CLAIMS

1. A method for regulating a thermal output capacity of a well system, the well system including a working fluid capable of thermal charging from a geologic formation, and having an inlet well and an outlet well and disposed within the geologic formation, comprising:

modulating circulation of said working fluid within said well system to oscillate thermal output from thermally charged working fluid about a characteristic predetermined potential thermal output capacity of said geologic formation, where an averaged oscillated thermal output equals or is less than said characteristic predetermined potential thermal output capacity of said geologic formation and where said characteristic predetermined potential thermal output capacity is determined based on a baseload thermal output of said working fluid flowing at a constant flow rate.

2. The method as set forth in claim 1, wherein said thermal output is inconstant.

3. The method as set forth in claim 1, wherein said thermal output is cycled between a charging operation where said working fluid is thermally charged through conductive heat transfer from said geologic formation and a discharging operation where thermal energy is removed for processing.

4. The method as set forth in claim 3, wherein the processing comprises conversion to at least one of electrical energy, heat energy and combinations thereof.

5. The method as set forth in claim 3, wherein the modulating includes at least one of variation in flow rate of said working fluid, residency time in said system, oscillation duration, thermal charging duration, thermal discharging and combinations thereof.

6. The method as set forth in claim 1, further including a step of generating on demand energy to an end user through interaction between said working fluid and a power generation device.

7. The method as set forth in claim 1, wherein said thermally charged working fluid is circulated above said characteristic predetermined potential thermal output capacity in a discharging cycle to produce on demand power.

8. The method as set forth in claim 1, wherein said geologic formation is selected from a group comprising: a geothermal formation, a low permeability formation, a sedimentary formation, a volcanic formation, a high temperature formation, a variable permeability formation and combinations thereof.

9. The method as set forth in claim 1, wherein cracks, fissures, voids, and/or fractures of said geologic formation are small enough to not allow fluid communication between to spaced-apart inlet and outlet wells.

10. The method as set forth in claim 1, wherein cracks, fissures, voids and or fractures are induced in said geologic formation.

11. The method as set forth in claim 10, further including a step of sealing said cracks, fissures, voids and or fractures is coincident with drilling said inlet and outlet wells.

12. The method as set forth in claim 10, further including a step of sealing said cracks, fissures, voids and or fractures occurring subsequent to drilling said wells.

13. The method as set forth in claim 1, wherein said working fluid includes at least one of a drag reducing additive, a surfactant, a polymeric compound, a suspension, a biological additive, a stabilizing agent, anti-scaling agents, anti-corrosion agents, friction reducers, anti-freezing chemicals, biocides, hydrocarbons, alcohols, refrigerants, phase change materials, organic fluids and combinations thereof.

14. The method as set forth in claim 5, wherein an interaction between said charged working fluid and a power generator includes minimizing said residency time by increasing the flow rate of said charged working fluid.

15. The method as set forth in claim 1, further including a step of storing thermal energy from said charged working fluid in said geologic formation.

16. The method as set forth in claim 1, further including a step of supplementing said working fluid with energy charged working fluid from adjacent wells in said geologic formation.

17. The method as set forth in claim 16, wherein supplementing includes rerouting working fluid from adjacent wells to a well and a power generation device under user demand.

18. The method as set forth in claim 1, wherein the circulation of said working fluid is effected by an induced thermosiphon.

19. The method as set forth in claim 18, wherein hydraulic pressure loss in operation is less than 1.5 times a quantity of a thermosiphon pressure.

20. The method as set forth in claim 18, wherein hydraulic pressure loss in operation is less than 1.0 times a quantity of a thermosiphon pressure.

21. The method as set forth in claim 1, further including a step of amalgamating intermittent renewable energy generating methods with the method of claim 1.

22. The method as set forth in claim 21, wherein said intermittent renewable energy generating methods include wind, solar and electrochemical methods.

23. A method for providing on demand power to an end user with a well system having an inlet well, an outlet well in a thermally productive geologic formation, comprising:

forming a closed loop with a power generation device operatively connecting said inlet well and said outlet well;

circulating a working fluid in said closed loop with a predetermined residency time to thermally load the circulating working fluid through conduction from said geologic formation;

modulating a flow rate of the thermally loaded working fluid within said closed loop for power generation based on user demand;

interconnecting said inlet well and said outlet well with a plurality of interconnecting sections in a predetermined pattern within said formation; and

selectively modulating circulation of said working fluid within predetermined sections of said plurality of interconnecting sections of said well system to oscillate a thermal output from the thermally charged working fluid about a characteristic predetermined potential thermal output capacity of said formation, where an averaged oscillated thermal output equals or is less than said characteristic predetermined potential thermal output capacity of said formation and where said characteristic predetermined potential thermal output capacity is determined based on a baseload thermal output of said working fluid flowing at a constant flow rate.

24. The method as set forth in claim 23, further including interconnecting said inlet well and said outlet well with an interconnecting section in fluid communication, at least part of said interconnecting section being disposed for conduction in said thermally productive geologic formation.

25. The method as set forth in claim 23, wherein said geologic formation is selected from a group comprising:

a geothermal formation, a low permeability formation, a sedimentary formation, a volcanic formation, a high temperature formation, a variable permeability formation and combinations thereof.

26. The method as set forth in claim 23, wherein said well system includes pre-existing wells.

27. The method as set forth in claim 26, wherein said geologic formation includes at least one of hot dry impermeable rock, naturally fissured, fractured or cracked rock, synthetically fissured, fractured or cracked rock and combinations thereof.

28. The method as set forth in claim 24, wherein said interconnecting section is at least one of cased, uncased, lined, chemically treated, chemically sealed, thermally sealed, includes single pipe, coaxial pipe and combinations thereof in a continuous or discontinuous configuration.

29. The method as set forth in claim 23, wherein said inlet well and said outlet well are co-located.

30. The method as set forth in claim 23, wherein said interconnecting sections are arranged at least one of:

symmetrically relative to adjacent interconnecting sections;
asymmetrically relative to adjacent interconnecting sections;
in interdigital relation to adjacent interconnecting sections;
in coplanar relation to adjacent interconnecting sections;
in parallel planar relation to adjacent interconnecting sections;
in isolated or grouped networks; and
combinations thereof.

31. The method as set forth in claim 23, further including a step of providing at least one of a plurality of closed loops with the outlet wells of adjacent loops selectively connected to the inlet wells of additional wells, the inlet wells of adjacent wells commonly connected, the outlet wells of adjacent wells commonly connected and combinations thereof.

32. The method as set forth in claim 31, further including a step selectively modulating circulation of said working fluid within predetermined loops of said plurality of closed loops of said well system to oscillate thermal output from thermally charged working fluid about the characteristic predetermined potential thermal output capacity, where the averaged oscillated thermal output substantially equates with said predetermined potential thermal output capacity.

33. The method as set forth in claim 31, wherein the selective connection comprises valved connection with temperature monitoring.

34. The method as set forth in claim 31, wherein the selective connection comprises a daisy chain connection.

35. The method as set forth in claim 34, wherein said daisy chain connection is at least one of continuous, intermittent and combinations thereof.

36. The method as set forth in claim 23, further including a step of amalgamating said method with intermittent renewable energy generating methods.

37. The method as set forth in claim 36, wherein said intermittent renewable energy generating methods include wind, solar and electrochemical methods.

38. A method for providing on demand power to an end user, comprising:

providing a well arrangement comprising an inlet well, an outlet well and an interconnecting section between said inlet well and said outlet well and being disposed within a geologic formation having a characteristic predetermined potential thermal output capacity, said geologic formation having a temperature of at least 90°C;

connecting said outlet well to a power generation device to recover energy from the well arrangement in a closed loop between the inlet and outlet wells and the power generation device; and

circulating a working fluid within said closed loop at varying flow rates to oscillate thermal output about the characteristic predetermined potential thermal output capacity, to produce on demand power where an average thermal output equals or is less than the predetermined potential thermal output capacity, and where said characteristic predetermined potential thermal output capacity is determined based on a baseload thermal output of said working fluid flowing at a constant flow rate.

39. The method of claim 1, wherein a capacity factor based on an averaged oscillated thermal output divided by said characteristic predetermined potential thermal output capacity of said geologic formation is greater than eighty percent.

40. The method of claim 23, wherein a capacity factor based on an averaged oscillated thermal output divided by said characteristic predetermined potential thermal output capacity of said formation is greater than eighty percent.

41. The method of claim 38, wherein a capacity factor based on an averaged oscillated thermal output divided by said characteristic predetermined potential thermal output capacity of said geologic formation is greater than eighty percent.