

## ACTIVITY 4: GRID PARITY

**Activity Objective:** Based on the data from activity 1, calculate the LCOE of your PV and CSP system and graph which one PV or CSP has the better chance of reaching grid parity.

**Materials:** Chapter 8, paper, computer, printer. Internet Access, MS EXCEL or other graph software, graph paper

**Definition:** Grid parity is an alternative energy source that can generate power at a LCOE (Levelized Cost of Electricity) that is less than or equal to the price of buying power from the local utility grid. LCOE is generally used when discussing renewable energy sources, like solar and wind power. Grid parity depends upon whether you calculate it from the view of a consumer or power utility. The LCOE of solar photovoltaics (PV) is ruled mostly by the panel costs and PV module costs, which are the main issues when tracking grid parity. Reaching grid parity is the point at which an energy source becomes a competitor for widespread development without government support.

The pricing of electricity from the grid is very complex. Most power sources are generated in industrial scale plants developed by public conglomerates. The utility providing the power and the utility delivering that power to the customers are often separate bodies who enter into an agreement that sets a fixed rate for all of the power delivered. On the other end of the power is an LDC (local distribution company) that charges rates that will cover their power purchases from the variety of producers they use.

The formula for LCOE is listed below:

$$LCOE = \frac{\text{Sum of Costs over Lifetime}}{\text{Sum of Electrical Energy produced over Lifetime}}$$

### REVIEW VIDEOS:

Levelized cost of electricity (LCOE): Solar: LCOE

<https://www.youtube.com/watch?v=T9UH4IGEa6Y>

Grid Parity Rating: <https://www.youtube.com/watch?v=U3I0vLAn-gs>

Grid integration <https://www.youtube.com/watch?v=XtV574KBEbU>

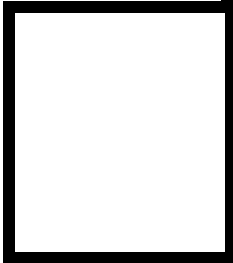
### Procedure:

1. Work as partners or small teams.
2. Research and brainstorm grid parity and the calculations for LCOE.
3. Create a graph showing the LCOE results for both the PV and CSP systems in your model.
4. Develop a Power point presentation on your results.



RUBRIC

<b>4 World-Class Learner</b>	<b>3 Proficient Learner</b>	<b>2 Developing Learner</b>	<b>1 Emergent Learner</b>
Learner at this level has gone beyond mastery of knowledge, skills, & attitudes described in project. World-class learner consistently exhibits high-quality performance.	Learner at this level has had opportunities to apply knowledge, skills, & attitudes of component of project. Proficient learner has mastered essential attributes, thus proving mastery.	Learner at this level has been exposed to & had opportunity to apply knowledge, skills, & attitudes of project. Developing learner may have only a few essential attributes to master before mastery.	Learner at this level may or may not have been exposed to knowledge, skills, & attitudes required by academic standards of the project.



- 1 = Emergent Learner**
- 2 = Developing Learner**
- 3 = Proficient Learner**
- 4 = World-Class Learner**