CLAIMS

1. A method for converting CO_2 produced by an internal combustion engine (ICE) on a moving vehicle into hydrocarbon fuel, comprising:

(i) transporting exhaust gas containing CO_2 and produced by said ICE to a heat exchanger to remove excess heat from said gas to form a heat exchanged exhaust gas and moving said heat exchanged exhaust gas to a CO_2 separator to remove CO_2 therefrom, by contacting said heat exchanged exhaust gas with a CO_2 separator which is a membrane permeable to CO_2 and gaseous H_2O but not other gases present in said exhaust gas produced by said ICE; and

(ii) combining said CO_2 with water in an electrochemical reactor to form hydrocarbon fuel.

2. The method of claim 1, further comprising transporting said hydrocarbon fuel to a storage means.

3. The method of claim 1, wherein said heat exchanger is a thermometric cell, a Rankin cycler or a sterling engine.

4. The method of claim 1, further comprising supplying electrical energy from an electrical generator to said electrochemical reactor.

5. The method of claim 1, further comprising supplying heat energy from said heat exchanger to said electrochemical reactor.

6. The method of claim 1, wherein said hydrocarbon fuel is syngas, ethanol, methane, methanol, or dimethylether.

7. The method of claim 1, further comprising producing H_2 at said electrochemical reactor.

8. The method of claim 1, further comprising mixing said hydrocarbon fuel produced at said electrochemical reactor with a primary fuel for said ICE.

9. The method of claim 1, further comprising converting said H_2O and CO_2 to H_2 and CO, and transporting said H_2 and CO to a Fisher Tropsch reactor to produce hydrocarbons.

10. The method of claim 1, further comprising converting said H_2O and CO_2 to H_2 and CO, transporting said H_2 and CO to a water gas shift, and adding H_2O thereto to produce more hydrogen.