CLAIMS

1. A modular energy system controllable to supply power to a load, comprising:

three arrays, each array comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter;

a charge port configured to conduct a DC or single phase AC charge signal; and

routing circuitry connected between the charge port and the three arrays, wherein the routing circuitry is controllable to selectively route the DC or single phase AC charge signal to each of the three arrays.

2. The system of claim 1, further comprising a control system communicatively coupled with the routing circuitry, wherein the control system is configured to control the routing circuitry to selectively route the DC or single phase AC charge signal to each of the three arrays.

3. The system of claim 2, wherein the control system is communicatively coupled with each module of the three arrays and is configured to control the converter of each module to charge each module.

4. The system of claim 3, wherein the control system is configured to control the converters of each module according to a pulse width modulation or hysteresis technique.

5. The system of claim 3, wherein each module comprises monitor circuitry configured to monitor status information of the module, wherein each module is configured to output the status information to the control system, and wherein the control system is configured to control the converter of each module based on the status information.

6. The system of claim 5, wherein the status information relates to temperature and state of charge of the module, and wherein the control system is configured to control the converter of each module to balance temperature and state of charge of all modules of the arrays.

7. The system of claim 2, wherein the routing circuitry comprises a plurality of unidirectional solid-state relays controllable by the control system to selectively route the DC charge signal to each of the three arrays.

~~8. The system of claim 7, wherein the unidirectional solid-state relays are thyristors.~~

~~9. The system of claim 2, wherein the routing circuitry comprises a first port coupled with a DC+ line, a second port coupled with a DC- line, a third port coupled with a first array, a fourth port coupled with a second array, and a fifth port coupled with a third array, and comprises:~~

~~a first thyristor coupled between the first port and the third port;~~

~~a second thyristor coupled between the first port and the fourth port;~~

~~a third thyristor coupled between the fourth port and the second port; and~~

~~a fourth thyristor coupled between the fifth port and the second port,~~

~~wherein the thyristors are controllable by the control system to selectively route the DC charge signal at the first port to either the third or fourth port, and to selectively route a signal at the fourth or fifth port to the second port.~~

~~10. The system of claim 9, wherein the routing circuitry comprises a sixth port coupled with a first AC line, a seventh port coupled with a second AC line, and comprises:~~

~~a first diode coupled between the seventh port and the first and second thyristors;~~

~~a second diode coupled between the sixth port and the first and second thyristors;~~

~~a third diode coupled from the third and fourth thyristors to the sixth port; and~~

~~a fourth diode coupled from the third and fourth thyristors to the seventh port.~~

~~11~~8. The system of claim 2, wherein the routing circuitry comprises a plurality of bidirectional solid-state relays controllable by the control system to selectively route the DC or single phase AC charge signal to each of the three arrays.

~~12. The system of claim 11, wherein the bidirectional solid-state relays are triacs.~~

~~13. The system of claim 2, wherein the routing circuitry comprises a first port configured to couple with a DC+ charge signal or a single phase AC line charge signal, a second port configured to couple with a DC- charge signal or a single phase AC neutral signal, a third port coupled with a first array, a fourth port coupled with a second array, and a fifth port coupled with a third array, and comprises:~~

~~a first triac coupled between the first port and the third port;~~

~~a second triac coupled between the first port and the fourth port;~~

~~a third triac coupled between the fourth port and the second port; and~~

~~a fourth triac coupled between the fifth port and the second port.~~

~~14. The system of claim 13, wherein the triacs are controllable by the control system to, in operation in a DC charge state, selectively route the DC charge signal at the first port to either the third or fourth port, and to selectively route a signal at the fourth or fifth port to the second port, and~~

~~wherein the triacs are controllable by the control system to, in operation in a positive single phase AC charge state, selectively route the AC line charge signal at the first port to either the third or fourth port, and to selectively route a signal at the fourth or fifth port to the second port and, in operation in a negative single phase AC charge state, selectively route a signal at the~~

~~second port two either the fourth or fifth port, and to selectively route a signal at the third or fourth port to the first port.~~

~~15~~9. The system of claim 2, wherein the charge port is configured to conduct a three phase AC charge signal, and the routing circuitry comprises a plurality of bidirectional solid-state relays controllable by the control system to selectively route the DC or single phase AC charge signal to each of the three arrays.

~~16. The system of claim 15, wherein the plurality of bidirectional solid-state relays comprises triacs.~~

~~17. The system of claim 15, wherein the routing circuitry comprises a first port configured to receive a DC or AC charge signal, a second port configured to receive an AC charge signal, and a third port configured to receive a DC or AC charge signal, and further comprises:~~

~~a first triac coupled between the first port and a first line connectable to a first array of the three arrays;~~

~~a second triac coupled between the second port and a second line connectable to a second array of the three arrays;~~

~~a third triac coupled between the third port and a third line connectable to a third array of the three arrays;~~

~~a fourth triac coupled between the first and second lines; and~~

~~a fifth triac coupled between the second and third lines.~~

~~18~~10. The system of any of claims 7-~~17~~9, further configured to selectively disconnect all modules and motors from a charge source.

~~19. The system of any of claims 1-18, wherein the three arrays are interconnected by at least one interconnection module.~~

~~20. The system of claim 19, wherein the control system is configured to control the at least one interconnection module to supply voltage for at least one auxiliary load when the system is in a charge state.~~

~~21~~11. The system of any of claims 1-~~18~~10, wherein the three arrays are interconnected in a delta series configuration.

~~22~~12. The system of any of claims 1-~~18~~10, wherein the load is a six phase load, the three arrays are a first set of arrays, and the system further comprises a second set of arrays comprising an additional three arrays of modules, wherein the system is configured to charge the first and second set of arrays in parallel.

~~23~~13. The system of any of claims 1-~~14~~8, wherein the charge port is a first charge port, the system further comprising a second charge port configured to receive a three-phase charge signal.

~~24~~14. The system of claim ~~23~~13, wherein the first and second charge ports are integrated in the same user accessible location.

~~25~~15. The system of claim ~~23~~13, wherein the routing circuitry is connected to lines from the second charge port.

~~26~~16. The system of any of claims 1-~~25~~15, comprising a plurality of switches coupled between a first module of each array and the load, wherein the plurality of switches are controllable to disconnect the load from the three arrays.

~~27~~17. The system of any of claims 1-~~26~~16, wherein the three arrays are of a first subsystem of the system configured to provide three-phase power to a first load, the system further comprising a second subsystem configured to provide three-phase power to a second load, wherein the second subsystem comprises three arrays each comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules of the second subsystem comprises an energy source and a converter,

wherein the first and second subsystems are coupled together by a first plurality of switches such that the first and second subsystems are electrically connectable in parallel for charging.

~~28~~18. The system of claim ~~27~~17, further comprising a third subsystem configured to provide three-phase power to a third load, wherein the third subsystem comprises three arrays each comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules of the third subsystem comprises an energy source and a converter,

wherein the first and third subsystems are coupled together by a second plurality of switches such that the first and third subsystems are electrically connectable in parallel for charging.

~~29~~19. A method of charging a modular energy system configured in accordance with any of claims 1-~~28~~18, comprising:

controlling the modular energy system while a charge signal is applied to charge the modular energy system and to balance at least one operating characteristic of the system.

~~30~~20. The method of claim ~~29~~19, wherein the at least one operating characteristic is temperature.

~~31~~21. The method of claim ~~29~~19, wherein the charge signal is a three-phase charge signal, a single phase charge signal, or a direct current (DC) charge signal.

~~32~~22. The method of claim ~~29~~19, wherein the modular energy system is controlled to maintain a power factor of the system within a threshold of unity.

~~33~~23. The method of claim ~~29~~19, wherein controlling the modular energy system comprises controlling converters of modules of the energy system.

~~34~~24. A control system for a modular energy system configured in accordance with any of claims 1-~~28~~18.

~~35~~25. A computer readable medium comprising a plurality of instructions that, when executed by processing circuitry, cause the processing circuitry to control charging for a modular energy system configured in accordance with any of claims 1-~~28~~18.

~~36. A modular energy system of an electric vehicle (EV), comprising:~~

~~a first subsystem configured to supply power to a first motor of the EV, the first subsystem comprising three arrays each comprising at least two first modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two first modules, wherein each of the first modules comprises an energy source and a converter;~~

a second subsystem configured to supply power to a second motor of the EV, the second subsystem comprising three arrays each comprising at least two second modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two second modules, wherein each of the second modules comprises an energy source and a converter; and

a plurality of switches configured to selectively connect the first and second subsystems for charging,

wherein a nominal output voltage of the first subsystem is greater than a nominal output voltage of the second subsystem.

37. The system of claim 36, wherein each array of the first subsystem comprises more modules than each array of the second subsystem.

38. The system of claim 36, wherein a nominal voltage of each first module is greater than a nominal voltage of each second module.

39. The system of claim 36, wherein the energy source of each first module is a battery of a first type, and the energy source of each second module is a battery of a second type, wherein the first type is different than the second type.

40. The system of claim 39, wherein the first type has a relatively greater energy density than the second type.

41. The system of claim 40, wherein the second type has a relatively greater C rate than the first type.

42. The system of any of claims 36-41, wherein the plurality of switches are configured to connect a first array of the first subsystem in parallel with a first array of the second subsystem, a second array of the first subsystem in parallel with a second array of the second subsystem, and a third array of the first subsystem in parallel with a third array of the second subsystem.

43. The system of claim 42, further comprising:

a charge port configured to conduct a DC or single phase AC charge signal; and

routing circuitry connected between the charge port and the subsystems, wherein the routing circuitry is controllable to selectively route the DC or single phase AC charge signal to each parallel connection of subsystem arrays.

44. The system of claim 43, further comprising a control system communicatively coupled with the routing circuitry and the plurality of switches, wherein the control system is configured to control the selective routing of the routing circuitry.

45. The system of claim 44, wherein the control system is communicatively coupled with the converters of each first module and each second module, and is configured to control the converters to charge each first and second module.

46. The system of any of claims 36-45, further comprising a third subsystem configured to supply power to a third motor of the EV, the third subsystem comprising three arrays each comprising at least two third modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two third modules, wherein each of the third modules comprises an energy source and a converter.

47. The system of claim 46, wherein the plurality of switches is a first plurality of switches, the system further comprising a second plurality of switches configured to selectively connect the second and third subsystems for charging.

48. The system of claim 47, wherein the maximum output voltage of the first subsystem is greater than the maximum output voltage of the third subsystem.

49. The system of claim 47, wherein the first motor is configured to power rear wheels of the EV, the second motor is configured to power a first front wheel of the EV, and the third motor is configured to power a second front wheel of the EV.

50. The system of claim 46, further comprising a fourth subsystem configured to supply power to a fourth motor of the EV, the fourth subsystem comprising three arrays each comprising at least two fourth modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two fourth modules, wherein each of the fourth modules comprises an energy source and a converter.

51. The system of any of claims 36-50, wherein the nominal output voltage of the first subsystem is a nominal peak line-to-line output voltage of the first subsystem, and the nominal output voltage of the second subsystem is a nominal peak line-to-line output voltage of the second subsystem.

52. A modular energy system controllable to supply power to a closed winding motor, comprising:

three arrays, each array comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter; and

~~a charge connector comprising a first port and a second port and configured to conduct a DC or single phase AC charge signal,~~

~~wherein a first charge path extends from the first port through a first and second winding of the motor, through a first array, and ends at the second port,~~

~~wherein a second charge path extends from the first port through the first winding and a third winding of the motor, through a second array, and ends at the second port, and~~

~~wherein a third charge path extends from the first port of the connector, bypasses the motor and passes through a third array, and ends at the second port.~~

~~53. The system of claim 52, further comprising a control system communicatively coupled with the modules of the three arrays, wherein the control system is configured to control the converter of each module to charge each module.~~

~~54. The system of claim 53, wherein the control system is configured to charge each of the three arrays concurrently with the DC charge signal.~~

~~55. The system of claim 53, wherein the control system is configured to charge two of the three arrays concurrently with the DC charge signal.~~

~~56. The system of claim 53, wherein the control system is configured to charge each of the three arrays sequentially with the DC charge signal.~~

~~57. The system of claim 53, wherein the control system is configured to charge each of the three arrays concurrently with the single phase AC charge signal.~~

~~58. The system of claim 53, wherein the control system is configured to charge two of the three arrays concurrently with the single phase AC charge signal.~~

~~59. The system of claim 53, wherein the control system is configured to charge each of the three arrays sequentially with the single phase AC charge signal.~~

~~60. The system of claim 53, wherein the control system is configured to charge along the first charge path and the second charge path concurrently such that fluxes generated on the first, second, and third windings of the motor are neutralized.~~

~~61. The system of claim 53, further comprising a three-phase charge connector connected to a plurality of switches, wherein the switches are controllable by the control system to selectively connect the three-phase charge connector to the three arrays.~~

~~62. The system of claim 53, wherein the control system is configured to control the converters of each module according to a pulse width modulation or hysteresis technique.~~

~~63. The system of claim 62, wherein each module comprises monitor circuitry configured to monitor status information of the module, wherein each module is configured to output the status information to the control system, and wherein the control system is configured to control the converter of each module based on the status information.~~

~~64. The system of claim 63, wherein the status information relates to temperature and state of charge of the module, and wherein the control system is configured to control the converter of each module to balance temperature and state of charge of all modules of the arrays.~~

~~65. The system of any of claims 52-64, wherein the three arrays are interconnected by at least one interconnection module.~~

66. The system of claim 65, wherein the control system is configured to control the at least one interconnection module to supply voltage for at least one auxiliary load when the system is in a charge state.

67. A charge source configured to charge an electric vehicle (EV), comprising:

a modular energy system comprising three arrays configured to generate power in at least three phases, each array comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter.

68. The charge source of claim 67, wherein the charge source is configured to connect to an external power supply to charge the energy sources of the modular energy system.

69. The charge source of claim 68, wherein the external power supply is a utility grid or a renewable energy source.

70. The charge source of claim 68, wherein the charge source is configured to charge the EV at a first rate, wherein the charge source is configured to be charged by the external power supply at a second rate, and wherein the first rate is greater than the second rate.

71. The charge source of claim 68, comprising:

monitor circuitry configured to detect a harmonic outputtable to the external power supply; and

a control system configured to control the converters of the modules to generate compensatory current to cancel the harmonic.

72. The charge source of claim 71, further comprising a DC/AC converter comprising a plurality of diodes for rectification.

73. The charge source of claim 67, configured to charge the EV with a DC charge signal, a single phase AC charge signal, or a three-phase AC charge signal.

74. The charge source of claim 67, wherein the EV comprises a battery pack comprising:

a modular energy system comprising three arrays configured to generate power in at least three phases, each array comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter.

75. A modular energy system controllable to supply power to an open winding motor, comprising:

a first subsystem comprising three arrays, each array comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter, wherein the first subsystem is connected to a three-phase charge connector; and

a second subsystem comprising three arrays, each array comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter,

wherein the first and second subsystems are configured to connect to the motor such that a first winding of the motor is connected between a first array of the first subsystem and a first array of the second subsystem, a second winding of the motor is connected between a second array of the first subsystem and a second array of the second subsystem, and a third winding of

the motor is connected between a third array of the first subsystem and a third array of the second subsystem.

76. The system of claim 75, wherein a first port of the three-phase charge connector is coupled to the first array of the first subsystem, a second port of the three-phase charge connector is coupled to the second array of the first subsystem, and a third port of the three-phase charge connector is coupled to the third array of the first subsystem, the system further comprising:

a first switch coupled between the first port and the second port;

a second switch coupled between the second port and the third port; and

a DC or single phase AC charge connector coupled with the third port and the third array of the second subsystem.

77. A modular energy system of an electric vehicle (EV), comprising:

three arrays, each array comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter,

wherein the three arrays are configured to provide three-phase power for a first electric motor configured to provide motive force for at least one wheel of the EV, and

wherein at least one module of the three arrays is configured to provide power to a second electric motor of an electric suspension or electric steering mechanism of the EV.

78. The system of claim 77, configured to provide power for two second electric motors of the EV.

79. The system of claim 77, configured to provide power for four second electric motors of the EV.

~~80. The system of claim 77, wherein the at least one module is the module of the three arrays in closest proximity to the second electric motor.~~

~~81. The system of claim 77, wherein the at least one module is configured as an interconnection module coupled with at least two of the three arrays.~~

~~82. The system of claim 77, comprising a plurality of interconnection modules coupled between the three arrays, wherein each interconnection module comprises an energy source and a converter, and the energy sources of the interconnection modules are connected in parallel.~~

~~83. The system of claim 82, wherein the at least one module is one of the plurality of interconnection modules.~~

~~84. The system of any of claims 77-83, further comprising an isolation converter, wherein the at least one module of the three arrays is configured to provide power to the second electric motor by way of the isolation converter.~~

~~85. The system of any of claims 77-83, wherein the converter of the at least one module is a first converter, and the at least one module comprises an isolation converter coupled with the energy source of the at least one module, wherein the at least one module is configured to provide power to the second electric motor from the energy source through the isolation converter.~~

~~86. The system of claim 85, wherein the isolation converter comprises:~~

~~a first DC-AC converter coupled with the energy source of the at least one module;~~

~~a transformer coupled with the DC-AC converter; and~~

a second DC-AC converter coupled with the transformer.

87. The system of any of claims 77-86, wherein the second electric motor is an electric actuator.

88. The system of any of claims 77-87, wherein the second electric motor is part of an electric suspension of the EV.

89. The system of any of claims 77-87, wherein the second electric motor is part of an electric steering mechanism of the EV.

90. The system of any of claims 77-89, wherein the three arrays are of a first subsystem of the system, and the system further comprises at least one additional subsystem configured to provide three-phase power for a third electric motor of the EV configured to provide motive force for at least one wheel of the EV, wherein the at least one additional subsystem comprises at least one additional module configured to provide power to a fourth electric motor of an electric suspension or electric steering mechanism of the EV.

91. A modular energy system of an electric vehicle (EV), comprising:

three arrays, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter,

wherein a chassis of the EV has a first axis and a perpendicular second axis in a horizontal plane of the EV, wherein a first dimension of the chassis along the first axis is relatively longer than a second dimension of the chassis along the second axis,

wherein the three arrays are arranged in a pack configured to fit within the chassis, and

wherein each module of the three arrays has a first dimension aligned along the first axis and a second dimension aligned along the second axis, wherein the second dimension of each module is relatively greater than the first dimension.

92. The system of claim 91, wherein, for each array, a majority of modules of the array are aligned along the first axis.

93. The system of claim 92, wherein, a first level of the arrays are arranged in staggered fashion at a first end of the pack.

94. The system of claim 93, wherein other levels of the arrays are aligned along the second axis.

95. The system of any of claims 93-94, further comprising three interconnection modules arranged in staggered fashion at a second end of the pack.

96. The system of any of claims 91-95, configured to provide three-phase power to a motor located adjacent the first end of the pack.

97. The system of claim 91, wherein the three arrays are of a first subsystem, the system further comprising a second subsystem comprising three arrays of modules arranged in symmetrically opposite fashion to the first subsystem.

98. The system of claim 97, further comprising three interconnection modules positioned between the first and second subsystems and aligned along the second axis.

99. A modular energy system of an electric vehicle (EV), comprising:

a first subsystem comprising three arrays configured to provide three-phase power to a first motor of the EV, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter; and

a second subsystem comprising three arrays configured to provide three-phase power to a second motor of the EV, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter,

wherein a chassis of the EV has a first axis and a perpendicular second axis in a horizontal plane of the EV, wherein a first dimension of the chassis along the first axis is relatively longer than a second dimension of the chassis along the second axis,

wherein the two subsystems are arranged in a pack configured to fit within the chassis, and

wherein each module of the two subsystems has a first dimension aligned along the first axis and a second dimension aligned along the second axis, wherein the second dimension of each module is relatively smaller than the first dimension.

100. The system of claim 99, wherein, for each array, a majority of modules of the array are aligned along the first axis.

101. The system of claim 100, each level of the arrays are aligned along the second axis.

102. The system of any of claims 99-101, further comprising three interconnection modules arranged in staggered fashion at a first end of the pack.

~~103. The system of any of claims 99-102, wherein the first and second subsystems are configured to output power for the first and second motors at a second end of the pack.~~

~~104. A modular energy system of an electric vehicle (EV), comprising:~~

~~a first subsystem comprising three arrays configured to provide three-phase power to a first motor of the EV, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter;~~

~~a second subsystem comprising three arrays configured to provide three-phase power to a second motor of the EV, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter; and~~

~~a third subsystem comprising three arrays configured to provide three-phase power to a third motor of the EV, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter,~~

~~wherein a chassis of the EV has a first axis and a perpendicular second axis in a horizontal plane of the EV, wherein a first dimension of the chassis along the first axis is relatively longer than a second dimension of the chassis along the second axis,~~

~~wherein the three subsystems are arranged in a pack configured to fit within the chassis, and~~

~~wherein each module of the first and second subsystems has a first dimension aligned along the first axis and a second dimension aligned along the second axis, wherein the second dimension of each module is relatively smaller than the first dimension.~~

~~105. The system of claim 104, wherein each module of the third subsystems has a first dimension aligned along the first axis and a second dimension aligned along the second axis, wherein the second dimension of each module is relatively greater than the first dimension.~~

~~106. The system of claim 104, wherein the first subsystem is positioned on a left side of the EV in the second subsystem is positioned on a right side of the EV.~~

~~107. The system of claim 106, wherein the third subsystem is to the rear of the first and second subsystems.~~

~~108. The system of claim 107, wherein the first subsystem is configured to power a first motor for a front left wheel of the EV, the second subsystem is configured to power a second motor for a front right wheel of the EV, and the third subsystem is configured to power a third motor for rear wheels of the EV.~~

~~109. The system of any of claims 104-108, further comprising a plurality of interconnection modules positioned between the first and second subsystems.~~

~~110. The system of any of claims 104-109, wherein each array of the first and second subsystems is aligned along the second axis.~~

~~111. The system of any of claims 104-110, wherein each level of modules of the first and second subsystems is aligned along the first axis.~~

~~112. The system of any of claims 104-111, wherein a majority of modules of each array of the third subsystem subsystems are aligned along the first axis.~~

~~113. The system of any of claims 104-112, wherein a majority of levels of modules of the third subsystem are aligned along the second axis.~~

~~114. The system of claim 113, wherein a first level of modules of the third subsystem are arranged in staggered fashion.~~

~~115. A modular energy system of an electric vehicle (EV), comprising:~~

~~four subsystems configured to provide three-phase power to four motors of the EV, each subsystem comprising three arrays, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter,~~

~~wherein a chassis of the EV has a first axis and a perpendicular second axis in a horizontal plane of the EV, wherein a first dimension of the chassis along the first axis is relatively longer than a second dimension of the chassis along the second axis,~~

~~wherein the four subsystems are arranged in a pack configured to fit within the chassis, and~~

~~wherein each module of the first and second subsystems has a first dimension aligned along the first axis and a second dimension aligned along the second axis, wherein the second dimension of each module is relatively smaller than the first dimension.~~

~~116. The system of claim 115, further comprising a plurality of interconnection modules aligned along the first axis.~~

~~117. The system of claim 115, wherein the four subsystems are a first subsystem, a second subsystem, a third subsystem, and a fourth subsystem, and wherein the four motors are a first motor, a second motor, a third motor, and a fourth motor, the system further comprising:~~

a fifth subsystem configured to provide three-phase power to a fifth motor of the EV, the fifth subsystem comprising three arrays, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter; and

a sixth subsystem configured to provide three-phase power to a sixth motor of the EV, the sixth subsystem comprising three arrays, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter.

118. The system of claim 117, wherein the chassis is a first chassis and the pack is a first pack, and the fifth and sixth subsystems are arranged in a second pack configured to fit within a second chassis of the EV movably coupled to the first chassis.

119. A modular energy system of an electric vehicle (EV), comprising:

four subsystems configured to provide three-phase power to four motors of the EV, each subsystem comprising three arrays, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter,

wherein a chassis of the EV has a first axis and a perpendicular second axis in a horizontal plane of the EV, wherein a first dimension of the chassis along the first axis is relatively longer than a second dimension of the chassis along the second axis,

wherein the four subsystems are arranged in a pack configured to fit within the chassis, and

wherein each module of the first and second subsystems has a first dimension aligned along the first axis and a second dimension aligned along the second axis, wherein the second dimension of each module is relatively greater than the first dimension.

~~120. The system of claim 119, further comprising a plurality of interconnection modules aligned along the second axis.~~

~~121. The system of claim 119, wherein the four subsystems are a first subsystem, a second subsystem, a third subsystem, and a fourth subsystem, and wherein the four motors are a first motor, a second motor, a third motor, and a fourth motor, the system further comprising:~~

~~a fifth subsystem configured to provide three-phase power to a fifth motor of the EV, the fifth subsystem comprising three arrays, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter; and~~

~~a sixth subsystem configured to provide three-phase power to a sixth motor of the EV, the sixth subsystem comprising three arrays, each array comprising at least two levels of modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter.~~

~~122. The system of claim 121, wherein the chassis is a first chassis and the pack is a first pack, and the fifth and sixth subsystems are arranged in a second pack configured to fit within a second chassis of the EV movably coupled to the first chassis.~~