CLAIMS

[Claim 1]

A power generation system, comprising:

a pyrolysis device; and

a gas turbine, wherein

the pyrolysis device performs thermal decomposition on a hydrocarbon gas to thermally decompose the hydrocarbon gas into hydrogen and carbon, and

the gas turbine is fueled by a gas mixture of hydrocarbon gas and hydrogen produced by the thermal decomposition performed on the hydrocarbon gas with the pyrolysis device.

[Claim 2]

The power generation system according to claim 1, further comprising a produced gas heat exchanger configured to transfer heat of the gas mixture produced by the pyrolysis device to the hydrocarbon gas supplied to the pyrolysis device.

[Claim 3]

The power generation system according to claim 1 or 2, wherein the pyrolysis device is configured to use heat that burned hydrocarbon gas for the thermal decomposition.

[Claim 4]

The power generation system according to any one of claims 1 to 3, further comprising a compressor configured to compress the gas mixture supplied to the gas turbine.

[Claim 5]

The power generation system according to claim 4, further comprising an upstream-downstream heat exchanger configured to absorb heat from the gas mixture supplied to the compressor so as to decrease a temperature of the gas mixture supplied to the compressor, and configured to transfer the heat, absorbed from the gas mixture supplied to the compressor, to the gas mixture compressed by the compressor so as to increase the temperature of the gas mixture compressed by the compressor.

[Claim 6]

The power generation system according to any one of claims 1 to 5, further comprising a buffer tank configured to hold the gas mixture produced by the pyrolysis device before the gas mixture is supplied to the gas turbine.

[Claim 7]

The power generation system according to any one of claims 1 to 6, further comprising a bypass line configured to supply the hydrocarbon gas to the gas turbine by bypassing the pyrolysis device.

[Claim 8]

The power generation system according to claim 7, wherein the bypass line is configured to be heated by heat of an exhaust of the gas turbine.

[Claim 9]

The power generation system according to any one of claims 1 to 8, wherein the hydrocarbon gas is methane.