



# Survivor Island

## Scenario

Your team of explorers has been dropped on a deserted island, tasked not just with surviving but being comfortable enough to perform scientific experiments for more than a year. Of course, you will need to take advantage of the natural resources to make your settlement last.

## Toolbox

20 guage wire  
Package of aligator clips  
3 or 4 Genecon generators  
Dow rods for pole construction  
Thumbtacks for insulators  
Christmas light for each team member  
3 DC motors  
Wooden foundation blocks for pole construction

## Challenge

Build an electrical grid utilizing generation, transmission, distribution, personal load, and science load. You must power one light bulb per teammember to represent the personal load. You must power three motors to represent the science load. Due to a lack of resources available your personal load and science load must be connected to the same circuit.

## Tips

If you have to add more than one generator to your circuit – always start turning one then add the additional generators one at a time.

Learn about parallel and series – it might make a difference in how well your grid functions!

## Application

Baseload generation – power plants that have a constant fuel supply (e.g. coal, nuclear) that are on all the time (unless in an outage).

Load Following – Because utilities cannot “store” energy, utilities must continuously match the amount of power produced by its generating facilities with the amount of electricity needed by customers. The process of matching this supply to demand is known as load following. To do this, the utility must be able to automatically raise or lower the amount of output from its power generation sources.

Variable Resource – a variable resource is a power plant that has an inconsistent fuel supply (e.g. wind, solar). Since the wind does not blow all the time and the sun does not shine all the time, other baseload resources are needed to match generation to load and sustain the fluctuations in generation output from a variable resource.

Synchronized – Meeting the necessary conditions to operate in exact unison. Generators are considered synchronized if they have identical voltage, frequency, and phase rotation.

