CLAIMS

1. A power system that generates at least one of electrical energy and thermal energy comprising:

at least one vessel capable of a maintaining a pressure of below, at, or above atmospheric;

reactants comprising:

nascent H_2O;

H_2O;

atomic hydrogen; and

a molten metal;

at least one molten metal injection system comprising a molten metal reservoir and an electromagnetic pump;

at least one additional reactants injection system for supplying the reactants, wherein the additional reactants comprise:

at least one source of catalyst or a catalyst comprising nascent H_2O;

at least one source of H_2O or H_2O, and

at least one source of atomic hydrogen or atomic hydrogen,

at least one reactants ignition system to initiate a reaction from the reactants which forms a plasma, wherein the reactants ignition system comprises a source of electrical power which receives electrical power from a power converter configured to convert at least one of the light and thermal output from the reaction to electrical and/or thermal; and

a system to recover the molten metal.

2. The power system of Claim 1 wherein the molten metal ignition system comprises:

at least one set of electrodes to confine the molten metal; and

a source of electrical power to deliver a short burst of high-current electrical energy sufficient to cause the reactants to react to form plasma.

3. The power system of Claim 2 wherein the electrodes comprise a refractory metal.

4. The power system of Claim 3 wherein the source of electrical power to deliver a short burst of high-current electrical energy sufficient to cause the reactants to react to form plasma comprises at least one supercapacitor.

5. The power system of Claim 1 wherein the molten metal injection system comprises an electromagnetic pump comprising at least one magnet providing a magnetic field and current source to provide a vector-crossed current component.