

ENRG3310: Introduction to Energy and Sustainability

Prof. Ognjen Š. Miljanić

Midterm III

November 30, 2017

Name: _____

Last

First

Student ID Number: _____

Read directions very carefully. Write your answer legibly in the designated spaces. *Total number of points is 200.*

1. Give examples of government subsidies to alternative energy industries (solar, wind, biofuels, geothermal) in the US and the rest of the world. Provide three examples for the US and three examples for the rest of the world. *30 points*

2. What is the installed solar capacity in Texas? How about California? If Texas and California were independent countries, how would they rank worldwide? *30 points*

3. How much ethanol should you be able to theoretically get from a single corn plant? Show your work and cite your sources. What is the ratio of the masses of obtained ethanol and the corn plant (the entire plant, not just the kernels)? *40 points*

4. Estimate carbon dioxide emissions, in kg, of a suburban home in Houston (located in e.g. Pearland). Assume a four-person, two-car family, and also assume that one of the adults works downtown and other locally. Then, estimate CO₂ emissions if the same family moved to downtown (thus decreasing its commute), lived in a 1600-sqft apartment and both adults worked within 2 miles of their residence.

50 points

5. Is the climate changing in Houston? Plot (a) average June temperatures, (b) average January temperatures, and (c) annual precipitation as a function of time. Remember the difference between climate and weather? You will need to find these statistics for a number of years back: going back to 2010 just won't cut it!

50 points