

POWER GENERATION

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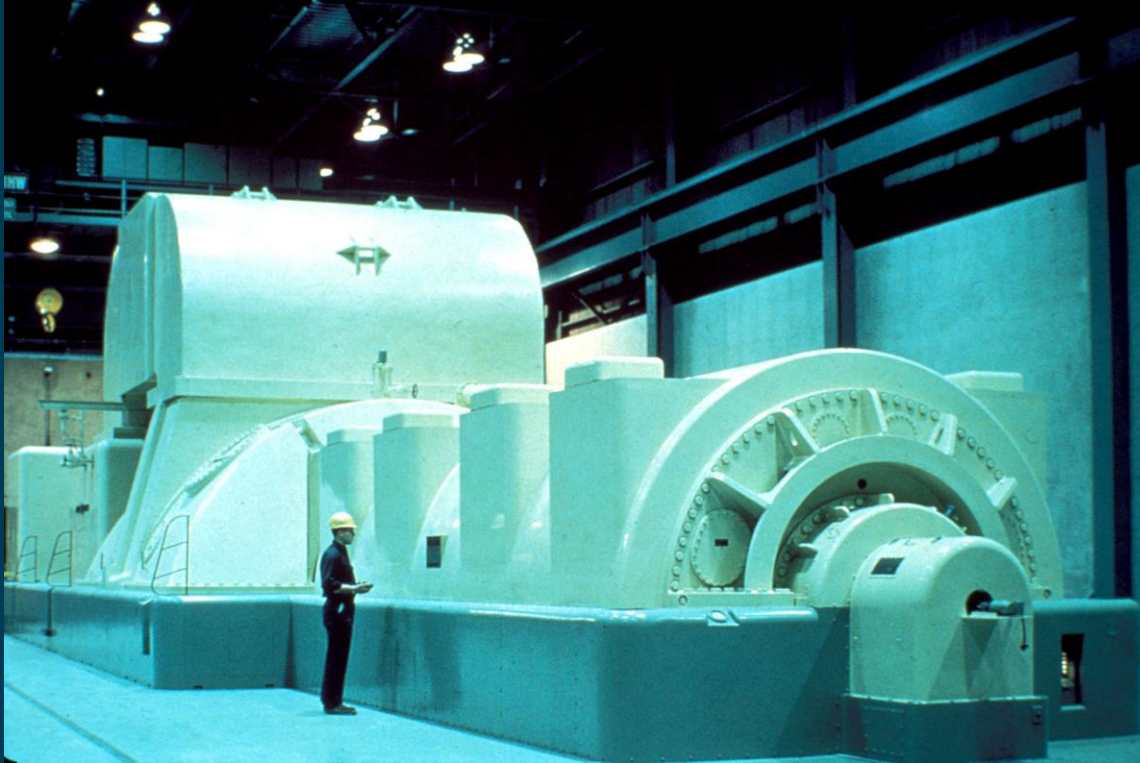
Energy 101

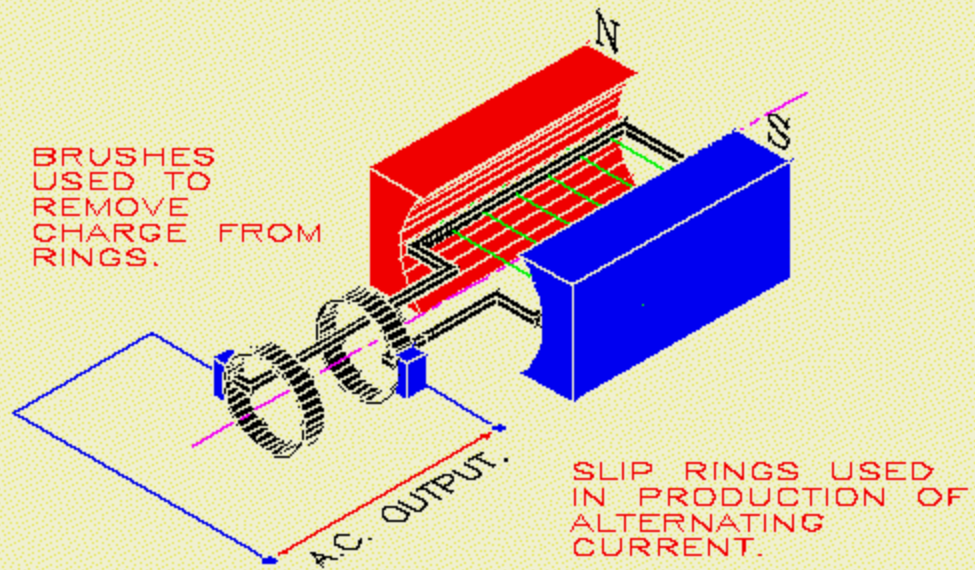
- Introduction
- <https://www.youtube.com/watch?v=20Vb6hLQ5g>

AC GENERATOR

Generator

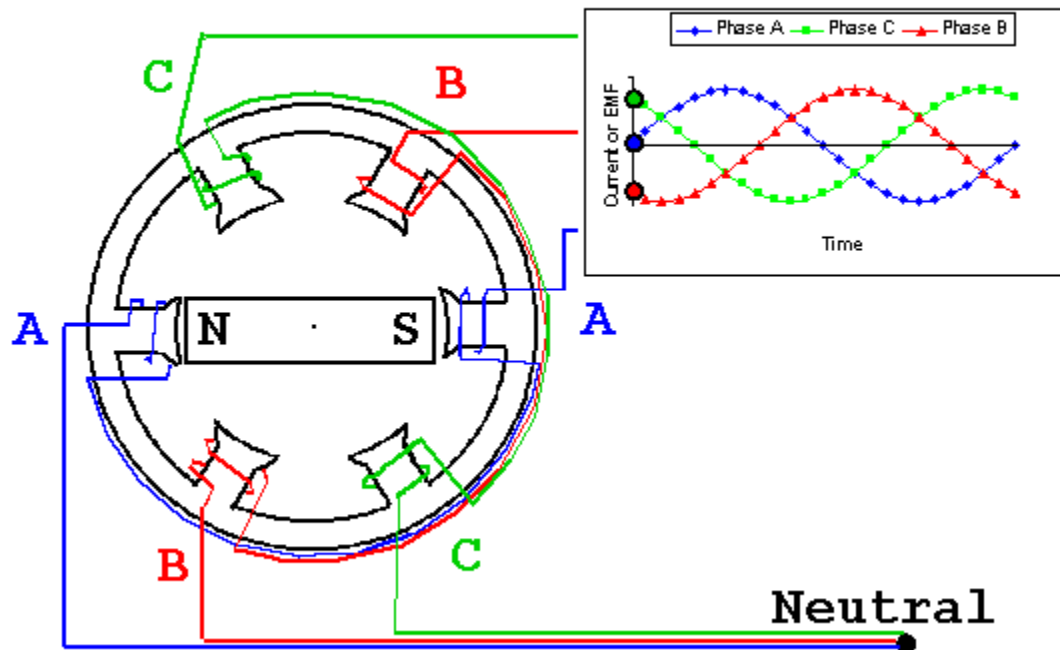
- Converts mechanical energy into electrical energy.





The Generator

3-phase output



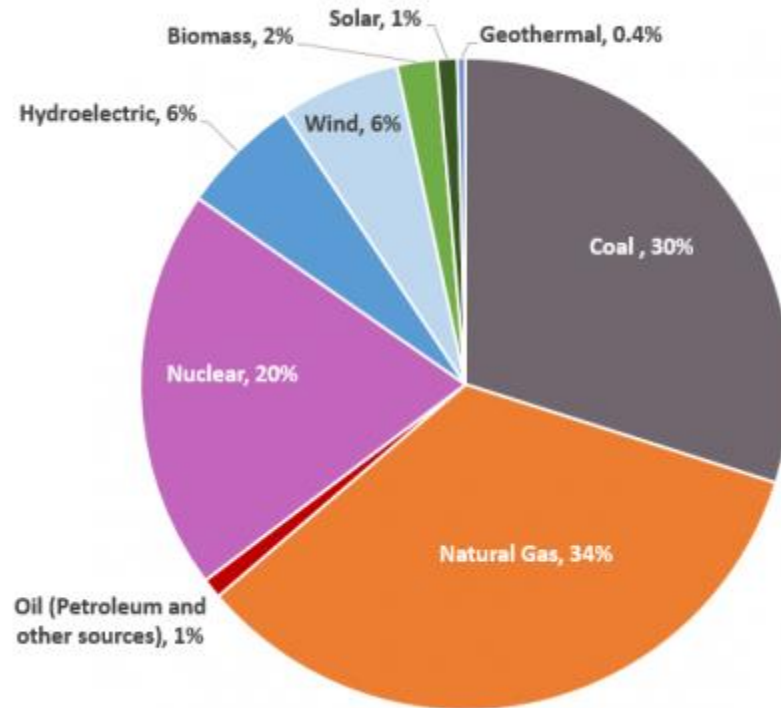
T. Davies 2002

POWER GENERATION

Types of Power Plants

- Thermal Power Plants – 90% of plants
- Renewable Energy Sources
- Storage Power Plants

Net Electricity Generation in the United States By Source (2016)



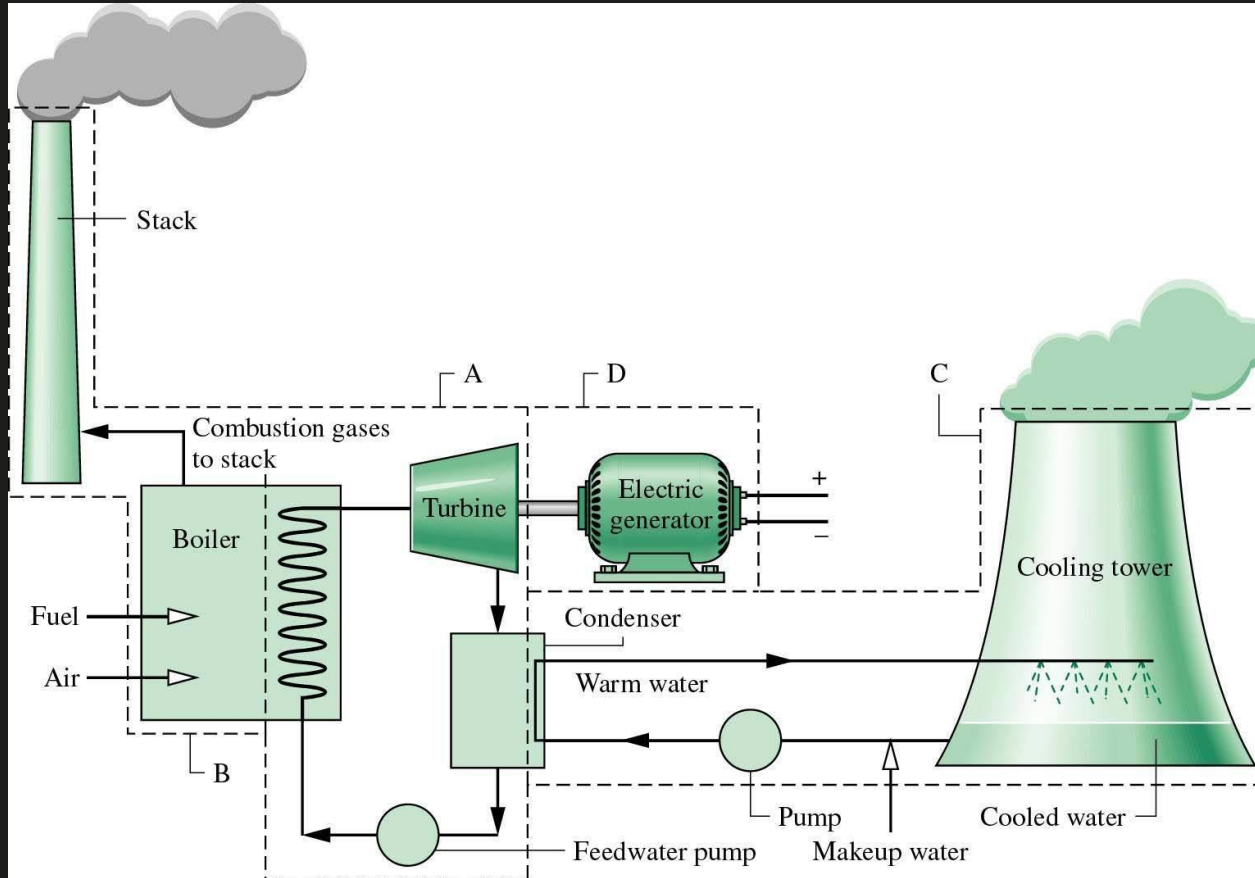
Thermal Power Plants

- Coal
- Natural Gas
- Nuclear

Alabama Power – Plant Simulation

- <https://www.youtube.com/watch?v=0ftl-WM6wms>

Thermal Power Plants



Renewable Energy Sources

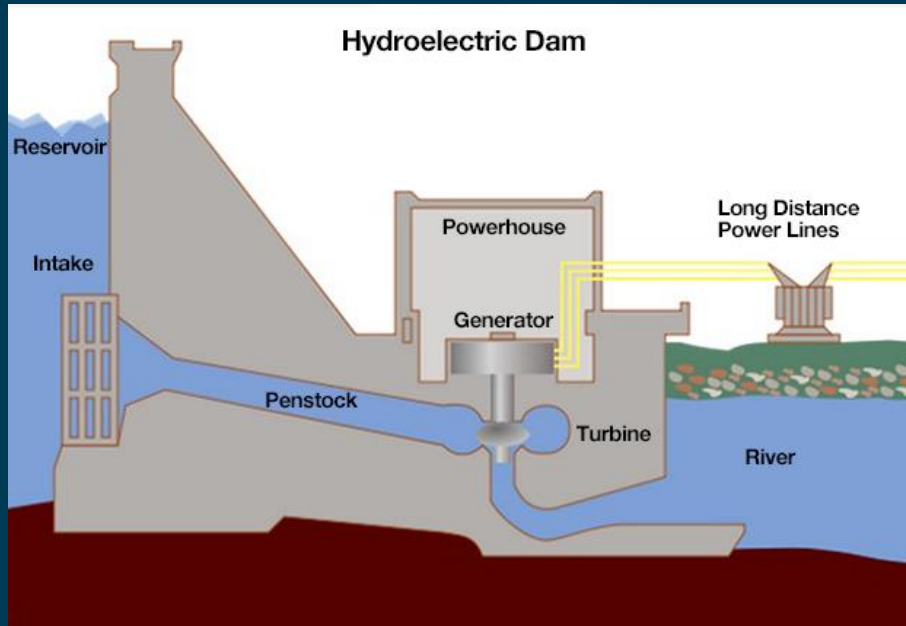
- Hydroelectric
- Solar
- Wind
- Marine
- Osmosis
- Biomass

Storage Power Plants

- How can we use a dam to help store power?

Hydroelectric Dam Stations

- Exactly like the water analogy for electricity!
- One of the primary type of storage power plants.



Power Plants by Load

- Base load power plants run continually.
 - Highly optimized for low fuel cost.
 - Don't start or stop quickly during changes in system load.
- Peaking power plants meet the daily peak load (may only be a couple hours a day).
 - Operating cost is always higher than base load plants.
 - They ensure security of the system during load peaks.
- Load following power plants follow the variations in the daily and weekly load.
 - Lower cost than peaking plants and more flexibility than base load plants.

Daily consumption of electrical power

