

***Alternative sources of***

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***energy***

# *Alternative sources of energy:*

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1. Wind power.
  2. Solar energy.
  3. Geothermal energy.
  4. Water power:
    - hydro-electric power;
    - tidal power;
    - wave power
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# Wind power



# *Wind power*

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The most common way of getting energy from the wind is through setting up “Wind farms”. When they were first introduced they were very expensive, however, over the years, initial costs have fallen, and therefore the cost of getting electricity from the wind has dropped considerably.

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# **Wind power**

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The advantages:

- ☐ wind power enables electricity to be produced in an environmentally friendly way – the turbines do not produce chemical or radioactive emissions. The ground on which the turbines are positioned can still be used for agricultural purposes.

The disadvantages:

- ☐ wind farms can be costly to maintain and electricity produced by this method is more expensive than that produced by other means;
  - ☐ the noise has been criticized by some people who live very close to this;
  - ☐ the turbines can cause some slight electromagnetic interference, which can cause interference with television signals and some communication equipments.
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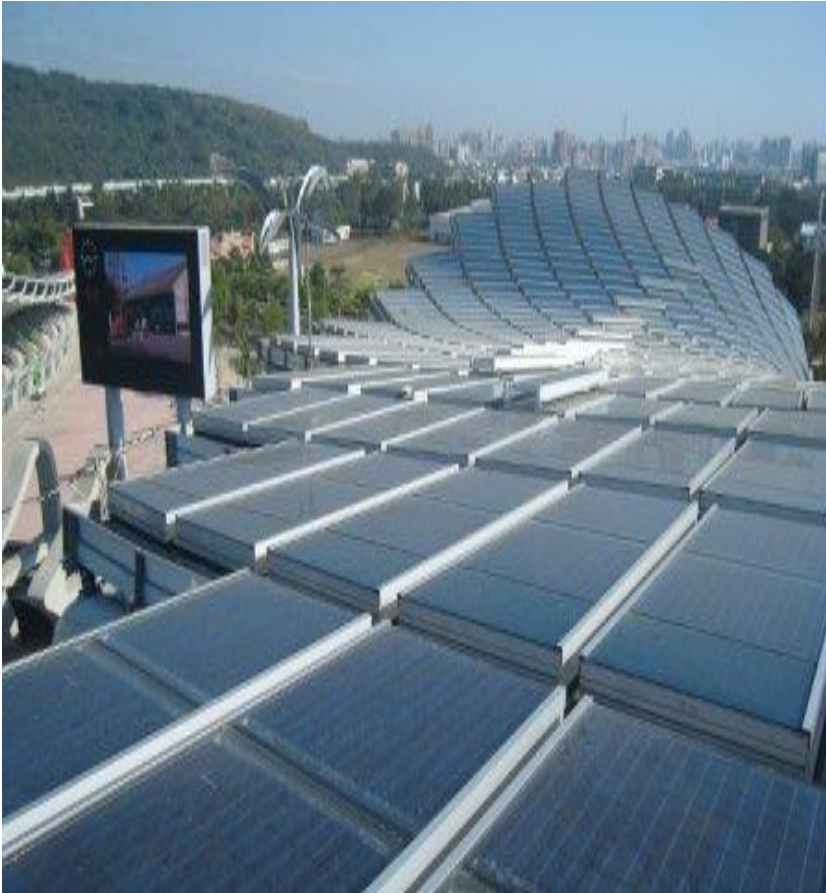
# Solar power





# *Solar power*

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The photovoltaic effect.

Photovoltaic cells (PV's) used as roof tiles.

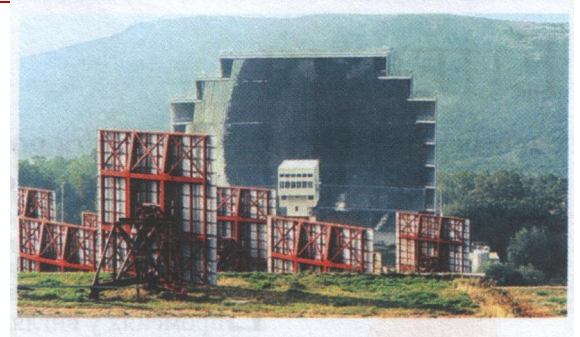
Designing buildings to collect the heat. Large glass windows, heating water pipes

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# *Solar power*

## The advantages:

- ☐ no extra land space is needed;
- ☐ can also be situated in urban areas, where there is plenty of available space;
- ☐ easy to install;
- ☐ replace the need for other materials, such as tiles;
- ☐ generate more electricity than is needed at certain times in the day, so can be sold back to local electricity companies.

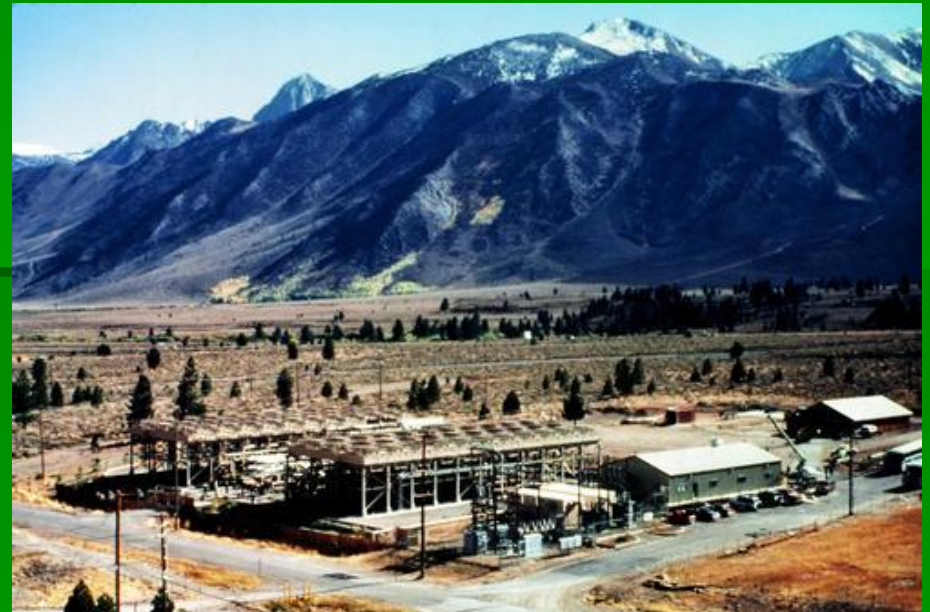


## The disadvantages:

- ☐ depend on changeable weather;
- ☐ costly installation.



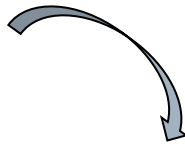
## *Geothermal electric stations*



# ***Geothermal energy***

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*There are hot springs in Iceland,  
which get their warm from  
the Earth*



Geothermal that is “Earth’s heat”. The centre of the earth is hot.

Geothermal heat pumps – using series of pipes to circulate fluid through the warm ground.

Electricity production using a turbine driven by steam, which then drives a generator.

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# **Geothermal energy**

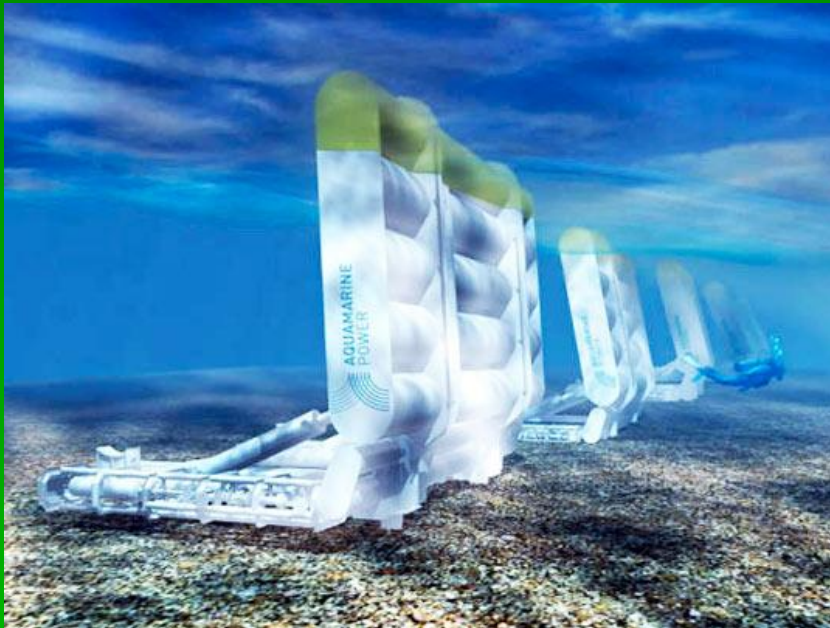
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The advantages:

- ☐ no fossil fuel burning is required;
  - ☐ emit only excess steam and very few trace gases;
  - ☐ take up very little land;
  - ☐ geothermal heat pumps can be used nearly everywhere.
  - ☐ advanced drilling techniques minimize the impact of drilling wells;
  - ☐ electricity produced more “available” as fossil-fuelled power plants produce electricity **65–75%** of the time compared to **90%** from geothermal power plants.
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# Water power



# *Tidal power*



It works by using the gravitational pull of the moon, which creates tidal rises and falls, to produce energy.

# **Tidal power**

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The advantages:

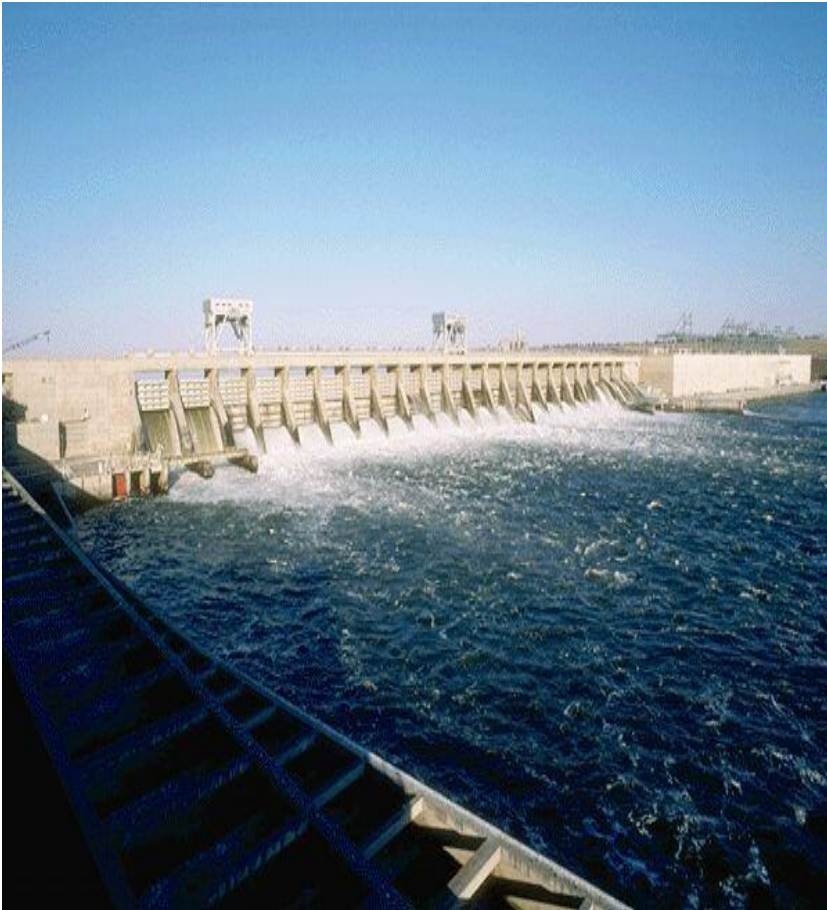
- ☐ using natural forces;
- ☐ in the long-term it could enable cheaper electricity;
- ☐ once up and running, quite safe to the environment.

The disadvantages:

- ☐ tidal power generators can be quite expensive to set-up;
  - ☐ the disruption to the area;
  - ☐ the risk of pollution to the river.
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# **Hydro-electric power**



A reservoir is built with a dam in it.

A mass of water is held back by the dam and then suddenly released all at once, sending the water through a turbine at great force.

# **Hydro-electric power**

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The advantages:

- ☐ pollution free and safe when up and running

The disadvantages:

- ☐ creating it there can be tremendous disruption and upset to the environment, animals and nearby residents;
  - ☐ finding sites large enough for this is quite hard.
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# *Wave power*

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It works by capturing mass of kinetic energy created by waves.

Building dams or pipes for the water to go up.

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# Wave power

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The advantages:

- ☐ with waves which are around **400** m long **700** kilowatts of electricity per metre could be captured;
- ☐ if a suitable site could be found, cheaper and environmentally friendly energy could be created

The disadvantage:

- ☐ disruptive to other industry, such as fishing.
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