Problem Set #1: PHYS-320   The World: Energy Units & Conversions, Global Energy Use
Due Tuesday, April 7 in class.

Please do your work without a calculator, and estimate your answers best you can. You can check with a calculator. Usually if you are within 20%, that is fine. Please start a list of constants and equations – possibly keep them on a dedicated Excel Spreadsheet. Because you will need to look up values on the web and make some assumptions and estimates, different people will have answers that differ.

Proper canceling of units. We will be learning how to properly cancel units, and work problems out with a pencil to make sure that units work… this is VERY important because the world conspires to make life difficult with units that vary from Watts, to Tons (if ice per day). So, for full credit, please show all units all the way through a problem with proper canceling

1) Your friend leaves a 100 W light bulb on 24/7 because he likes to have the light on.
   a) how much electrical energy does this use in a year? Please put answer in kWh, Joules, and BTU.
   b) How much does this cost in a year?
   c) I convince my friend to just have the light on when he needs it, for 3 hours a day. How much money does this change in lifestyle save him a year?
2) Spend 10 – 15 minutes on the EIA website. Printout or write down your favorite:
   a) graph
   b) statistic
   c) fun fact
3) In the global stocks and flow energy diagram (this is provided for April 2 class on the class website), please estimate how many years our oil will last if we continue using it at the present rate. Assume that we can use every last drop (impossible – most of it is not accessible).
4) Look up the rate of petroleum use and verify that global petroleum use is about 5 TW.
5) Think about an important energy conversion in your life. Describe that transition with a chart that goes from one energy form to the next and extend it in both directions from one of the three primary energy sources we have to a final energy sink.