Name: _____

Class: _____

Due Date: _____

Physics Topic 16 – Specific Energy and Energy Density

Answer the following questions. The solutions to this worksheet can be found on the YouTube channel Go Physics Go.

1. Define *energy density*. Units?

2. Define *specific energy*. Units?

3. The engine of an automobile has a useful power output of 40.0 kW with an efficiency of 55.0%. This engine consumes 1.00×10^{-5} m^3 of petrol every second. Calculate the energy density of the petrol.

4. The energy density of diesel gas is approximately $3.70 \times 10^{10}\ \frac{\text{J}}{\text{m}^3}$. Suppose that diesel gas provides a small city with 25% of useful energy. What is the volume of diesel gas needed to provide this small city with 6.78×10^{12} J of useful energy?

5. On average the output of a power plant in a small city is 500. MW. This power plant uses natural gas to heat up water to rotate its turbines. Natural gas has an energy density of approximately $3.60 \times 10^{7}\ \frac{\text{J}}{\text{m}^3}$ and an efficiency of 30%. Determine the volume of natural gas being burned every second.