Summary

In one aspect, there is provided a reducing gas generator, comprising:

a merging chamber configured to receive an oxidant, a recycle gas and a hydrocarbon fuel and discharge a feed stream including the oxidant, the recycle gas and the hydrocarbon fuel;

a first conduit having a first outlet opening to the merging chamber, for conveying the oxidant into the merging chamber;

a second conduit having a second outlet opening to the merging chamber, for conveying the recycle gas into the merging chamber;

a third conduit having a third outlet opening to the merging chamber, for conveying the hydrocarbon fuel into the merging chamber;

a recycle pump in direct fluid communication with the merging chamber and positioned within the second conduit, and the recycle pump being configured to pressurize a flow of the recycle gas through the second conduit, and to discharge the pressurized flow through the second outlet into the merging chamber such that a flow of the oxidant, a flow of the hydrocarbon fuel, and the pressurized flow of the recycle gas are merged therein to form the feed stream;

a catalytic reformer including a catalyst and being in fluid communication with the merging chamber and configured to receive the feed stream and to reform the feed stream to yield a reducing gas; and

a junction operable to receive a portion of the reducing gas and direct a portion of the reducing gas to the recycle pump as the recycle gas.

One embodiment of the present ~~invention~~disclosure is a unique reducing gas generator. Another embodiment is a unique method for generating a reducing gas. Other embodiments include apparatuses, systems, devices, hardware, methods, and combinations for generating reducing gas. Further embodiments, forms, features, aspects, benefits, and advantages of the present application will become apparent from the description and figures provided herewith.