

Geothermal Energy

--- a renewable energy source for electricity generation ---

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Outlines

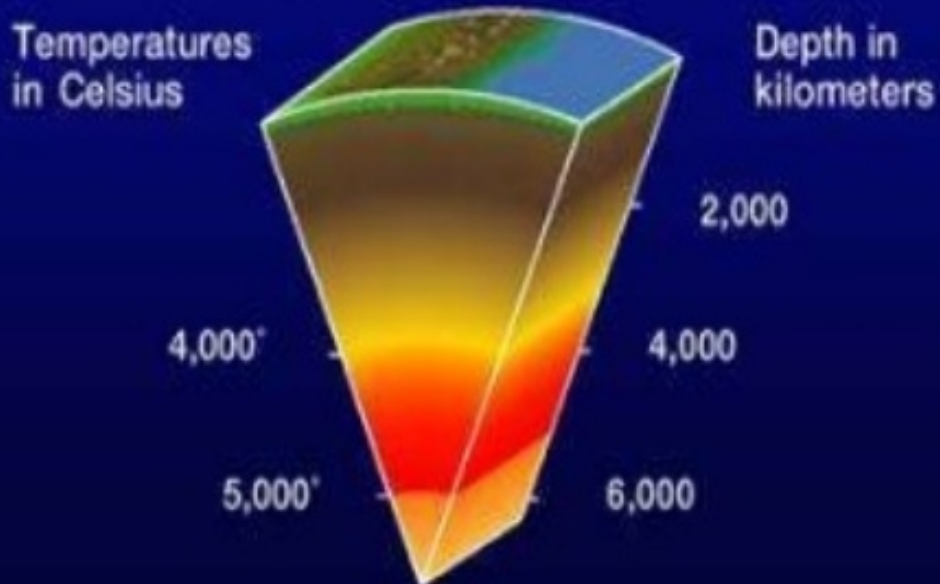
- Introduction
- Geothermal Reservoirs
- Extraction & Uses of Geothermal Energy
- Electricity Generation
- Cost
- Geothermal Energy in India
- Pros and Cons
- Conclusion

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Introduction

What is Geothermal Energy ?

Temperatures in the Earth



The deeper you go, the hotter it is !!!

It's simply the heat energy of the earth, generated by various natural processes, such as:

1. heat from when the planet formed and accreted, which has not yet been lost
2. decay of radioactive elements
3. friction

etc.....

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Geothermal Reservoirs

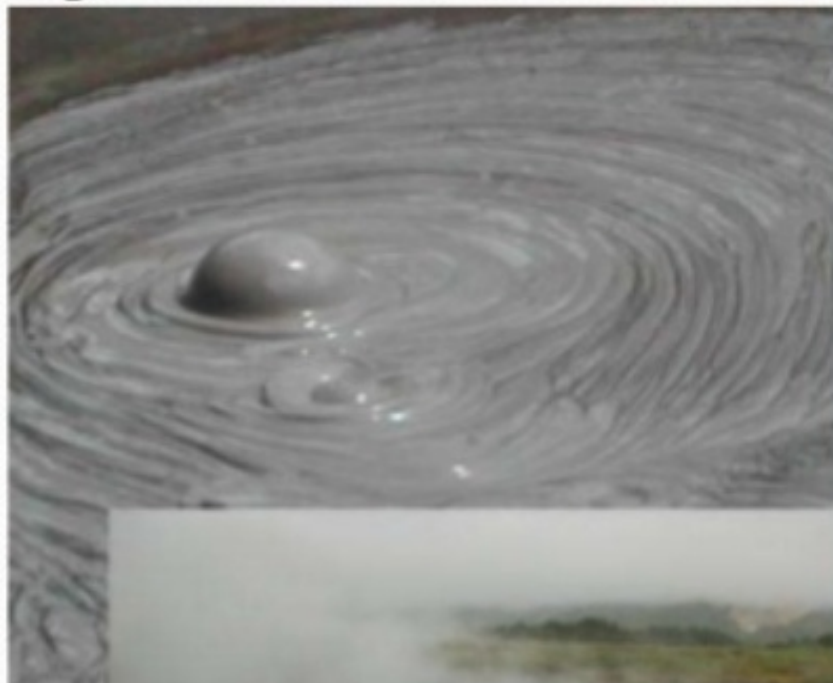
- Reservoirs can be suspected in the areas where we find :-

→ Geyser

→ Boiling mud pot

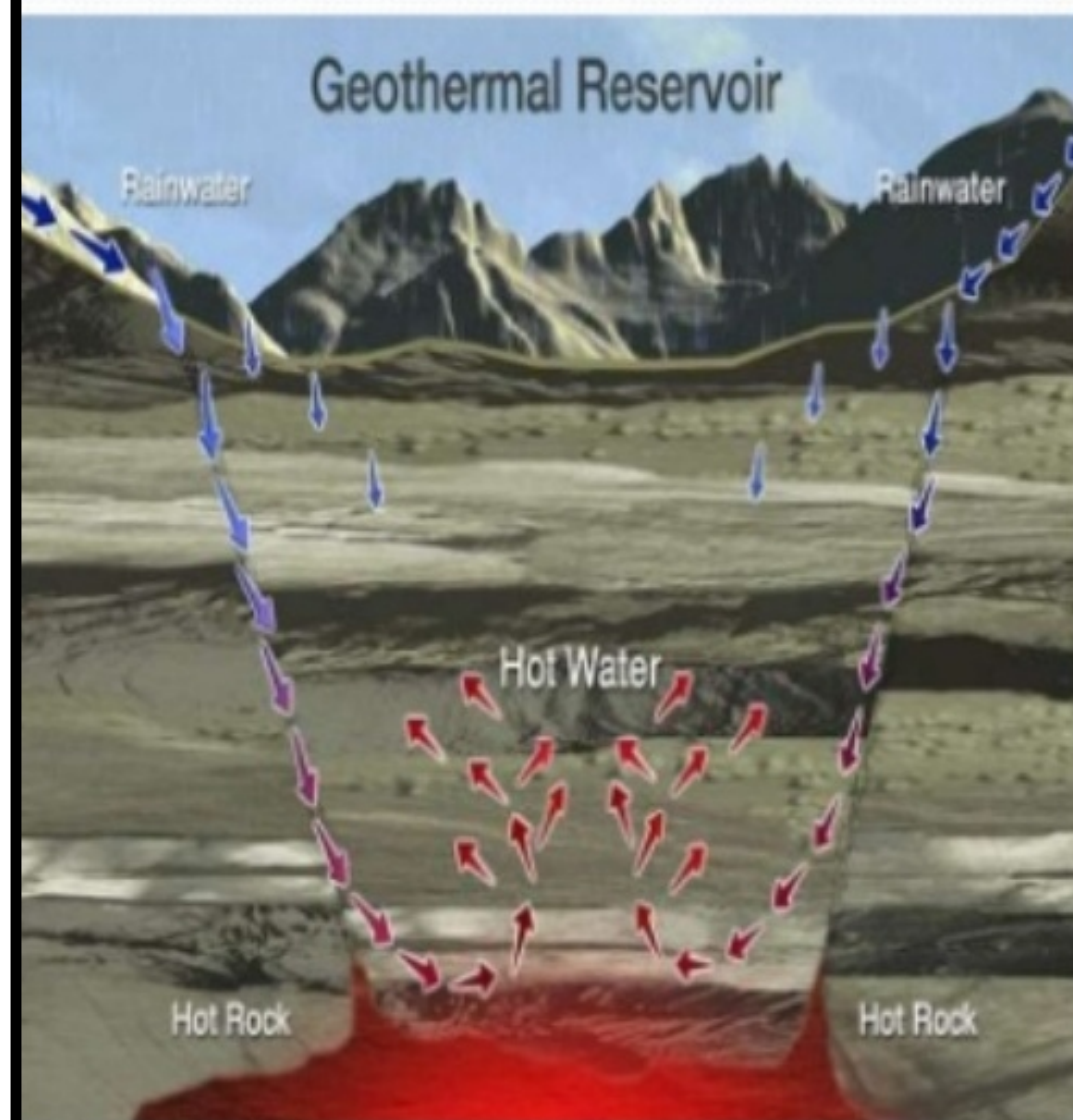
→ Volcano

→ Hot springs



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Geothermal Reservoirs (cont.)



- The rising hot water & steam is trapped in permeable & porous rocks to form a geothermal reservoir.
- Reservoirs can be discovered by
 - testing the soil
 - analyzing underground temperature

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Extraction & uses

- The heat energy can be brought to earth surface by following ways..
 - directly from hot springs/ geysers
 - geothermal heat pump
- Uses are broadly classified as:-
 - direct use
 - indirect use

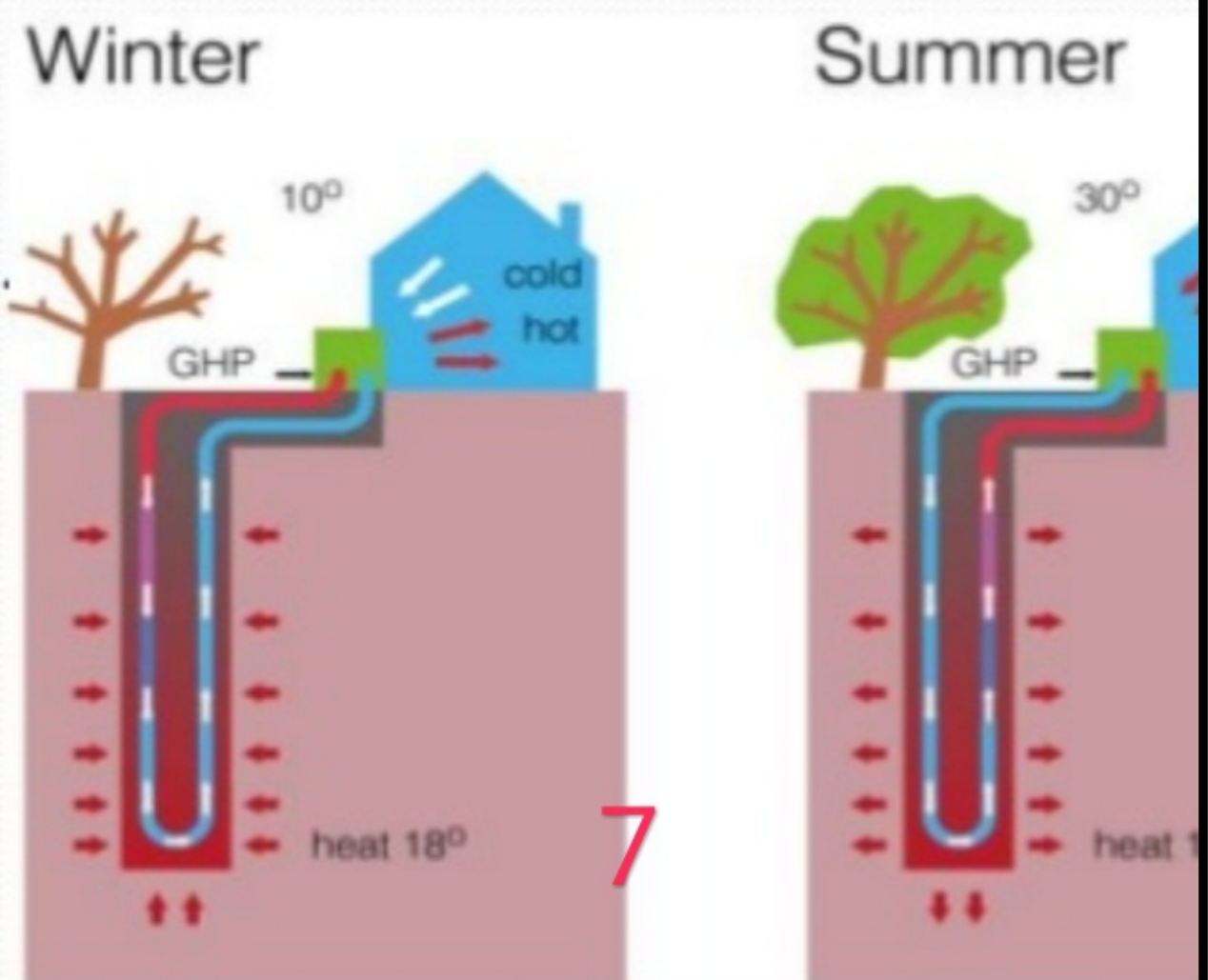
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Heating water at fish farms.

Provide heat for buildings.

Raising plants in greenhouses,
drying crops.

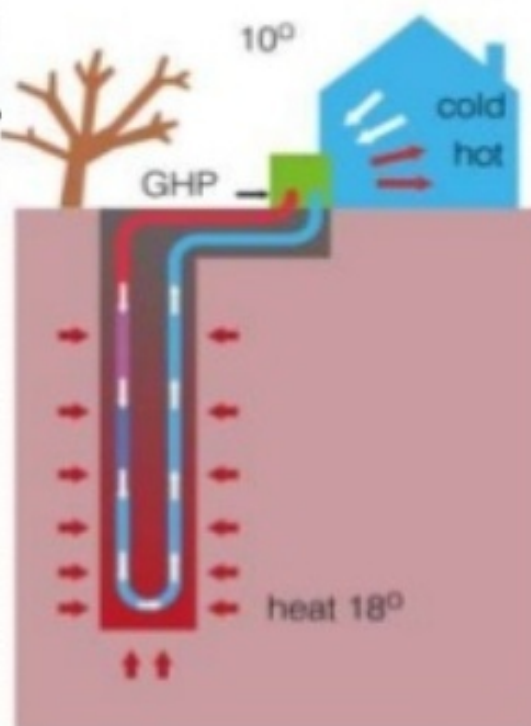
Provides heat to
industrial processes.



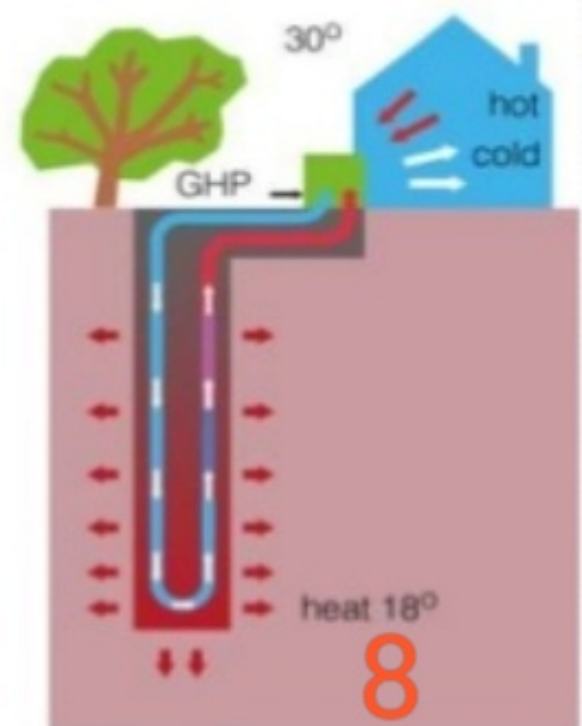
Direct use of Geothermal Energy

- Hot springs, used as spas.
- Heating water at fish farms.
- Provide heat for buildings.
- Raising plants in greenhouses, drying crops.
- Provides heat to industrial processes.

Winter

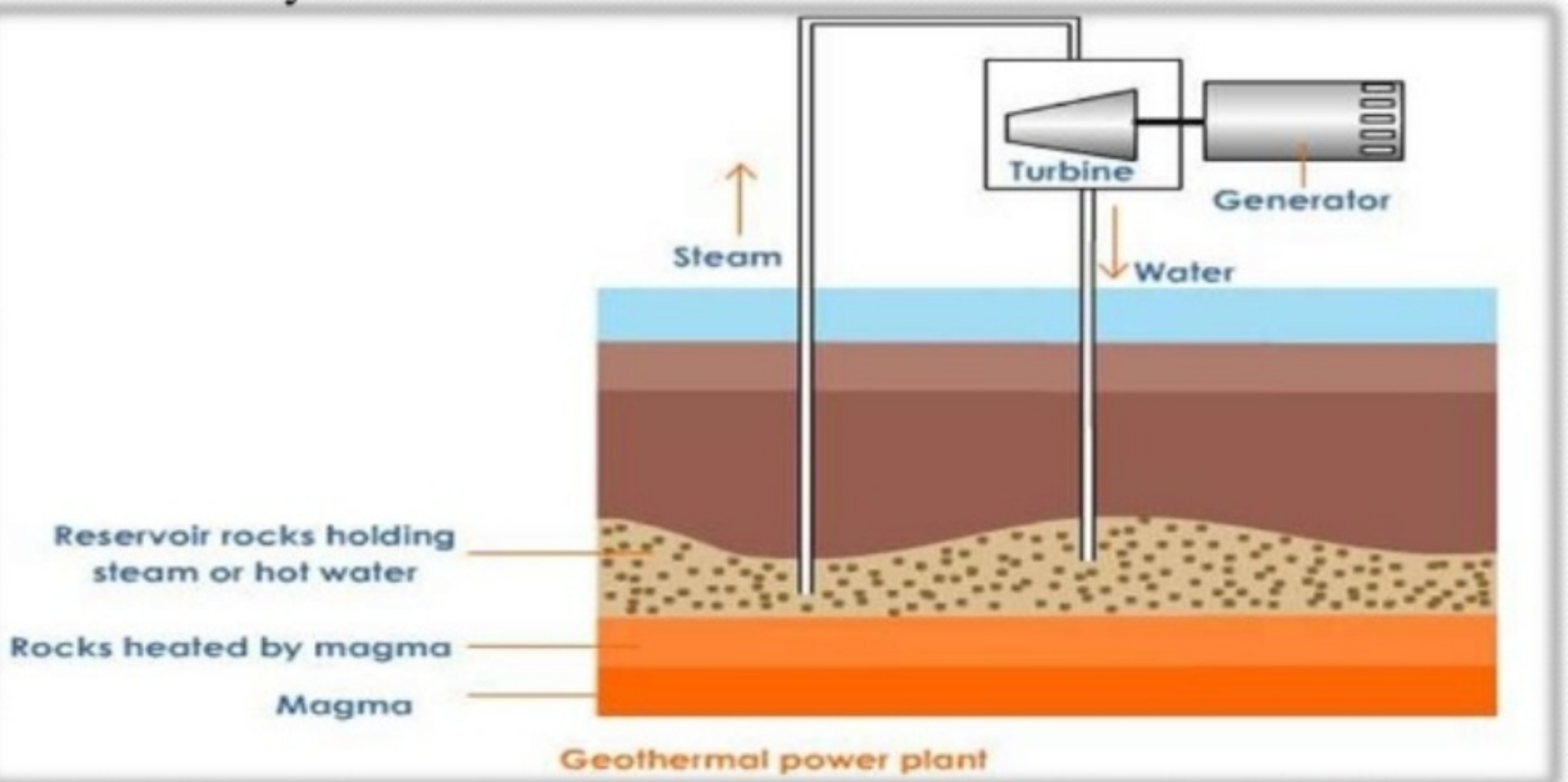


Summer



Indirect use of Geothermal Energy

- Electricity Generation:



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Electricity Generation (cont.)

There are 3 types of power plants:-

- Dry steam power plant
- Flash steam power plant
- Binary cycle power plant

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