2: SKF Solar Hub
- 3: Solar Linear Actuator

Document 4 :

