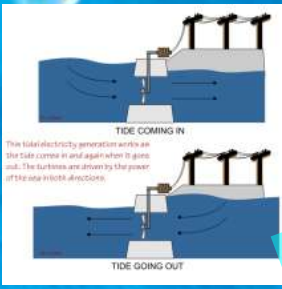
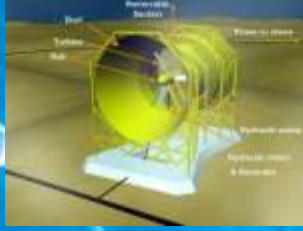
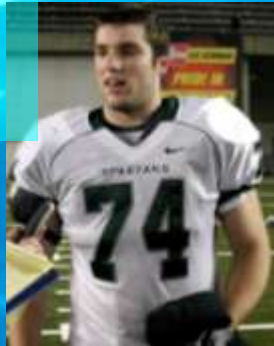


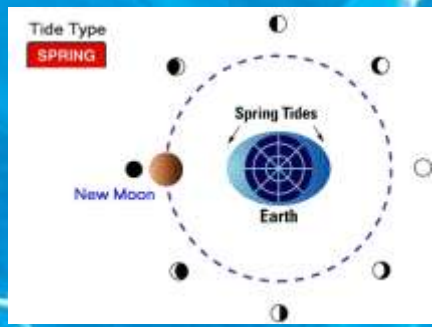
Tidal/wave power



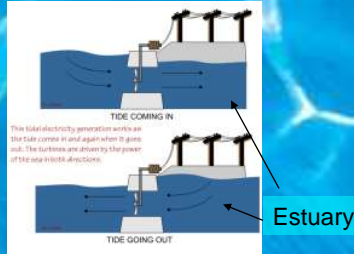
Jeff Walker
Tyler VanGrunsven
Matt Deluca
Scott Shuken

Tides

- Formed by moon
- Gravity
- Spring vs. Neap
 - Sun-Earth-Moon
 - Quarters



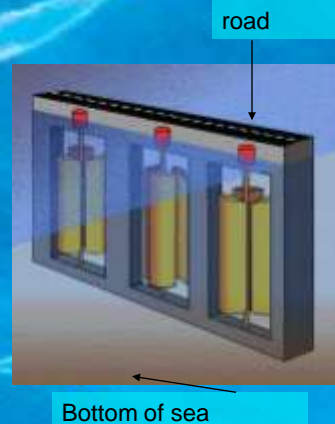
Tidal Power



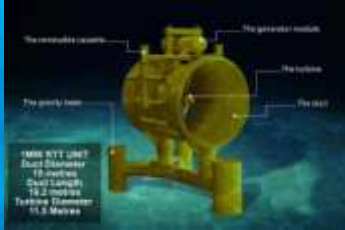
- Tidal Barrages
 - A dam across an inlet of water has gates that control the water input. The incoming high tide goes through the gate and goes into an estuary. Then the outgoing tide goes through turbines to generate electricity.

Tidal Power (cont)

- Tidal Fence
 - Another form of Tidal Barrage
 - Funnels the water through a turbine
 - Has the advantage of using generators and transformers above water

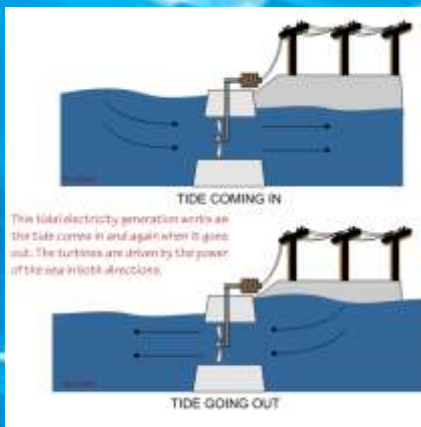


Tidal Power (Cont)



- Tidal Turbine
 - More advantages than other sources of tidal
 - Almost a windmill, flipped upside down and put underwater.
 - As tides move past its propeller, it spins the turbine to generate electricity

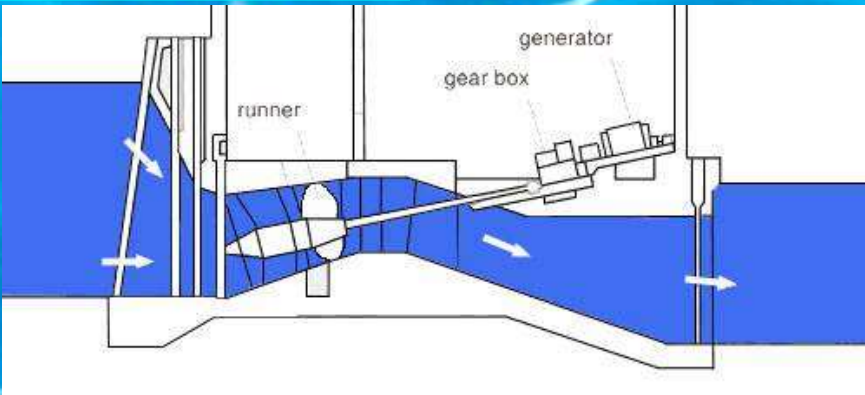
How they work



- As tides come in or out, turbines spin
- Density of water is almost 750x denser than air
 - Small propeller

Tidal Barrage

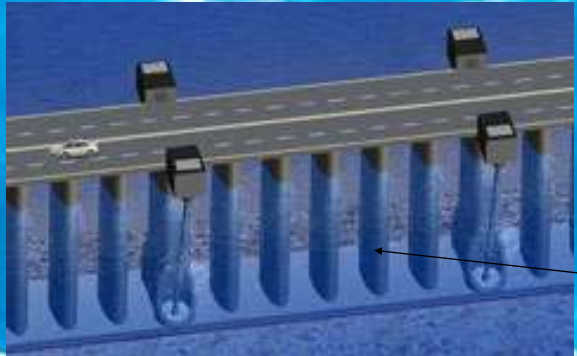
- Generator location
- Maintenance
- Gates



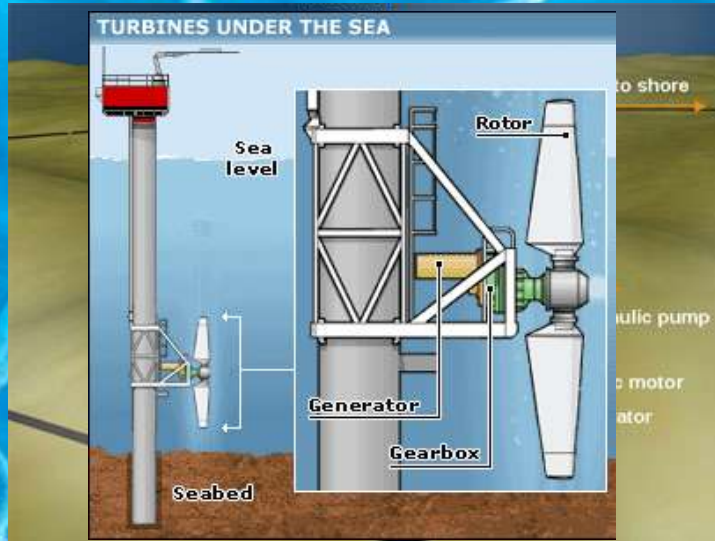
Tubular Turbine

Tidal Fence

- Behavior
- Comparison to barrage
- location



Tidal Turbine



Energy Efficiency

- Tidal energy has an efficiency of 80% in converting the potential energy of the water into electricity, which is efficient compared to other energy resources such as solar power. However, this only works twice a day, as the tides move in and out.



Locations

- Nova Scotia
- Korea
- Annapolis
- Russia (experimental)
- France (largest)

other small ones used
for experimenting



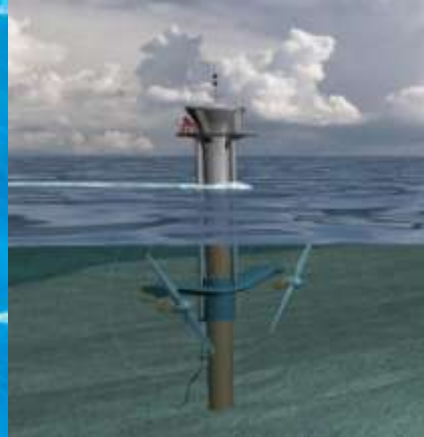
La Rance - Tidal Generator Station

Cost Efficiency

It doesn't cost much to operate tidal power plants, but their construction costs are high and lengthen payback periods. As a result, the cost per kilowatt-hour of tidal power is not competitive with conventional fossil fuel power. However, once built, they have low operation and maintenance costs because the fuel they use - seawater - is free.

Advantages

- 1) The tides can be accurately predicted,
- 2) Increased consistency
- 3) Wave power can produce a lot of energy with a wave
 - 1) Smaller turbine
- 4) It is estimated that 252 billion kilowatt-hours a year is produced off the west coast of America.



Disadvantages

- 1) Expensive to construct
- 2) Power is often generated when there is little demand
- 3) Few areas for building construction
- 4) Negative effects on fish migration
- 5) Can cause flooding



Artwork by Jeff Walker

Interesting facts

- Dated back to 787 A.D.
- 2 types of getting energy from tidal power. Horizontal motion and vertical motion
- Vertical motion follows a sinusoidal graph to turn the generator in a circle
- Profit, effectiveness, all rely on location
- Disrupting balance can change the way turbines work
- Out of all 3 types, the tidal turbine is the best choice for cost, environmental and shipping problems
- Tidal turbines function best when the water velocity is 2-2.5 m*s⁽⁻¹⁾

Video

- <http://videos.howstuffworks.com/planet-green/37369-g-word-tidal-power-video.htm>

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