

**Homework 5****due Tuesday, November 6, 2018**

1. Using the linear programming framework for the modeling of an energy storage device, derive the economic criterion:

$$\frac{\lambda_c}{\lambda_g} \leq \eta_s = \eta_g \eta_c \eta_t^2$$

2. Develop the expression for the expected energy  $\tilde{\mathcal{E}}_j^c$  that can be used for charging an energy storage plant when
  - (i)  $j$  is the first block of a three-state unit
  - (ii)  $j$  is an additional block of a two-state unit whose first block was already loaded
3. **Bonus Question:** This question is aimed as a team assignment and in effect this is a research question and there may be multiple answers.

**Modify** the algorithm for the simulation of a single storage plant to **extend** its capability to allow the simulation of multiple storage plants. You need to **provide** the steps, **justify** the logic proposed and **indicate** that the scheme takes into account all the constraints on each storage unit. In particular, **show** that the scheme reduces to the method given in the notes the case of a single storage unit.