

Hydroelectricity

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What is Hydroelectricity

- The generation and distribution of electricity derived from the energy of falling water or any other hydraulic source
- In simple terms: Electricity produced by means of water power (Hydropower).

Some Quick History of Hydroelectricity

- 1st Demonstrated in 1878 in Northumberland, England: Powered a single lamp
- Four years later first hydropower plant opened in Wisconsin, USA for private and commercial customers
- Within 10 years hundreds of hydropower plants were in operation

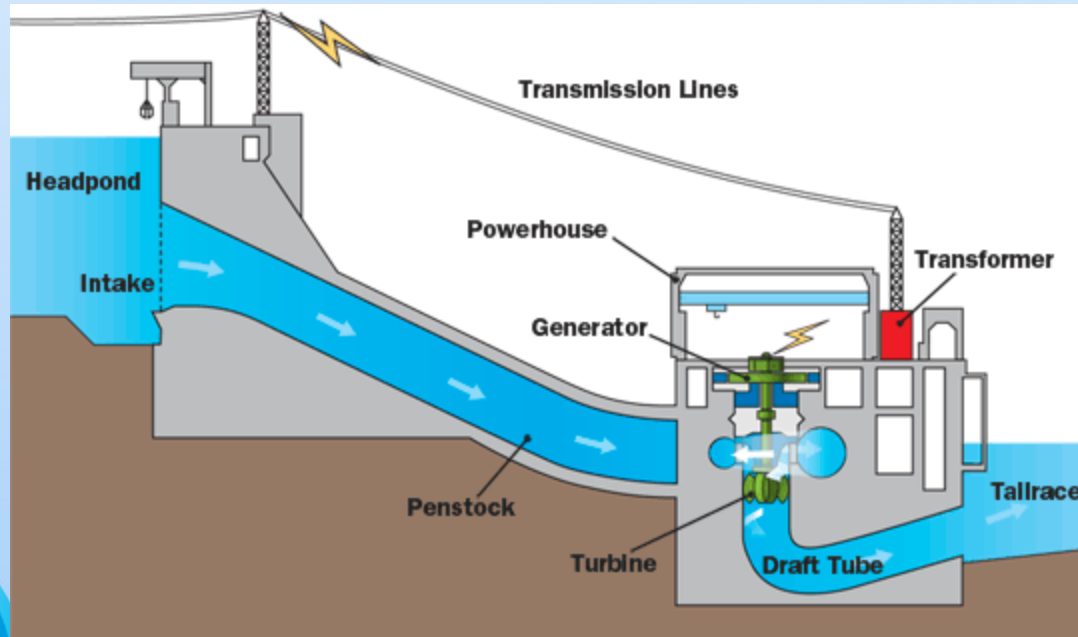
How is Hydroelectricity is produced?

- Force of falling water
- Produced energy is dependent on both amount of water and height from which it falls
- Built up water behind a high damn accumulates potential energy

Production Continued

- Potential energy turned to mechanical energy when water rushes down the sluice and strikes the rotary blades of turbine
- Rotation of turbine spins electromagnetics and this creates current in stationary coils of wire
- Current is put through a transformer where the voltage is increased for long distance transmission over power lines

Visual production of Hydroelectricity



Advantages

- No burned fuel provides minimal pollution
- Water to run power plant is provided by nature
- Reduces greenhouse gas emissions
- Low operations and maintenance costs
- Technology is reliable and proven over time (100+ years)
- Renewable resource: Rainfall renews the water, so the fuel is almost always there

Disadvantages

- High investment costs
- Dependent on rainfall/precipitation for fuel
- Can sometimes cause fish habitat to be changed or lost
- May flood land and wildlife habitat
- Reservoirs may form Methane, cover homes, agricultural lands, etc. which in turn will cause people to relocate

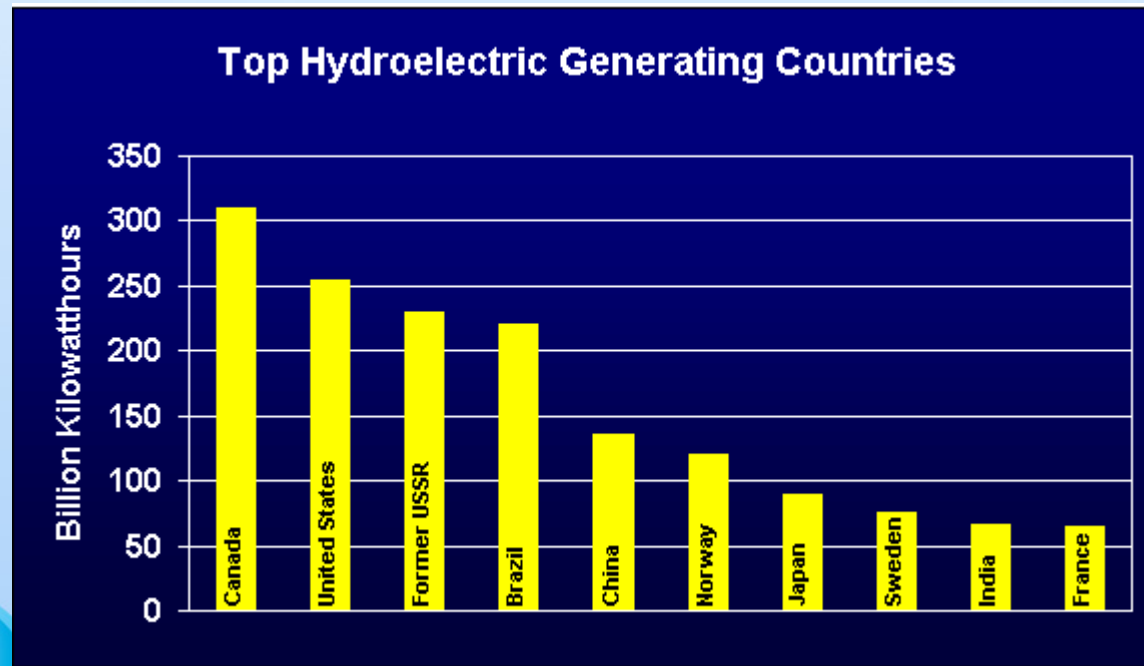
Disadvantages to other power plants that use coal, oil, nuclear, and gas fuels

- Uses valuable and limited natural resources
- Produces a lot of pollution
- Nuclear power plants have waste disposal problems
- Coal, oil, and gas fuels requires companies to penetrate the Earth or drill wells

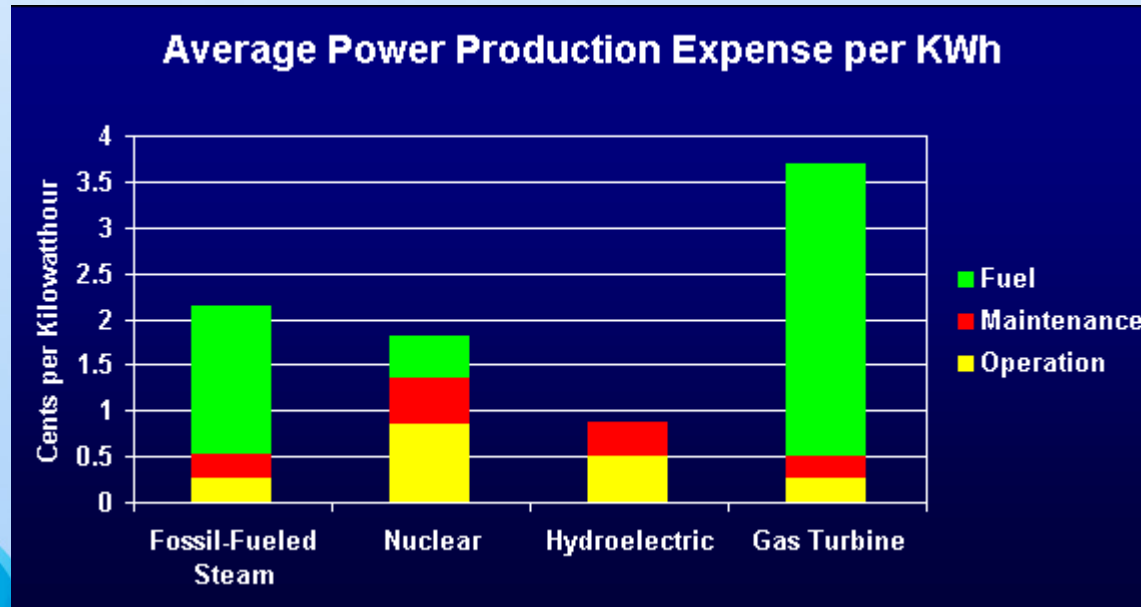
Why can't it produce all power?

- Lots of water and land needed to build a dam and reservoir, which takes a lot of money, construction, and time
- Most good areas to produce hydro plants are already taken
- Number of hydroelectric plants have decreased by 10% since the early part of the century when they supplied nearly half of the United States power

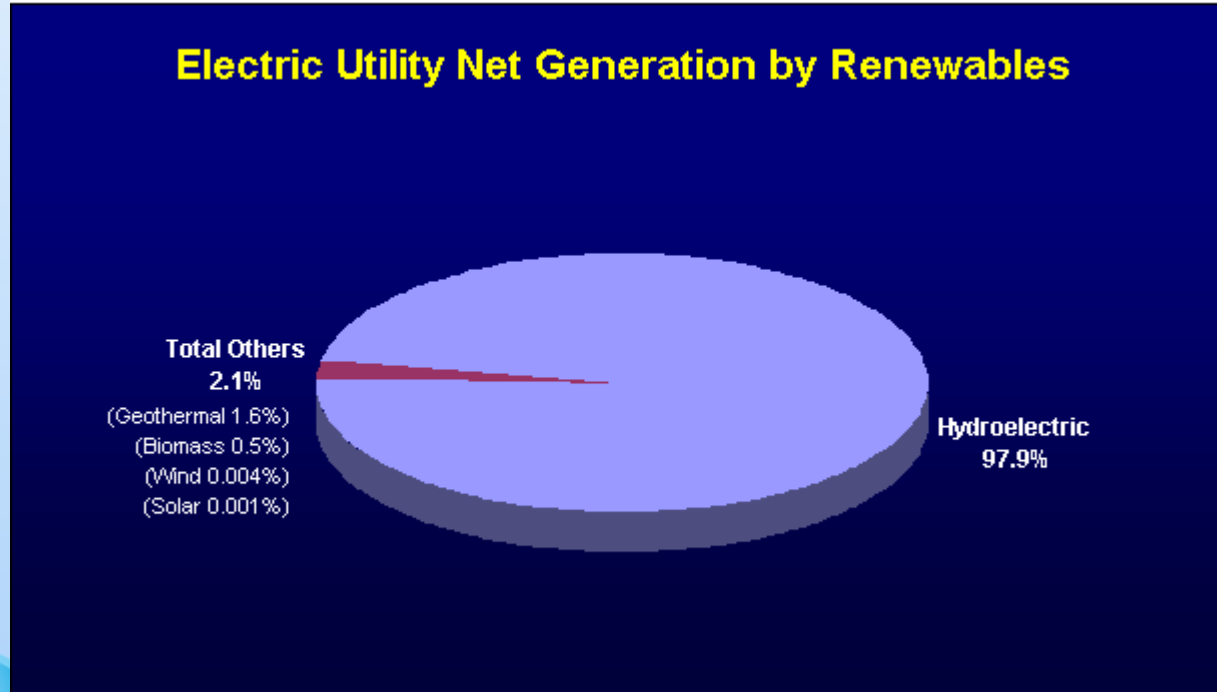
Who uses Hydroelectricity the Most?



Cost in comparison to other ways electricity is produced



Leading Source in Renewable Energy



Final Thoughts on Hydroelectricity

- Hydroelectricity has many advantages over other forms of renewable energy sources. It also has some disadvantages. It is especially valuable since it doesn't leave behind any waste. If possible, I would like to see more ways created to make this the main source of electrical production. This would be a challenge due to the previous setbacks I mentioned from my research. Overall, it is very efficient and reliable if used as an option for producing electricity.

Video Demonstrating the Production of Hydroelectricity

- <https://www.youtube.com/watch?v=-hooifWJ1jY>

References

- [1] <http://www.thefreedictionary.com/hydroelectricity>
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QUESTIONS???

