



CSP

ENERGY SYSTEMS Private Limited

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- **Concentrated Solar Power (CSP)** is dispatchable form of solar.
- Concentrated Solar Power (CSP) with Thermal Energy Storage (TES) uses fields of mirrors to focus sunlight onto a receiver, turning it into high intense heat. This high intense heat transfer with hot oil and heat energy stored in insulated tanks using with sand.
- Manufacturing of Concentrated Solar Thermal Energy Systems for various sectors like Domestic, Commercial and Industries.
- Square Parabolic Reflecting Mirror Dish Concentrator with Dual Base and Dual Access Tracking system

Description of Parabolic Dish:

The Square Parabolic Solar Concentrator (Solar Dish) continuously tracks the sun throughout the day using a dual-axis tracker enabling the system to harvest maximum solar energy from early sunrise to late sunset. Most solar concentrator tracking technologies use an actuator for vertical tracking. The solar concentrator uses a slew drive instead of an actuator for rock-solid reliability and more accurate control of the movement. Regardless of the season or latitude, the solar concentrator maintains 0.1 degree sun lock accuracy.

As the solar concentrators follows the sun, the sun's solar energy shines onto the collector, which has a highly reflective surface, and reflects the concentrated solar power onto a receiver at a magnification of 1000X.

The advantage of a Square Parabolic Dish Solar Concentrator is that it can provide solar thermal power.



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How It Works:

- ❖ **Sun Tracking:** Large mirrors called heliostats or troughs follow the sun and focus light onto a central receiver.
- ❖ **Heat Transfer:** A fluid (like molten salt or synthetic oil) flows through the receiver and absorbs high temperatures.
- ❖ **Storage:** Hot fluid moves into insulated storage tanks, until power needed.
- ❖ **Generation:** Stored heat boils water into steam to turn a turbine and make electricity.

Thermal Energy Storage Systems Operate through scientific mechanism.

- Thermal Energy Storage (TES) captures excess heat or cold in a storage medium during low-cost or surplus energy periods (like at night or during high solar generation). It holds that energy in insulated containers or geological structures and releases it later for heating, cooling, or power generation when demand peaks.
- a) **Sensible Heat Storage:** Absorbs or releases heat by raising or lowering the temperature of a solid or liquid medium (such as hot oil, water, sand, rocks, or molten salts) without changing its phase).

Renewal energy are typically CSP Energy, Conventional Solar Energy, Hydro Power, Wind Power and Ocean Waves Energy.

Why we choose CSP Energy..

- All renewal energies should be depends on sun thermal power. As well as its plentifully available in nature.
- CSP generates Solar thermal power 1000W per hour in one square meter.

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Example:

As generally domestic consumption will be 300 to 400 units per month and it's reflecting 400kW. In Thermal Energy generates 300 to 360kW per month in the space of 2square meter.

We are going to achieve CSP thermal energy systems efficiency upto 80 to 95% with our new products and in electricity generation also going to achieve 50 to 70% efficiency.

Products:

- ❖ Concentrated Solar Power Hot Air Dryers.
- ❖ Concentrated Solar Power Hot Water System.
- ❖ Concentrated Solar Power Steam Boiler.
- ❖ Concentrated Solar Power Chiller (Air Conditioner) System.
- ❖ Concentrated Solar Power Thermal Energy to Electric Power Energy Generating System.
- ❖ Concentrated Solar Power Thermal Energy Storage System.
- ❖ All Agriculture related Drying Equipments with Concentrated Solar Power.
- ❖ Align with existing systems for enhance quality power supply and reduce Fossil Fuels consumption.

Note: Above all products available with and without Thermal Energy Storage System.

CSP energy utilized sectors and Products as following..

For Agriculture:

1. CSP Air Dryers.

For Industrial:

1. CSP Hot Water System.
2. CSP Boiler
3. CSP Chiller.
4. CSP Power Generator.

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5. CSP Terminal Storage System.

For Commercial:

1. CSP Hot Water System.
2. CSP Cocker.
3. CSP Stove.
4. CSP AC.
5. CSP Power Generator.
6. CSP Terminal Storage.
7. CSP EV Charging Stations.
8. CSP Desalination System.

Benefits of Thermal Energy System.

It is very cost effective comparative to electrical energy storage system.

Key Benefits:

- **Power at Night:** Unlike standard solar panels, CSP provides electricity after sunset and on cloudy days.
- **Low Cost Storage:** Storing energy as heat in tanks is much cheaper than storing large amounts of electricity in chemical batteries.
- **Stable Grid Support:** It acts like a traditional power plant to supply steady, reliable energy when demand is high.
- Reduced fossil (Conventional) fuel consumption.
- Avoid Conventional Fuel price volatility (inconsistency).
- Neutralize Conventional fuel cost inflation.
- Generate carbon credits.

Conclusion:

Solar Thermal Energy presents a compelling option for transitioning to a cleaner and more sustainable energy future. Its advantages, such as renewable power generation, reduced emissions, and energy storage capabilities, make it an attractive

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alternative to fossil fuels. However, challenges like intermittency, high initial costs, and land use requirements should be carefully addressed. But, we are addressing to resolved above challenges with our new invention.

As technology continues to advance and awareness of environmental concerns grows, solar thermal energy is poised to play a significant role in our energy mix. By capitalizing on its potential and addressing its limitations, we can pave the way for a greener and brighter future for generations to come.

How a Solar Concentrator Works With Thermal Fluid Heating.?

In solar power plant applications that utilize the high temperature heat such as ORC (Organic Rankine Cycle), a circulating pump circulates the thermal fluid through the absorber and the sun's solar concentrated power heats up the fluid as it passes through.

The hot thermal fluid is circulated via a pump to a primary heat exchanger that transfers the thermal energy produced from the solar concentrator to the various applications. The cooled water is then re-circulated back to the absorber where it starts the heating process again.

SQUARE PARABOLIC DISH SYSTEMS

A Parabolic dish system consists of a parabolic-shaped point focus concentrator in the form of a dish that reflects solar radiation onto a receiver mounted at the focal point. These concentrators are mounted on a structure with a two-axis tracking system to follow the sun. The collected heat is typically utilized directly by a heat engine mounted on the receiver moving with the dish structure. Stirling and Brayton cycle engines are currently favored for power conversion.

Why choose our Products (Unique Selling Proposition)

- We provide high and superior quality of material.

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- Offering the lowest price in the market. But, in the market likewise products are not available. Mostly higher size of the products only available. But we come with Skid size products to Larger Size products like tailor-made consider for all sections in domestic, commercial and Industrial.
- Faster delivering tailor-made products than anyone else and fastest response for customer support with our expert technical Team.

Market Fit and Research

- **Find real needs:** As we found challenges from Solar, Wind and battery charging modes not support for all day including night time and after sunset power will not generated. Even no sun day also facing same issue. We addressed above issues and overcome painful issues with our new invention products.
- India's total installed solar capacity reached 164.59 GW target of 500GW by 2030. Domestic solar consumption is expanding rapidly and accelerated with our CPS system in domestic, commercial and Industrial.
- CSP Thermal system is more advanced, safest and there is no direct or indirect pollution takes place. We promise our product resolves a painful challenges with existing system.
- **As we found that no similar competitive products are available in the market and we provide tailor-made features, cheapest and the best in quality products.**

Revenue Generation: Pricing and Models

- We target revenue generation in the market involve aligning systematically convert market demand into predictable top-line income.
- Focus marketing efforts on high-value customer segments most likely to buy and retain.
- Communicate unique solutions to specific customer pain points clearly.

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- Build a steady pipeline of inbound interest through content, and targeted outreach.
- **We built with skid type version products and it avoids spending big money with more our product efficiency. Explain how this product unmatched with other's in the market. One time purchase.. No pain forever.**
- **We set Value-Based Pricing** based on perceived customer value rather than just production costs.
- Offer multiple product or service tiers to capture different budget levels.
- **Recurring Models** offers shift one-time purchases into subscription or retainer models for stable cash flow.
- We provide customised purchase plans for the customised products to the customer at the lesser price along with payment flexibility with banks and other financial sectors.
- We will guide the customer possible government schemes and subsidies towards extended our business opportunities in the market and shows benefit the customer.
- We will balance profit goals with what customers are willing to pay.
- Bundle features or offer tiered levels to encourage higher spending (up-selling)

Market Positioning, Sales and Launch Execution

- **We Align teams** to make sure our Marketing and Sales groups share the same launch goals. Focus marketing efforts on high-value customer segments most likely to buy and retain.
- **Target the right audience:** for that we focus ads and messages in various platforms on the specific buyers who need the product the most and even we educate why needed.
- Communicate unique solutions to specific customer pain points clearly.
- Build a steady pipeline of inbound interest through content and targeted outreach.
- Map out distinct stages from lead qualification to closed deal.

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- Simplify the final purchasing path to reduce drop-offs.
- Offer complementary add-ons at or immediately after the point of sale.
- **Track Results:** Watch key numbers like sales volume and customer value to fix weak spots quickly and increase the awareness of the product.
- Performance monitoring vital signs like Customer Acquisition Cost (CAC) and Customer Lifetime Value (CLV).
- Optimise analyse shift marketing and sales budgets toward the highest-returning channels.
- **Keep customer success integration of** existing buyers happy to minimize churn and maximize long-term yield.
- **Target repeat engagement** of former and active buyers with personalized retention campaigns.
- Incentivize current clients to bring in new organic leads with existing customers.
- **Smart Metering:** Implementing the Revamped Distribution Sector Scheme (RDSS) infrastructure minimizes Aggregate Technical & Commercial (AT&C) losses for immediate cash flow recovery.
- **EV Charging Networks:** CSP Power Generator with Thermal Storage System addressing commercial electric vehicle charging infrastructure creates consumer facing retail energy revenue streams.

Pros of Solar Thermal Energy:

1. **Renewable and Sustainable:** One of the most significant advantages of solar thermal energy is that it relies on an infinite and clean source of energy is the sun. As long as the sun shines, we can harness its power without depleting natural resources or contributing to harmful emissions.
2. **Reduced Greenhouse Gas Emissions:** Unlike conventional fossil fuel-based power plants, solar thermal energy facilities produce

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little to no greenhouse gas emissions during their operation. By transitioning to solar thermal power, we can mitigate the impacts of climate change and reduce our carbon footprint.

3. **Energy Storage Capabilities:** Advanced solar thermal technologies, such as molten salt storage, allow for the storage of excess heat generated during peak sunlight hours. This stored heat can be used later to produce electricity, ensuring a continuous power supply even during cloudy periods or at night.
4. **Diverse Applications:** Solar thermal energy can be used for various applications, including electricity generation, water heating for residential and industrial use, and space heating and cooling. Its versatility makes it suitable for both large-scale power plants and small-scale residential systems.
5. **Local Job Creation:** The deployment of solar thermal energy projects creates employment opportunities in local communities. From construction and installation to operation and maintenance, these projects contribute to job growth and economic development.
6. **Low Operating Costs:** Once a solar thermal power plant is up and running, its operating costs are relatively low compared to traditional fossil fuel power plants. This cost advantage is especially evident in regions with abundant sunlight.
7. **Scalability:** Solar thermal energy projects can be easily scaled up or down based on energy demand, making it a flexible solution that can adapt to changing needs.
8. **Long Lifespan:** Solar thermal power plants have a long lifespan, typically lasting 20 to 30 years or more with proper maintenance. This ensures a stable and reliable energy source over an extended period.

Cons of Solar Thermal Energy:

1. **Intermittency and Weather Dependence:** One of the main challenges of solar thermal energy is its dependence on weather conditions. Cloudy days and night time significantly reduce power generation, necessitating energy storage solutions or backup power sources.



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2. **Land Use and Environmental Impact:** Large-scale solar thermal power plants require significant land areas, potentially leading to habitat disruption and land use conflicts. Additionally, the construction and operation of these facilities may have localized environmental impacts.
3. **High Capital Costs:** The initial investment required for setting up solar thermal power plants can be substantial. While operating costs are low, the high upfront expenses can be a barrier to widespread adoption.
4. **Water Consumption:** Some solar thermal technologies, such as parabolic trough systems, consume water for cooling. In regions with water scarcity, this can pose challenges and compete with other water needs.
5. **Transmission and Infrastructure:** Remote locations with abundant sunlight may require extensive transmission infrastructure to deliver power to urban centers. Building this infrastructure can be costly and time-consuming.
6. **Technology Limitations:** Certain solar thermal technologies are still in the early stages of development and face technological limitations. Advancements are needed to enhance efficiency and reduce costs further.

Conclusion:

Solar Thermal Energy presents a compelling option for transitioning to a cleaner and more sustainable energy future. Its advantages, such as renewable power generation, reduced emissions, and energy storage capabilities, make it an attractive alternative to fossil fuels. However, challenges like intermittency, high initial costs, and land use requirements should be carefully addressed. But, we are addressing to resolved above challenges with our new invention.

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