

Heat and Power

When a chemical is formed from its elements it is called a formation reaction. It is logical then that the heat required or given off in this kind of reaction is called the heat of formation. When there is more heat after the reaction, the combining elements have given off energy in the form of heat and the reaction is called exothermic with the sign of the heat of formation being positive. The sign on the heat of formation is negative when there is less heat than before the formation reaction occurred, this reaction is called endothermic because the reaction absorbs heat. In some alternative energy forms the main energy production process is through some action that turns the turbine and consequentially the generator. But other alternative energy forms create heat and do work to eventually create energy.

The first law of thermodynamics is very important to alternative energy forms because it provides a way of measuring the change in energy of an alternative energy process. The first law of thermodynamics states that the change in energy is equal to the sum of all heat in the system plus the amount of work that is done by or on the system. This equation is summarized below:

$$\text{Change in } E = q + w$$

After finding the change in energy for a system the total power of the system can easily be found because of the equation that relates power and energy. It is interesting to note that if the equation for energy and power is resubstituted into the previous equation, a new equation appears:

$$P * t = q + w$$

With this equation, the time required to generate a certain amount of power with certain criterion of an alternative energy system present can be determined. Now you can take a [quiz](#) that tests your understanding of heat and power and a [problem set](#) that gives you some material to work with your calculator.