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Three Ways

Solar Energy Production High

Efficiency Intelligent System

Budgetary Proposal 2018

BY M/S: JEMS COMPANY W.L.L, KINGDOM OF BAHRAIN BRANCH

FOR TECHNICAL & FINANCIAL CLARIFICATIONS CALL OUR PROJECT ENGINEER

M.R. JEHAN NATHAN; TEL: +973-17-874667; MOB: +973-39236574 (10AM TO 5PM)

ABOUT US:

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- ▶ **JEMS** is a fully integrated alternative solar & wind energy solutions provider, founded in 1988. Headquartered in South India and has around 15 years of solar industry experience.
- ▶ JEMS has supplied & installed small and large solar & wind energy production system EPC & IPP projects in South India.
- ▶ And we have started solar & wind energy production projects for residential, domestic, commercial & industrial EPC and IPP projects in Bahrain.
- ▶ We manufacture, assemble & provide solar project demo, pilot & prototype physical system for clients & customers approvals.

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OBJECTIVE

- ▶ The main objective of the solar energy production project in order to reduce the utilities energy bills and contribute to mitigation effort of Green Bahrain & Clean Bahrain from CO₂ emission free environment.
- ▶ The project encompass of two distinct phases:
 - ☑ The energy audit of the building and delivery improvement to ensure energy saving through integration of ON grid, OFF-grid and Hybrid solar & wind energy production system.
 - ☑ Energy cost saving through automation & occupancy systems.



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SUN TRACK SOLAR

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POWER PRODUCTION EFFICIENCY SYSTEM

Single Axis Sun Track System
Production Efficiency (40-70%)

Dual Axis Sun Track System
Production Efficiency (60-90%)



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INTRODUCTION

- ▶ EXTRACTING usable electricity from the sun was made possible by the discovery of the photoelectric effect.
- ▶ Subsequent development of the solar cells, which is a semi-conductive material that converts visible light into a DC direct current.
- ▶ Solar arrays, a series of solar cells electrically connected, generates a DC voltage which can be used on a load.
- ▶ For further optimization of these panels solar trackers are being implemented, which enhances the efficiency of panels by 30-35%.



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WHAT IS A SUN TRACK SOLAR SYSTEM ?

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- ▶ A **solar tracker** is a generic term used to describe devices that orient or align various payloads toward the sun by advanced technology based through GPS/GPRS.
- ▶ We can able to collect the **maximum solar energy**
- ▶ Example for payloads are photovoltaic panels, reflectors, collectors, lenses or other optical devices.
- ▶ The system focuses on the optimization of the electric energy produced by photovoltaic cells through the development of a sun-tracking system.



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Why Need Sun Track Solar System ?

- ▶ From dawn to dusk the sun keeps changing the angle from 0-90 degree rising and 90-180 degree declining.
- ▶ In a year of 365 days the sun moves approximately 22.5 degrees north to 22.5 degrees south of the equator.
- ▶ We get maximum energy from the sun when
 - The angle of the sun is degrees
 - The sun's position is 0 ± 5 degrees of the equator



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Continued....

- ▶ For the fluctuation factors mentioned previously, fixed solar panels does not give higher efficiencies more than 30%.
- ▶ A tracking system helps the solar panels keep oriented to the sun at the optimum possible angle together with the sun.
- ▶ The tracking systems improves the efficiency of energy production solar panels by 30% for single axis and an additional 20% for dual axis intelligent sun track system.



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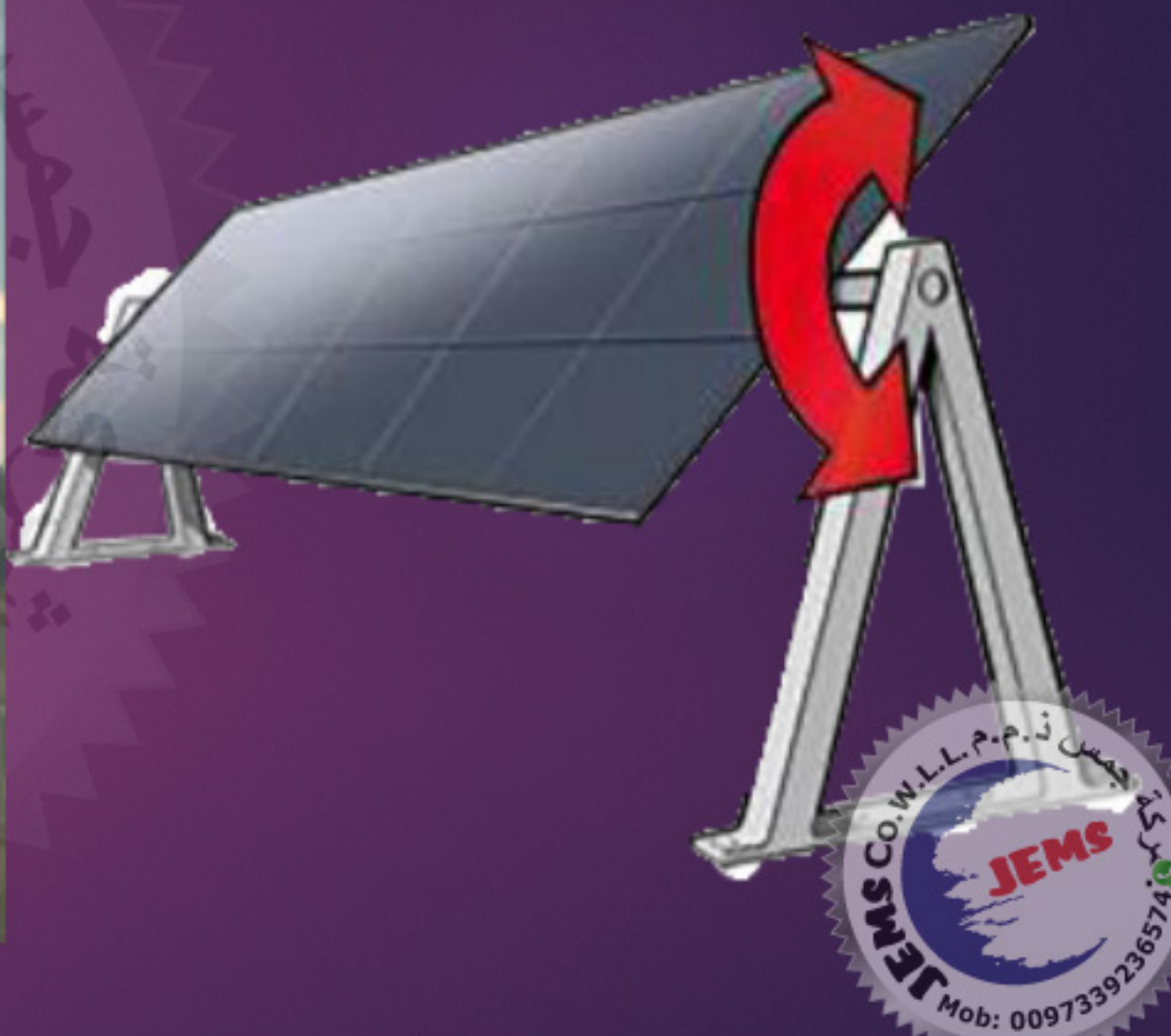
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SINGLE AXIS SUN TRACK SOLAR SYSTEM

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Single Axis Solar System in Kilowatts Energy Production (40-70%)



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Single Axis Solar System in Megawatts Energy Production (40-70%)



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Dual Axis Intelligent Sun Track Solar System

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- ▶ Dual axis solar tracker has two degrees of freedom that act as axes of rotation.
- ▶ It can rotate simultaneously in horizontal and vertical directions and able to point at the sun at all times by GPS/GPRS live connectivity with smart automation.
- ▶ Dual axis trackers track the sun both East to West and North to South for added power output (approx. 70%-90%) energy gain and convenience.



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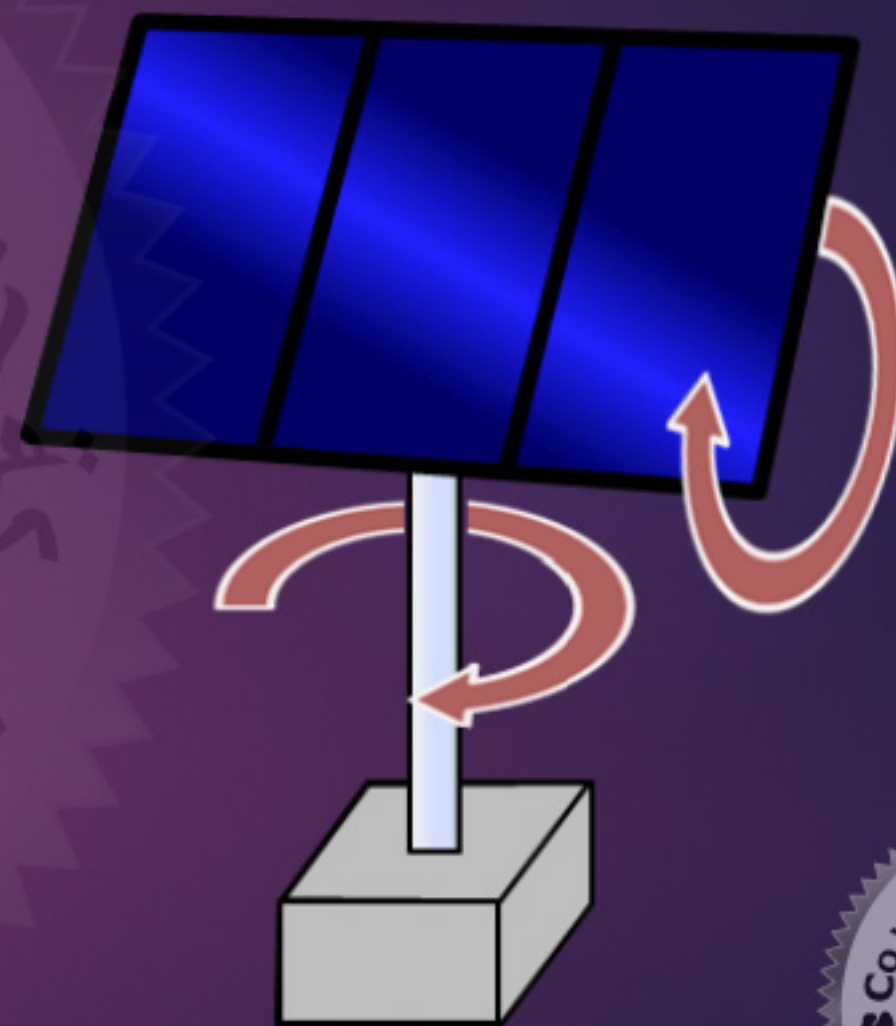
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DUAL AXIS SOLAR SYSTEM

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Dual Axis Intelligent Sun Track Solar Energy Production Stand Alone System (70-90%)

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Dual Axis Intelligent Sun Track Solar Energy Production (70-90%)

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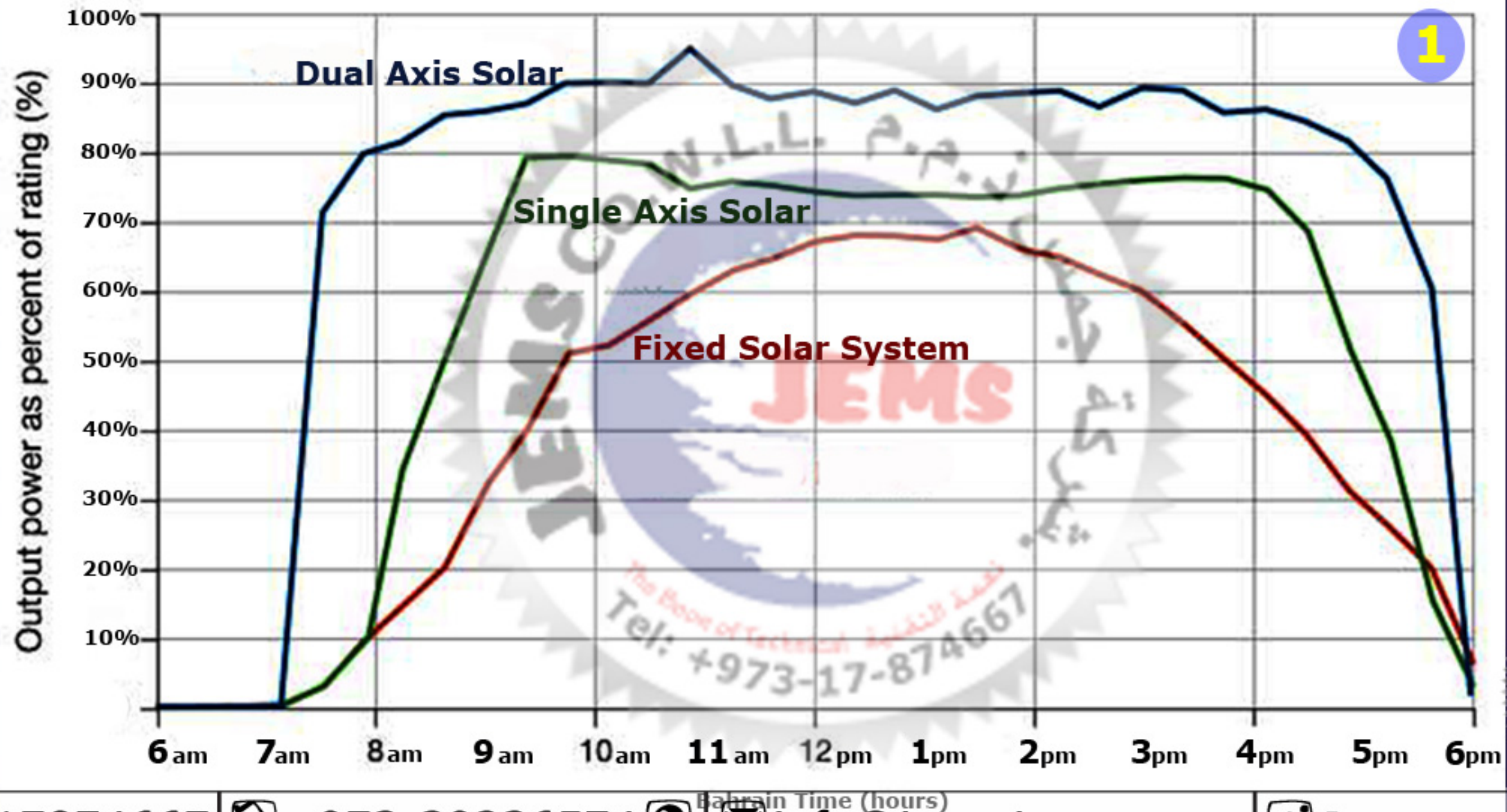
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Energy Production Efficiency Ratio Graph between Fixed Solar, Single Axis & Dual Axis System

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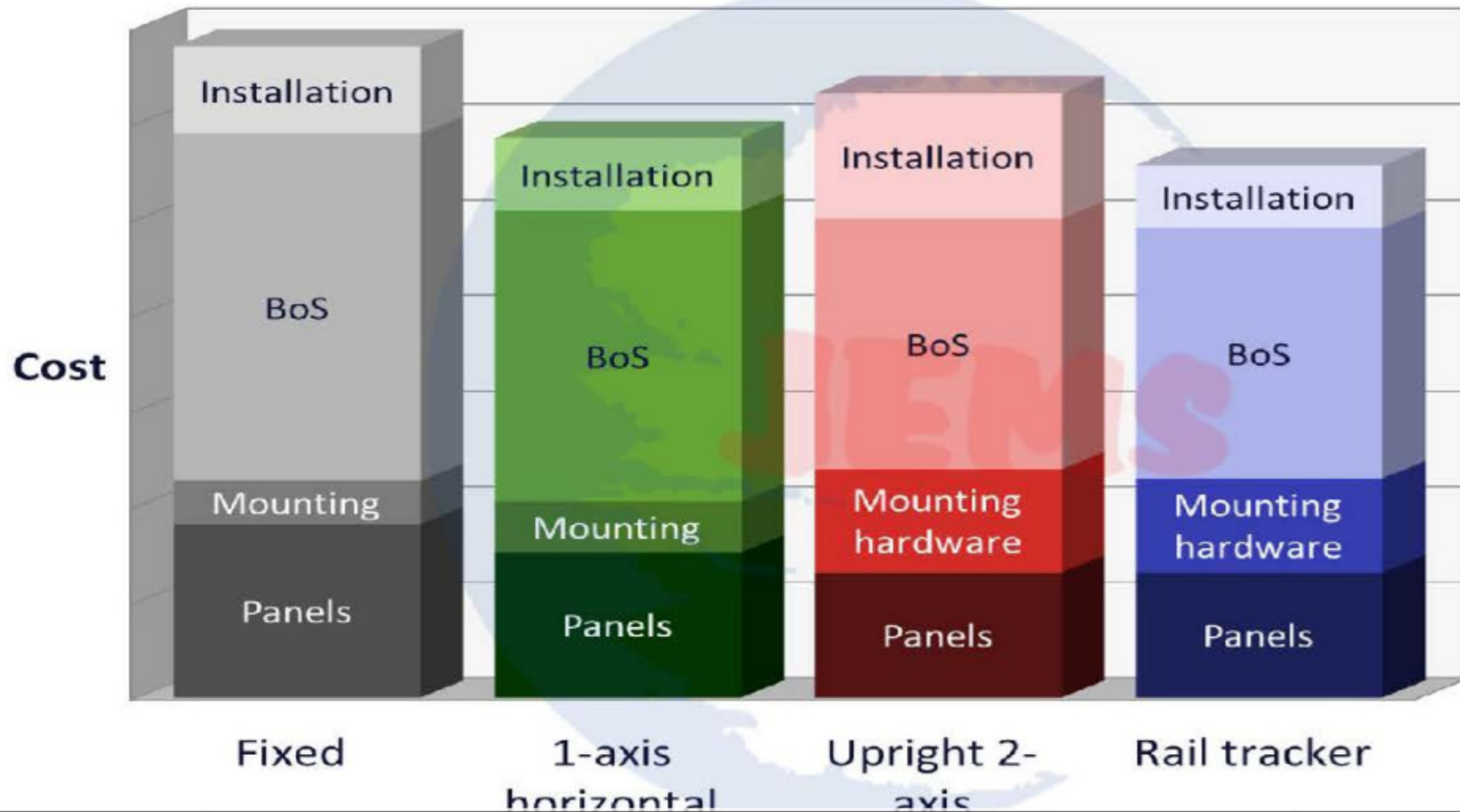


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Energy Production Cost Ratio Graph between Fixed Solar, Single Axis & Dual Axis SOLAR SYSTEM

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Automatic Solar Panel Cleaning System (Dry/Wet)

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THANK YOU

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