

Homework Two
Physics & Mathematics of Sustainable Energy
College of the Atlantic
Due Friday, September 22, 2017

Please print out this cover sheet and attach it to your problem solutions. Completed assignments should go in my mailbox or be handed in during class. Please don't hand them to me other times, as I might end up losing them and that would make us both sad.

Your Name: _____

Please list all the students you collaborated with on this assignment:

Did you get help from Anita or Meg?

Did you consult any resources other than our textbook or classnotes? (If yes, please include citations in your solutions.)

Were you able to get enough help so you could complete this assignment to your satisfaction?

Approximately how many hours did you spend on this assignment?

Anything else of note about this assignment? (It was too hard, too easy, lots of fun, too repetitious...)

The work I am turning in for this assignment is an accurate reflection of my own understanding of the material.

Signature: _____ Date: _____

Assignment:

- WeBWorK HomeworkTwo (<https://courses1.webwork.maa.org/webwork2/coa-es10341/>)
- Chapter 11 of SEFaS: 11.3, 11.5, 11.8, 11.9
- **Optional:** Chapter 11, exercises 11.11–11.14. These problems lead you through a derivation of the Betz limit. They involve quite a bit of algebra, and 11.14 uses differential calculus. I would be happy to help explain the the starting point for these calculations; I'm not sure that the explanation I wrote in the book draft is super clear.
- **Optional:** How much land is required to grow the food that you eat? I have no idea what the answer to this is, but I'd be curious to find out. Probably different people have estimated this in different ways, and surely it depends a lot on ones diet. I'd be interested to see what estimates are out there. If you find any (semi)reliable references for this, please let me know.