



# Energy Land

## STEM Sims

### Lesson 2: Creating a Grid

Power companies face a number of challenges in their attempts to provide electrical energy to their customers. Environmental regulations, physical terrain, and people's opinions all impact the decision-making process of power company administrators. Can you determine the best and most cost effective energy resource for supplying a city's electrical demands?

### Doing the Science

1. Start the Energy Land Simulation by clicking on the "Sim" tab.
2. Review the energy sources located at the bottom left-hand corner of the screen.
3. Click on one of the energy resources icons, and then click on one of the white spaces on the map to place the resource power plant at that location. Make sure to note in the Message box the implications of placing that energy resource in that specific location. You can click on another white box to change the location of the energy resource power plant.
4. Once you're happy with the plant's location, record in Table 1 the operating cost of plant, which is displayed in the lower right-hand corner of the screen.
5. Click on the Transmission Line icon. Click on the screen to connect the power plant to the Relay Station, which is the square below the City Grid area. Note and record in Table 1 the new plant operating cost.
6. Repeat steps 3 – 5 with the other energy resources to determine the lowest cost and most environmentally friendly energy resource to operate your power plant.

**Table 1. Energy Resources and Power Plant Operating Costs**

Energy Resource	Plant Only Cost (\$/megawatt×hr)	Plant & Transmission Line Cost (\$/megawatt×hr)
Coal		
Natural Gas		
Nuclear		
Wind		
Offshore Wind		
Solar		
Geothermal		
Biomass		
Hydroelectric		
Tidal		

### Do You Understand?

1. Which power plant type (energy resource) was the overall best? Explain your choice.