



**Birzeit University – Faculty of Engineering & Technology
Mechanical & Mechatronics Engineering Department
Energy Conversion ENME 531**

Homework #1 (Introduction)

Problem 1 (Problem 1.7 Sorensen).

The installed cost of 300MW steam power plant is \$800/kW. The fixed charges are 18% of the installed cost. The annual plant factor is 0.52. One hundred men are employed in the plant at an average cost of 1800\$/month. Maintenance costs are 450000\$/year. Supplies cost are 140000\$/year. The average coal rate is 0.48 kg/kWh, and the cost of coal is 30\$/ton. Determine the total cost of producing 1kWh of electricity.

Problem 2 (Problem 1.14 A.Culp)

The fuel cost for 800MW power plant is 0.9\$/10⁶ kJ find the total yearly fuel cost for the plant, assuming $\eta_{th} = 0.36$ and load factor = 0.75.

Problem 3

Calculate the fixed charges rate for an energy conversion system which has a life of 30year, assuming $i=10\%$, insurance 2% and no taxes.

Extra credit

- a) Provide data about the annual energy per capita consumption for Palestine including electricity, gasoline, LPG, and Kerosene, and compare to other countries such as Jordan and Israel. Give the source or reference of your data.
- b) For your house (state the location of your home /city) give estimate for:
 - i. Cost of electricity per kWh from you home electricity bill.
 - ii. Annual electricity consumption per capita.