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# Towards Green Energy

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Grade 10

# Watch

<https://www.youtube.com/watch?v=GRDE20aVkJI>

<https://www.youtube.com/watch?v=SyFRYm7VSDo&t=543s>

<https://www.youtube.com/watch?v=Rbf6lyAEnyU&t=2s>



**Give a flow chart showing generation of electrical energy.**



**5.4 Flow chart showing generation of electrical energy**

**What is meant by green energy? Which energy sources can be called green energy sources and why? Give examples.**

**Answer:** Green energy is that energy which does not pollute the environment and is renewable in nature. The energy sources such as sunlight, wind, rain, tides, etc. can be called as green energy. This is because these are readily available on Earth, can be naturally replenished and do not even harm the environment much.



**Draw neat and labelled diagrams.**

**a. Energy transformation in solar thermal electric energy generation.**

The reflectors/ concentrators concentrate the solar radiations on the absorbers.



Absorbers absorb the radiations and convert them to heat energy.



The turbine drives the generation of electricity by the generator.



This heat energy is used to produce steam which runs the turbine.

Thermal energy in radiation → Kinetic energy in steam → Kinetic energy in turbine → Electrical energy

# Advantages & Disadvantages of Solar Energy



## **Advantages of solar energy:**

- Solar energy is green energy i.e. it is renewable and does not cause pollution.
- Solar panels for the generation of electricity requires less maintenance.
- With the help of solar energy, electricity is possible to be generated even in the most remote, inaccessible locations where electric power lines cannot be laid.

## **Limitations of solar energy:**

- Electricity generation based on solar energy is weather dependent and hence it is less reliable. In winters and in cloudy days, the production becomes less.
- The whole set-up of the panels requires lot of space to generate considerable amount of electricity.
- The initial cost of a solar panel is sufficiently high.



# Conventional & Non- Conventional sources of energy

| Conventional sources of energy                                | Non-conventional sources of energy                       |
|---|--|
| They are exhaustible.   | They are inexhaustible                                   |
| They cause pollution.   | They do not cause pollution.                             |
| Not Eco friendly energy                                       | Eco-friendly energy                                      |
| Energy obtain costlier than non-conventional source of energy | Energy obtain cheaper than conventional source of energy |
| Non-renewable energy  | Renewable energy   |
| eg: coal, petroleum, natural                                  | eg: wind energy, solar energy                            |

**Which type/types of power generation involve maximum number of steps of energy conversion? In which power generation is the number minimum?**

**Answer**

The steps of energy conversion are maximum in thermal power generation:

(i) Thermal energy based power generation: It involves 5 steps of energy conversion.

Fuel Energy → thermal energy → kinetic energy in steam → kinetic energy in turbine → electrical energy

(ii) The power generation using solar photovoltaic cell & wind turbine involves minimum number of steps for energy conversion