Summary

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

In one aspect, there is provided a method for operating an engine, comprising: providing a combustion chamber of the engine with a fuel; starting the engine using the fuel; starting a reformer, wherein the reformer is configured to reform at least some of the fuel; transitioning from the provision of fuel to the combustion chamber to a provision of reformed fuel; providing only reformed fuel to the combustion chamber; and venting an excess of reformed fuel produced by the reformer, during the transitioning.

In another aspect, there is provided a method for operating an engine, comprising: operating a reformer to reform a fuel; supplying a first portion of the reformed fuel to a combustion chamber of the engine during engine operation; venting a second portion of the reformed fuel at a venting location; wherein the first portion and the second portion are supplied to the respective combustion chamber and the venting location at a first ratio; changing an engine operating condition; and supplying the first portion and the second portion to the respective combustion chamber and venting location at a second ratio in response to the change in the engine operating condition.

In another aspect, there is provided an engine system, comprising: an engine; a reformer configured to receive an oxidant and a fuel and to reform the fuel using the oxidant; a combustion chamber of the engine in fluid communication with the reformer, wherein reformed fuel is received into the combustion chamber; and a valve system configured to transition between 100% unreformed fuel and 0% reformed fuel supplied to the combustion chamber and 0% unreformed fuel and 100% reformed fuel supplied to the combustion chamber, and the valve system including a valve in fluid communication with the reformer and a venting location, and being configured to control a flow of the reformed fuel to the combustion chamber by venting a portion of the reformed fuel at the venting location.

In another aspect, there is provided an engine system, comprising: an engine; a reformer configured to receive an oxidant and a fuel and to reform the fuel using the oxidant; a combustion chamber of the engine in fluid communication with the reformer, wherein reformed fuel is received into the combustion chamber; an engine air intake; and a valve in fluid communication between the reformer and the air intake, wherein the valve is configured to control an amount of flow of the reformed fuel to the combustion chamber by venting a portion of the reformed fuel.