SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
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DEPARTMENT OF MECHANICAL ENGINEERING

19MEZ402 SOLAR PHOTO VOLTAICS FUNDAMENTALS AND TECHNOLOGY

UNIT 3 – GRID CONNECTED PV SYSTEMS

TOPIC –SOLAR POWER PLANT

pxfuel.com

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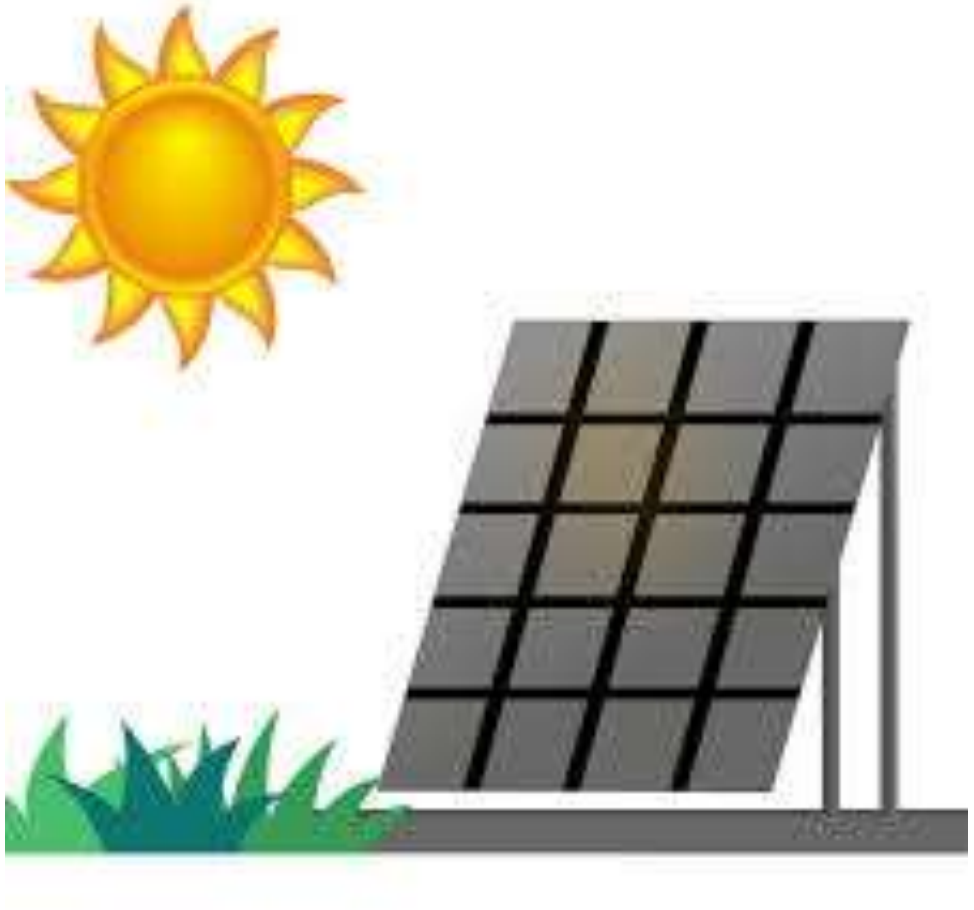
- Sun as energy
- Sun radiation into electricity
- **Our Topic is Solar Power Plant**

Solar Energy



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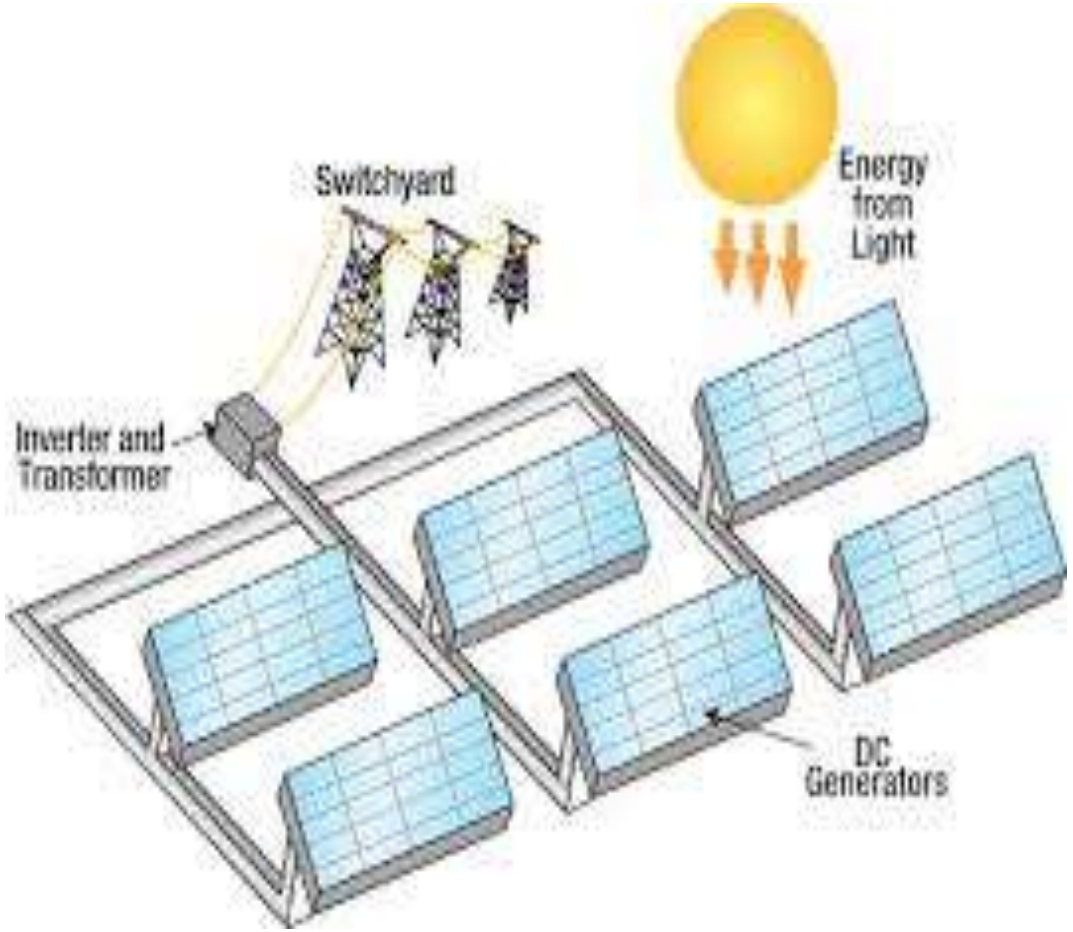
- Sunrays are in the form of radiation
- Converted into Heat energy
- Transform solar radiation into heat
- Solar energy can be directly converted into electricity
- Photovoltaic cells or by indirect method
- Increasing cost of fossil fuels and pollution

Solar Power Plants



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Major technologies in solar power plants

- Concentrated Solar Power Plant
- Thermal Solar Power Plant
- Photo-voltaic Solar Power Plant

Concentrated Solar Power Plants

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- Lenses and mirrors
- Tracking systems
- Focus on a large area
- sunlight into a small beam
- Steam is generated
- Conventional steam turbines
- Power generating

Thermal Solar Power Plants

https://kenbrooksolar.com

- Heat dependent solar technology
- Sun rays are focused to a point
- Solar collectors are used
- High temperature to generate
- Generates electricity

Photo-voltaic Solar Power Plant

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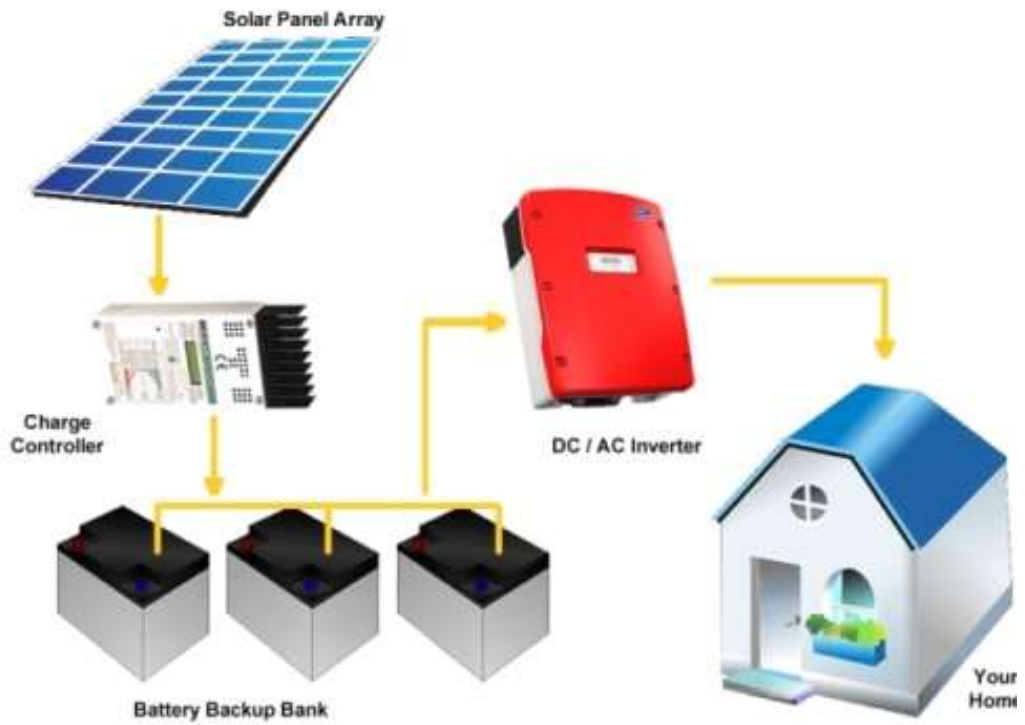
- Solar cells
- Photo-voltaic principle
- Light energy into electrical energy
- Solar panels are used

Off grid solar power plant



- System with battery bank
- Unconsumed power in batteries
- Solar inverter
- Convert DC electrical current coming from the batteries into AC
- Store Electricity
- Common household appliances

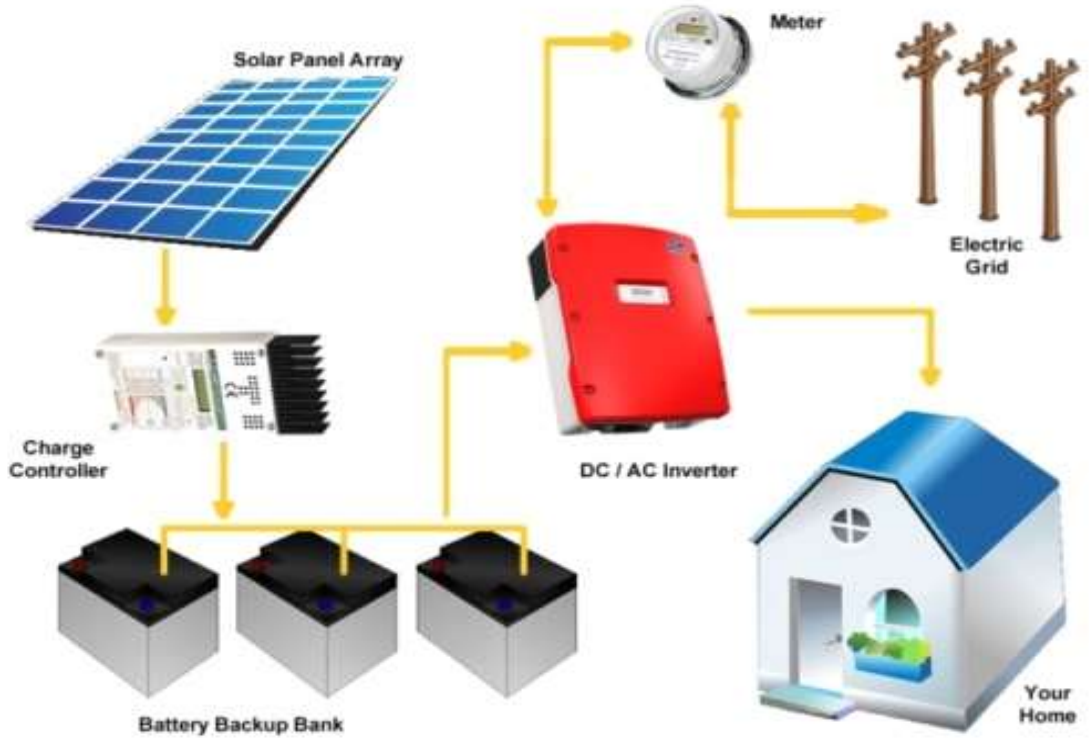
https://kenbrooksolar.com

On grid systems

https://kenbrooksolar.com

- Utility power grid
- Generates Electricity
- Connect to the grid
- Perform its functions
- Overproducing.
- Automatically send excess power
- Net metering system

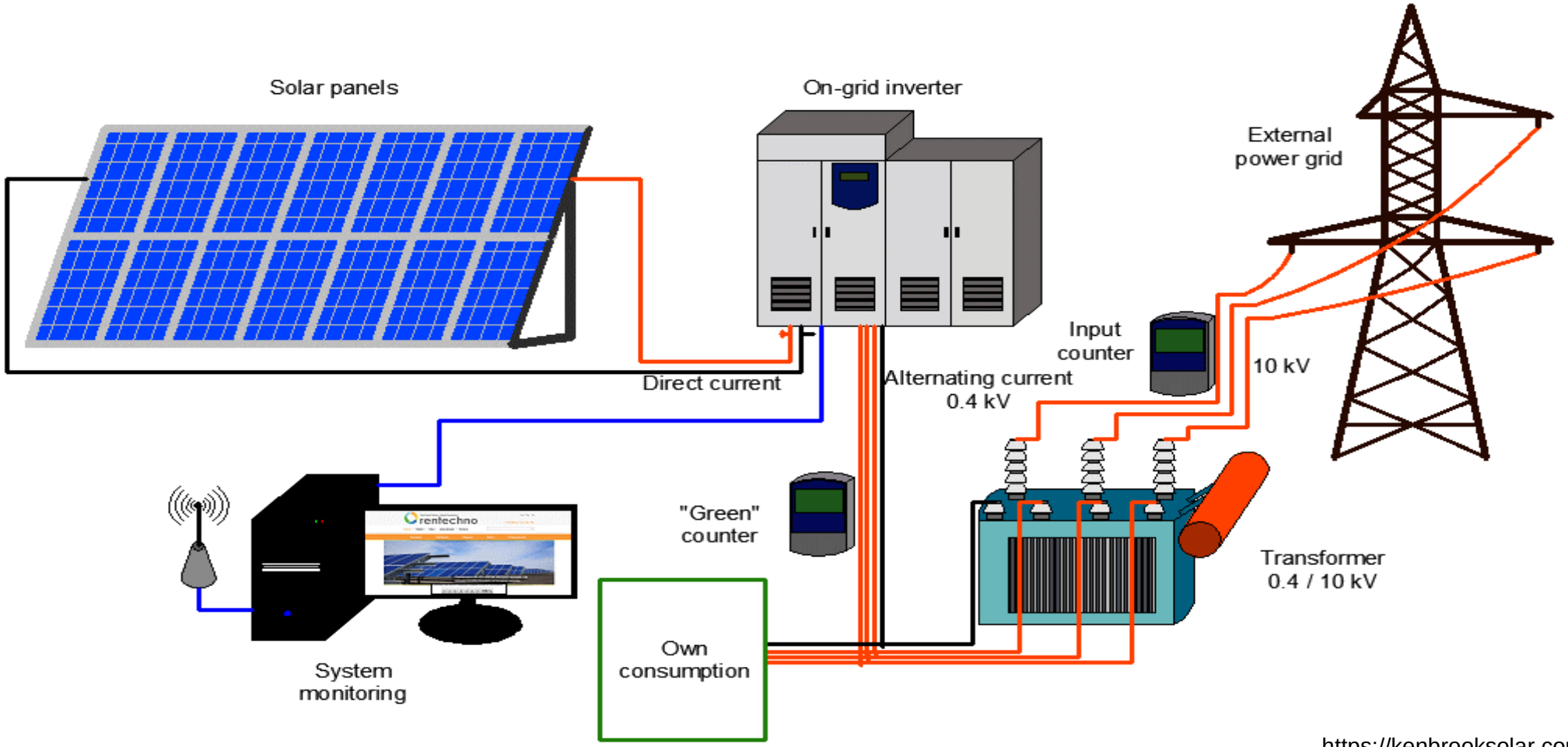
Hybrid Solar Power Plant



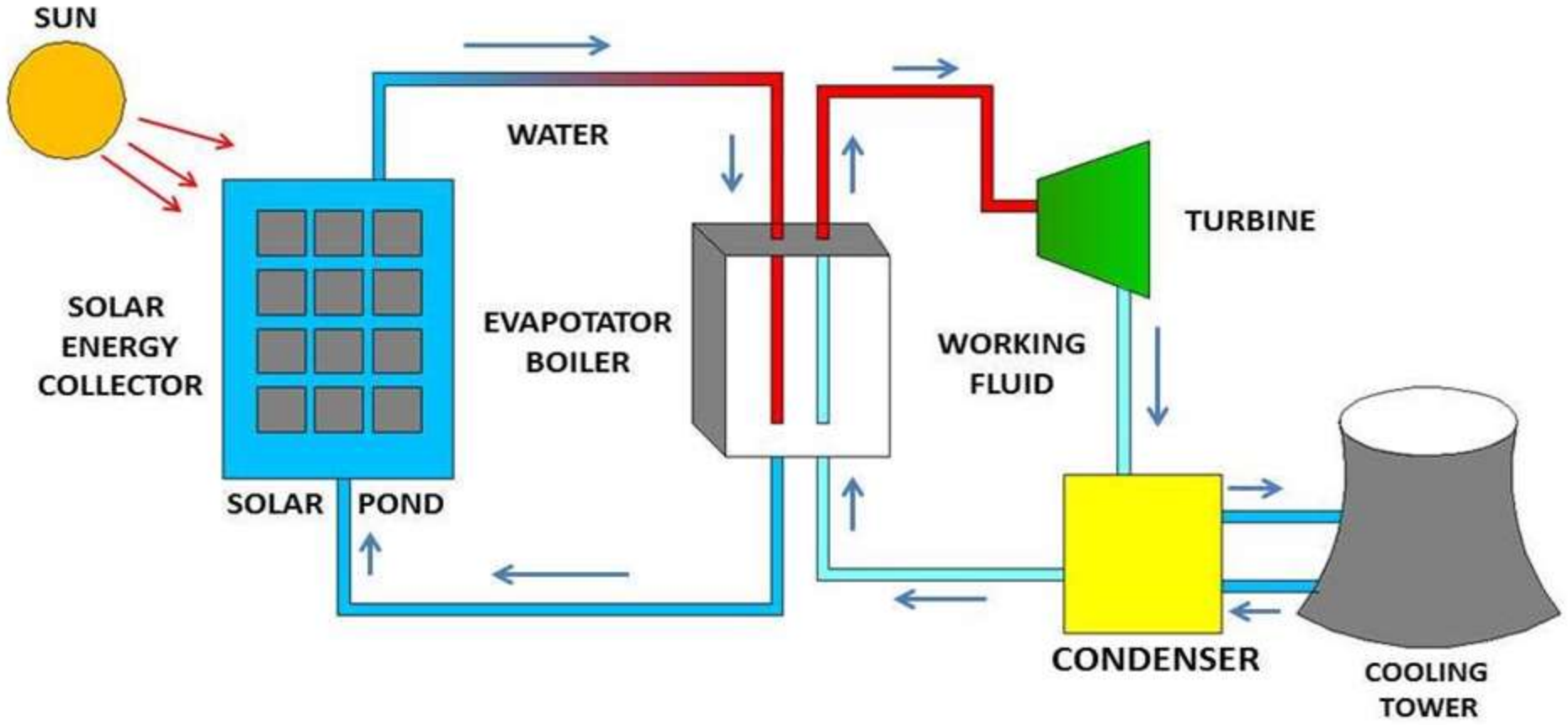
- On grid solar system and off grid solar system
- Power is stored
- Exports power

https://kenbrooksolar.com

Ground Mounted Power Plant



Solar Thermal Power Plant



https://www.mech4study.com/

Main Parts

- Solar pond- Solar Energy is absorbed
- Solar energy collectors-solar radiations collected
- Working fluid- Brine/evaporate easily
- Boiler-Steam is produced
- Turbine and Generator-Electrical energy is produced
- Condenser and Cooling tower-Condensation process

Advantages

Nellis.af.mil

- Abundant on the earth surface
- No Pollution
- Free of cost
- Returns are more
- Renewable energy.

ASSESSMENT-1

1.Most of the solar radiation received on earth surface lies within the range of.....

(A) 0.2 to 0.4 microns

(B) 0.38 to 0.78 microns

(C) 0 to 0.38 microns

(D) 0.5 to 0.8 microns

2.Reflecting mirrors used for exploiting solar energy are called.....

(A) Mantle

(B) Ponds

(C) Diffusers

(D) Heliostats

ASSESSMENT-1

3. Hybrid solar power is a suited for

(A) On grid

(B) Off grid

(C) On grid and Off grid

(D) All of the above

4. Invertors are used for

(A) DC to AC current

(B) AC to DC Current

(C) Save energy

(D) Increase the voltage

ASSESSMENT-1

5.In concentrated solar power plant the temperature is _____compared to other power plant.

(A) Higher

(B) lower

(C) Equal

(D) Higher or lower

References

- https://kenbrooksolar.com/solar-power-plants
- https://www.mech4study.com/2018/09/how-a-solar-power-plant-works-and-what-are-main-types-of-it.html