Claims

1. A cooling system comprising:

a first heat exchanger for receiving heat from a heat generating system;

a second heat exchanger;

a first closed-loop circuit for conveying heat from the first heat exchanger to the second heat exchanger;

a storage system operable for providing natural gas to the second heat exchanger for receiving heat conveyed by the first closed-loop circuit to the second heat exchanger;

a generator for receiving the natural gas from the second heat exchanger for generating mechanical energy therefrom to thereby reduce temperature of the natural gas, the generator being a turbo expander; ~~and~~

a second closed-loop circuit;

a third heat exchanger for receiving the natural gas from the generator and for heat exchange to receive heat from a third closed-loop circuit to thereby increase the pressure and temperature of the natural gas for provision to a gas engine for generating of energy therefrom, the gas engine being a combined heat and power (CHP) system for generating electricity and heat from the natural gas; and

an adsorption chiller for receiving heat generated by the CHP system for cooling liquid transported along the second closed-loop circuit from the first heat exchanger and returning the cooled liquid to the first heat exchanger;

wherein the third closed-loop circuit is for transporting heat received from the heat generating system ~~and wherein the energy generated by the gas engine being at least one of heat energy and mechanical energy~~.

2. The cooling system as in claim 1, the heat generating system being a computer data center, a server farm, at least one processor, at least one computing unit and a heat-exhaust, the heat generating system being sited on one of a floating platform and a sea-going vessel in open water.

~~3. The cooling system as in claim 2, the heat generating system being sited on one of a floating platform and a sea-going vessel in open water.~~

~~4. The cooling system as in claim 1, the first closed loop circuit has one of water and refrigerant circulating therethrough for conveyance of heat between the first heat exchanger and the second heat exchanger.~~

3~~5~~. The cooling system as in claim 2~~1~~, the natural gas provided by the storage cooling system being liquefied natural gas for provision to the second heat exchanger and the natural gas discharged by the second heat exchanger being vaporized natural gas for provision to the gas engine, the natural gas being methane (CH4) with the gas engine combusting the natural gas to generate the energy and flue gas, carbon dioxide (CO2) is captured from the flue gas by a carbon capture system, the carbon dioxide being further isolated by the carbon capture system for at least one of provided for downstream usage, for storage as one of gaseous carbon dioxide and liquefied carbon dioxide and for conversion into liquid fuel.

~~6. The cooling system as in claim 5, the natural gas being methane (CH4) with the gas engine combusting the natural gas to generate the energy and flue gas, carbon dioxide (CO2) is captured from the flue gas by a carbon capture system, the carbon dioxide being further isolated by the carbon capture system for at least one of provided for downstream usage, for storage as one of gaseous carbon dioxide and liquefied carbon dioxide and for conversion into liquid fuel.~~

~~7. The cooling system as in claim 1, the gas engine being a combined heat and power (CHP) system for generating electricity and heat from the natural gas.~~

~~8. The cooling system as in claim 7, further comprising:~~

~~a second closed-loop circuit; and~~

~~an adsorption chiller for receiving heat generated by the CHP system for cooling liquid transported along the second closed loop circuit from the first heat exchanger and returning the cooled liquid to the first heat exchanger.~~

~~9. The cooling system as in claim 1, the storage cooling system comprising:~~

~~a plurality of insulative vessels for storing the natural gas and inter coupled for selectively providing the natural gas to the second heat exchanger.~~

4~~10~~. The cooling system as in claim 1~~9~~, further comprising at least one of:

a floating platform for supporting the plurality of insulative vessels out on open water; and

a sea-going vessel whereto the plurality of insulative vessels are one of mounted and integrated,

wherein the storage cooling system comprising a plurality of cryogenic dewars for storing the natural gas and inter coupled for selectively providing the natural gas to the second heat exchanger.

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~~11~~5. A cooling method comprising:

receiving heat from a heat generating system by a first heat exchanger;

conveying heat from the first heat exchanger to a second heat exchanger by a first closed-loop circuit;

providing natural gas from a storage system to the second heat exchanger for receiving heat conveyed by the first closed-loop circuit to the second heat exchanger;

providing the natural gas from the second heat exchanger to a generator for generating mechanical energy therefrom to thereby reduce temperature of the natural gas, the generator being a turbo expander; ~~and~~

providing the natural gas from the generator to a third heat exchanger for heat exchange to receive heat from a third closed-loop circuit to thereby increase the pressure and temperature of the natural gas for provision to a gas engine for generating energy therefrom, the gas engine being a combined heat and power (CHP) system for generating electricity and heat from the natural gas; and

receiving heat generated by the CHP system for cooling liquid transported along a second closed-loop circuit from the first heat exchanger and returning the cooled liquid to the first heat exchanger,

wherein the third closed-loop circuit is for transporting heat received from the heat generating system ~~and wherein the energy generated by the gas engine being at least one of heat energy and mechanical energy~~.

~~12~~6. The cooling method as in claim ~~11~~5, the heat generating system being a computer data center, a server farm, at least one processor, at least one computing unit and a heat-exhaust, and the heat generating system being one of mounted on and integrated with one of a floating platform and a sea-going vessel in open water.

~~13. The cooling method as in claim 11, the first closed-loop circuit has one of water and refrigerant circulating therethrough for conveyance of heat between the first heat exchanger and the second heat exchanger.~~

~~14~~7. The cooling method as in claim ~~11~~6, the natural gas provided by the storage system being liquefied natural gas for provision to the second heat exchanger and the natural

gas discharged by the second heat exchanger being vaporized natural gas for provision to the gas engine,

wherein the natural gas being methane (CH4) with the gas engine combusting the natural gas to generate the energy and carbon dioxide (CO2) is captured from the flue gas by a carbon capture system, the carbon dioxide being further isolated by the carbon capture system for at least one of provided for downstream usage, for storage as one of gaseous carbon dioxide and liquefied carbon dioxide and for conversion into liquid fuel.

~~15. The cooling method as in claim 11, the gas engine being a combined heat and power (CHP) system for generating electricity and heat from the natural gas.~~

~~16. The cooling method as in claim 15, further comprising:~~

~~receiving heat generated by the CHP system for cooling liquid transported along a second closed loop circuit from the first heat exchanger and returning the cooled liquid to the first heat exchanger.~~

~~17~~8. The cooling method as in claim ~~11~~5, the storage system comprising:

a plurality of cryogenic dewars ~~insulative vessels~~ for storing the natural gas and inter coupled for selectively providing the natural gas to the second heat exchanger,

wherein the plurality of cryogenic dewars ~~insulative vessels~~ being one of supported on a floating platform and one of mounted on and integrated with a sea-going vessel.