

## Material Balance - Example

- A power plant with a heat rate of 10,800 kJ/kWh
- Fuel: Bituminous Coal with 75% Carbon and a heating value (energy released when it is burned) of 27,300 kJ/kg.
- 15% of thermal losses are up the stack, and the remaining 85% are taken away by cooling water
- Q1: Find the efficiency of the plant
- Q2: Find the mass of coal that must be provided per kWh delivered
- Q3: Find the rate of carbon and CO<sub>2</sub> emission from the plant in kg/kWh
- Q4: Find the minimum flow of cooling water per kWh if its temperature is only allowed to increase by 10 C.

