Hydro Energy

Slide 2: ***Hydro Power***

- Moving water can be extremely powerful.
- The kinetic energy of flowing water can be used to drive all sorts of machinery, including electricity generators.
- Surfers use the kinetic energy of waves to push them to shore.

Slide 3: ***Hydroelectric Power***

- Gravity makes water flow from a high to a low place.
- The moving water contains kinetic energy.
- Hydroelectric power stations are able to change the kinetic energy in moving water to electrical energy.
- In a hydroelectric power station part of a river's flow is sent through pipes.
- The water turns the turbines.
- And the turbines turn the electricity generators.
- The water is returned to the river further downstream.
- In the conventional system, water is stored behind a dam wall.
- The power station is normally situated close to the dam wall.
- The water is released on demand to generate electricity.

Slide 4: ***Hydroelectric Power in SA***

- Eskom operates hydroelectric power stations at both the Gariep Dam and the Vanderkloof Dam.
- In South Africa its most important role is the storage of 'electricity' to meet peak demand fluctuations.
- These hydroelectric plants are also referred to as peaking power stations.
- In mountainous countries, hydroelectricity is an important source of energy.

Slide 5: ***Pumped Storage Plant***

- A Pumped Storage Plant is the only practical way at present of storing "electricity" on a large scale.
- The idea is simply to use surplus electricity – e.g. at night or week-ends during low demand (off-peak periods) – to pump water to a mountain-top reservoir.
- In South Africa we have two such systems in operation: Palmiet (400 MW) and Drakensberg (1 000 MW), whilst Ingula (1 332 MW) is still under construction.

Slide 6: ***Cahora Bassa***

- Cahora Bassa is a hydroelectric power station located in Mozambique that supplies power to South Africa.
- The power line can transmit 1 920 megawatts.

Slide 7: ***Issues Surrounding Large Dams***

Benefits:

- There are potential economic benefits, such as:
  Flood control
  Hydroelectric power.

Concerns:

- The relocation of people who have been or will be displaced by the rising waters.
- Siltation that could limit the dam's useful volume.
- Loss of numerous valuable biospheres, archaeological and cultural sites.
- Loss of habitat.

Slide 8: ***Three Gorges Dam***

- The biggest water storage project in the world is the Three Gorges in China.
- The Three Gorges Dam is a hydroelectric river dam that spans the Yangtze River.
- The total electric generating capacity of the dam will reach 22 500 megawatts, at which point it will be the largest hydroelectric power station in the world.
- The dam is not expected to become fully operational until about 2011.
- As with many dams, there is a debate over costs and benefits.

Slide 9: ***Three Gorges***

- The rising water level on 7 November 2006 can be seen clearly from an aerial photo.
- Compare this to the water level on 17 April 1987.