

# Energy transfers

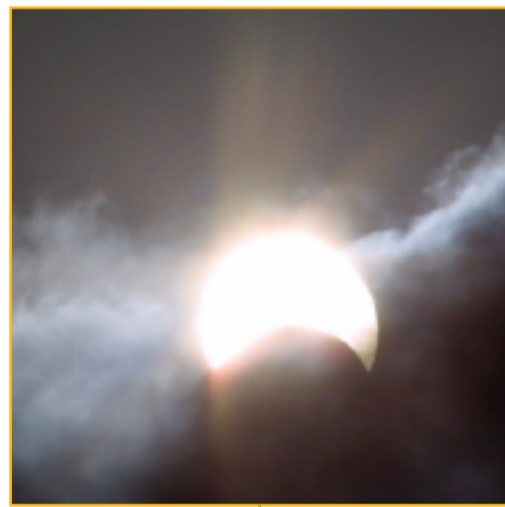
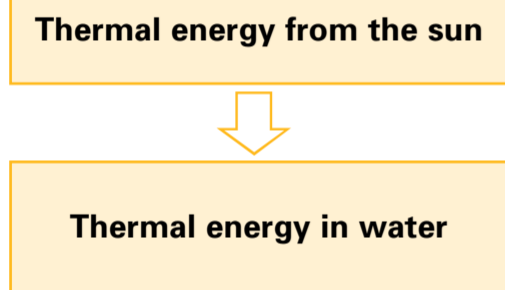
## Solar energy

The sun is the source of most of the energy we use. Every half hour, the sun provides the Earth with the equivalent of a year's worth of electrical energy for the whole world. Renewable energy sources allow us to tap into this vast store of energy, with no danger of it ever being used up.

### Direct solar energy

#### Solar water heating

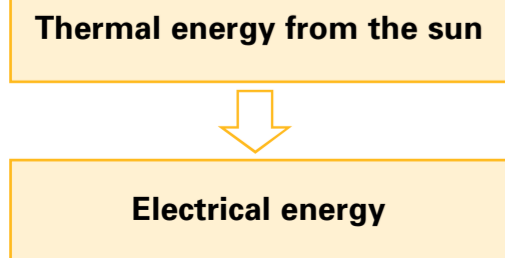
Thermal energy from the sun is transferred to thermal energy in water, which can then be used for heating or washing.



An eclipse of the sun  
Photo courtesy of [www.pdphoto.org](http://www.pdphoto.org)

#### Photovoltaics

Energy from the sun is transferred directly into electrical energy by a photovoltaic cell.



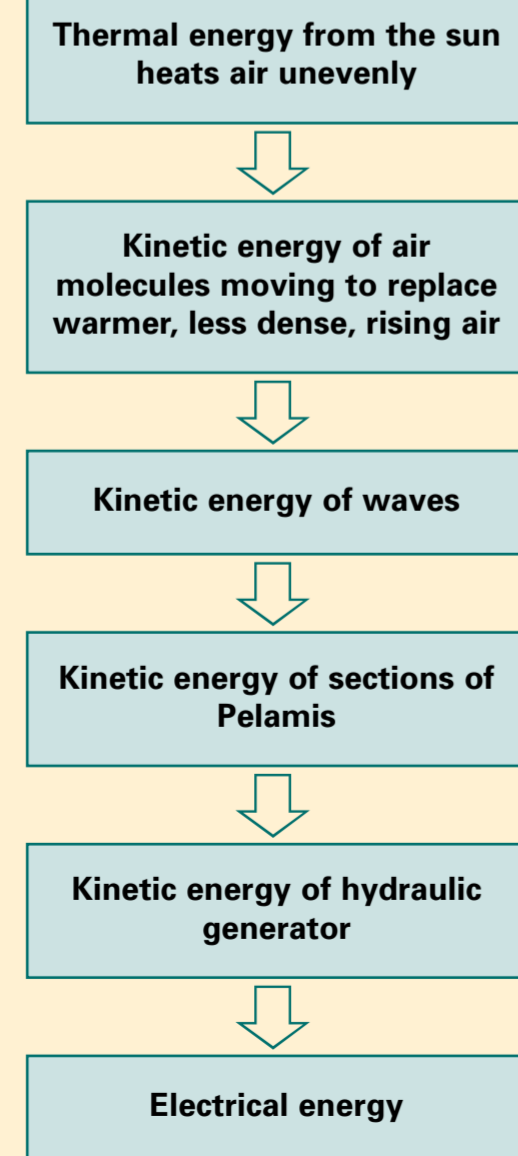
### Indirect solar energy

#### Wave energy

Pelamis is one method for using wave energy currently being developed.

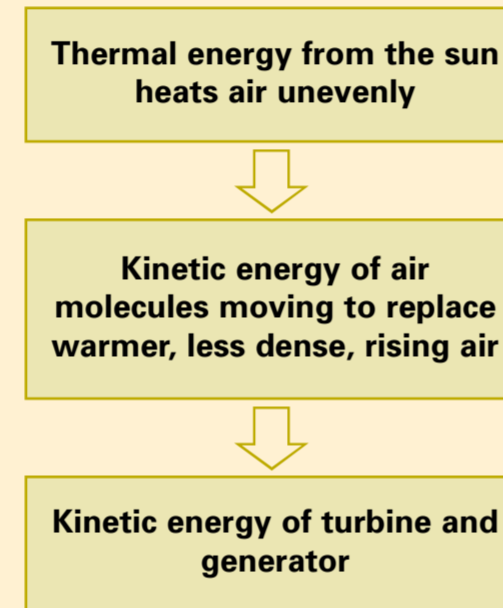


Pelamis near Orkney, Scotland  
Photo courtesy of Ocean Power Delivery



#### Wind energy

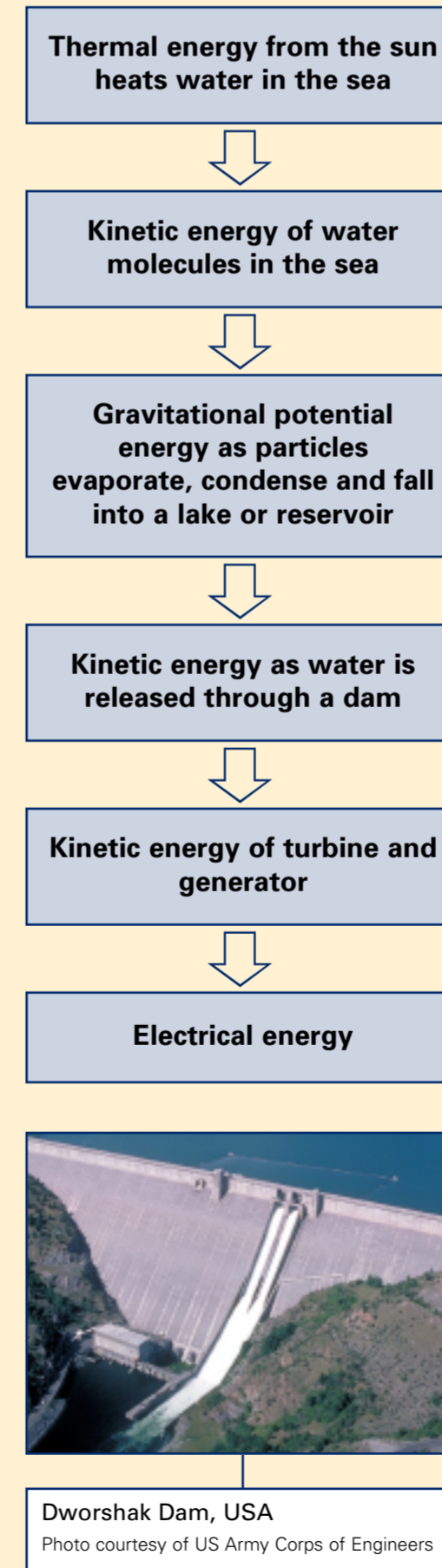
Can be harnessed using wind turbines on land or at sea.



Novar Wind Farm, Ross-shire, Scotland  
Photo © npower renewables 2005

#### Hydroelectric energy

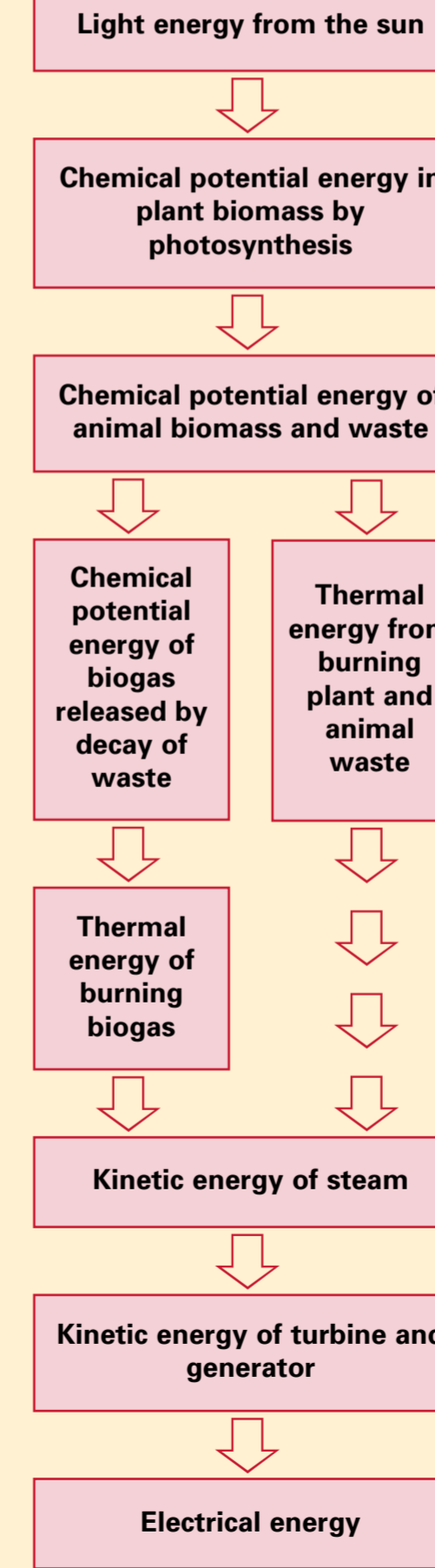
Uses the flow of water through a dam to generate electricity.



Dworshak Dam, USA  
Photo courtesy of US Army Corps of Engineers

#### Bio-energy

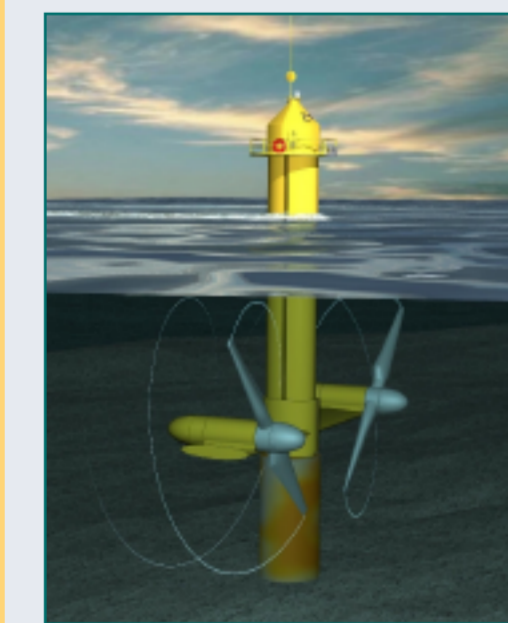
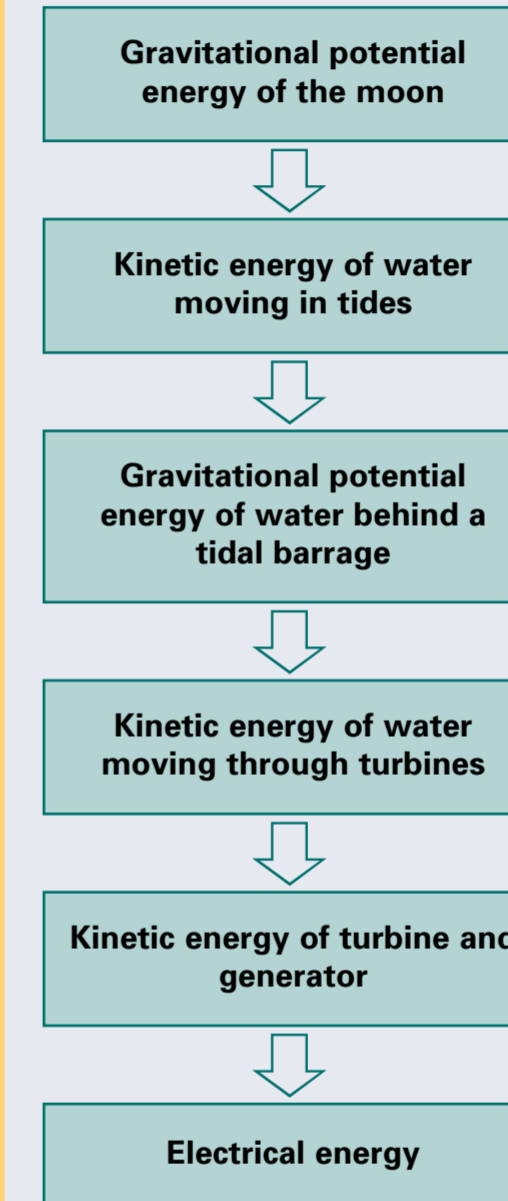
Energy can be harnessed by burning or rotting down plant matter or animal waste.



## Other energy sources

### Tidal energy

Comes from the gravitational potential energy of the moon, which causes tides.



Marine turbine  
Image courtesy of Marine Current Turbines

### Geothermal energy

Uses thermal energy from the hot, semi-molten rocks of the mantle of the Earth.



Old Faithful in Wyoming, USA, which erupts hot steam from far below the Earth's surface every 45 minutes.  
Photo courtesy of [www.pdphoto.org](http://www.pdphoto.org)

