Claims

1. An energy supply system comprising:

a first energy supply network in the form of a power network for transporting electrical energy;

a second energy supply network with a transport system for fluid operating materials;

a transport system for returning carbon dioxide-containing residual gases that occur during energetic utilization of the fluid operating materials at one or more energy consumers; and

at least one energy-generating unit with which the fluid operating materials can be produced from carbon-containing material and fed into the second energy supply network;

wherein at least one local energy management unit for supplying a local energy supply network with which the fluid operating materials taken from the second energy supply network can be converted into electrical energy and fed into a local power network,

wherein the at least one energy management unit comprises devices for extracting electric current from the power network of the first energy supply network of the energy supply system, converting it into lower-voltage electric current, and feeding this lower-voltage electric current into a power network of the local energy supply network; as well as devices for extracting the fluid operating materials from the transport system for fluid operating materials of the energy supply system, for generating electric current from said fluid operating materials, and for feeding the electric current into said power network of the local energy supply network; and devices for collecting residual gases occurring during the energetic utilization of the fluid operating materials in the energy management unit, and for returning these residual gases to the residual gas transport system of the energy supply system;

by a control unit of the energy supply system that can communicate via a communication network with the at least one energy-generating unit and the at least one energy management unit or with another energy consumer of the energy supply system and is set up for the purpose of controlling the operation of the various units; and

by a control system of the at least one energy management unit that is set up for the purpose of communicating via the communication network with the control unit of the energy supply system;

wherein the control unit of the energy supply system controls the delivery rates of electric current from the power network of the first energy supply network and of fluid operating materials from the second energy supply network such that a maximally small dimensioning of the second energy supply network is achieved in relation to the line cross section and/or the operating pressure.

2. The energy supply system as set forth in claim 1, wherein the control unit of the energy supply system controls the delivery rates of electric current from the higher-level power network and of fluid operating materials from the operating material transport system such that a maximally uniform loading of the corresponding supply networks over time is achieved.

3. The energy supply system as set forth in claim 1, wherein the at least one energy-generating unit extracts residual gas from the residual gas transport system and uses its carbon-containing fractions to produce the fluid operating materials.

4. The energy supply system as set forth in claim 1, further comprising a system for the electrolytic production of hydrogen gas for use in the manufacture of the fluid operating materials.

5. The energy supply system as set forth in claim 1, wherein the at least one energy-generating unit includes a utilization system, with a first subunit for performing pyrolysis of carbon-containing material into pyrolysis coke and pyrolysis gas; a second subunit for performing a gasification of the pyrolysis coke into synthesis gas and residues; and a third subunit for performing a conversion of the synthesis gas into fluid operating materials, return gas being left over; and wherein all three subunits are closed in a pressure-tight manner and form a closed circuit; a transport line for the pyrolysis gas connects the first subunit to the second subunit and/or with to the third subunit; a transport line for the synthesis gas that connects the second subunit in a pressure-tight manner to the third subunit and/or to the first subunit; and a transport line for the return gas that connects the third subunit in a pressure-tight manner to the first subunit and/or to the second subunit; and wherein the hydrogen gas is fed into at least one of the three subunits.

6. The energy supply system as set forth in claim 5, wherein the third subunit comprises a Fischer-Tropsch synthesis step and/or a liquid-phase methanol synthesis step.

7. The energy supply system as set forth in claim 5, wherein the utilization system feeds residual gas from the second energy supply network into at least one of the three subunits.

8. The energy supply system as set forth in claim 1, wherein the at least one energy-

generating unit comprises a system for producing electric current.

9. The energy supply system as set forth in claim 8, wherein the system for producing electric current includes a steam turbine operated by process steam.

10. The energy supply system as set forth in claim 8, wherein the system for producing electric current includes a gas turbine operated with fluid operating materials or a combined gas/steam turbine.

11. The energy supply system as set forth in claim 8, wherein at least one energy-generating unit is provided for feeding the electric current produced into the first energy supply network.

12. The energy supply system as set forth in claim 11, wherein the control unit communicates via a communication network with control units of other energy supply systems and/or with external power stations and/or with control systems of power networks of higher hierarchy levels.

13. The energy supply system as set forth in claim 12, wherein the control system of the at least one energy management unit communicates via a communication network with local energy consumers and local energy producers of the local energy supply network.

14. The energy supply system as set forth in claim 11, wherein the at least one energy management unit includes devices for heating heat media and/or chilling cold media, the energy required for the heating and/or chilling drawn from the power network of the energy supply system and/or obtained through the energetic utilization of the fluid operating materials obtained from the operating material transport system of the energy supply system, and devices for feeding the heated heat media and/or chilled cold media into corresponding heat transport systems or cold transport systems of the local energy supply network.

15. The energy supply system as set forth in claim 11, wherein control unit of an energy supply system controls and coordinates the at least one energy-generating unit and the at least one energy management unit so that the maximum transport rates into the two energy supply

networks are lower than without control.

16. An energy management unit for supplying a local energy supply network, comprising: devices for extracting electric current from a higher-level power network of an energy supply system, converting it into lower-voltage electric current, and feeding this lower-voltage electric current into a power network of the local energy supply network; and devices for extracting the fluid operating materials from a transport system for fluid operating materials of the energy supply system, for generating electric current from said fluid operating materials, and for feeding the electric current into said power network of the local energy supply network; characterized by a control system that is set up for the purpose of communicating via a communication network with a control unit of the energy supply system, and controlling the delivery rates of electric current from the higher-level power network and of fluid operating materials from the operating material transport system such that a maximally uniform loading of the corresponding supply networks over time is achieved, and/or a minimally small dimensioning of the second energy supply network is achieved in relation to the conductor cross section and/or the operating pressure.

17. The energy management unit as set forth in claim 16, wherein the control system communicates via a communication network with local energy consumers and local energy producers of the local energy supply network.

18. The energy management unit as set forth in claim 16, wherein the control system controls the energy management unit to draw substantially only the base load of the power requirement of the local energy supply network from the higher-level power network, whereas the peak load of the power requirement of the local energy supply network is covered by the energetic utilization of fluid operating materials.

19. The energy management unit as set forth in claim 16, wherein the control system controls the energy management unit so that the delivery rate of fluid operating materials from the operating material transport system is substantially constant over time.

20. The energy management unit as set forth in claim 16, further comprising devices for collecting residual gases occurring in the energy management unit during the energetic utilization of the fluid operating materials and for returning these residual gases to a residual

gas transport system of the energy supply system.

21. The energy management unit as set forth in claim 16, further comprising devices for heating heat media and/or chilling cold media, the energy required for the heating and/or chilling drawn from the power network of the energy supply system and/or obtained through the energetic utilization of the fluid operating materials obtained from the operating material transport system of the energy supply system, and a device for feeding the heated heat media and/or chilled cold media into corresponding heat transport systems or cold transport systems of the local energy supply network.

22. An energy management unit for supplying a local energy supply network, comprising: devices for extracting electric current from a higher-level power network of an energy supply system, converting it into lower-voltage electric current, and feeding this lower-voltage electric current into a power network of the local energy supply network; and devices for extracting the fluid operating materials from the transport system for fluid operating materials of the energy supply system, for generating electric current from said fluid operating materials, and for feeding the electric current into said power network of the local energy supply network; characterized by a control system that is set up for the purpose of communicating via a communication network with a control unit of the energy supply system, and by devices for collecting residual gases occurring during the energetic utilization of the fluid operating materials in the energy management unit, and for returning these residual gases to a residual gas transport system of the energy supply system.

23. The energy management unit as set forth in claim 22, wherein the control system alternately extracts fluid operating materials from a transport system for fluid operating materials and residual gases of the energy supply system designed as a common line system, and feeds residual gases into this common line system.

24. A method for supplying one or more local energy supply systems with electrical energy), comprising:

drawing electrical energy from a higher-level power network and feeding into a first energy supply network;

producing fluid operating materials using at least one energy-generating unit, optionally temporarily storing the fluid operating materials, and feeding the fluid operating materials into a

second energy supply network, the energy required for the production of the fluid operating materials being drawn from the higher-level power network and, optionally, additionally obtained from energy-containing, carbon-containing source materials;

drawing electrical energy from the first energy supply network using at least one energy management unit and feeding into the local power network;

obtaining energy in the form of fluid operating materials from the second energy supply network using the at least one energy management unit , optionally temporarily storing the fluid operating materials, and producing electrical energy for the local energy supply system through the energetic utilization of the fluid operating materials and feeding the electrical energy into the local power network; and

producing fluid operating materials by means of the at least one energy-generating unit as well as obtaining of the two different forms of energy in the form of electrical energy and fluid operating materials from the first energy supply network and from the second energy supply network is controlled and coordinated by the at least one energy management unit such that the maximum transport rates into the two energy supply networks are lesser than without control.