Claims

1. A power transmission system, comprising:

(a) a power source,

(b) one or more load(s),

(c) a capacitive transmission line having:

(i) a first conductor connected to the power source but not to the one or more load(s),

(ii) a second conductor connected to the one or more load(s) but not to the power source, and

(iii) a dielectric material between the first conductor and the second conductor, and

(d) an impedance management system for modifying an impedance of the capacitive transmission line by switching the impedance between at least two states, wherein in a first state the capacitive transmission line has a first impedance and functions as a capacitive transmission line, and wherein in a second state the capacitive transmission line has a second impedance, different to the first impedance, and functions as a capacitive transmission line.

2. A power transmission system as claimed in claim 1, wherein the impedance management system is for modifying the impedance of the capacitive transmission line by switching the impedance between at least three states, wherein in each state the capacitive transmission line has an impedance different to the impedance of each of the other two states and functions as a capacitive transmission line.

3. A power transmission system as claimed in claim 1 or claim 2, wherein the one or more load(s) is a plurality of loads.

4. A power transmission system as claimed in any one of claims 1 to 3, wherein the impedance management system comprises:

(a) a receiver for receiving data about the one or more load(s) and/or about the power transmission system,

(b) a processor for determining a target impedance of the capacitive transmission line based on the data, and

(c) a controller for modifying the impedance of the capacitive transmission line in accordance with the target impedance.

5. A power transmission system as claimed in any one of claims 1 to 4, wherein the impedance management system is for modifying an overall impedance of the capacitive transmission line or one or more local impedance(s) at one or more point(s) along the capacitive transmission line.

6. A power transmission system as claimed in any one of claims 1 to 5, wherein the impedance management system is for modifying the impedance of the capacitive transmission line in response to a change in the one or more load(s).

7. A power transmission system as claimed in any one of claims 1 to 6, wherein the impedance management system is for modifying the impedance of the capacitive transmission line in anticipation of a change in the one or more load(s).

8. A power transmission system as claimed in any one of claims 1 to 7, wherein the capacitive transmission line comprises one or more electrical connection(s) each of which is between the first conductor and the second conductor or in series with the first conductor or the second conductor, and each of which is configured to be individually controlled.

9. A capacitive transmission line for a power transmission system as claimed in any one of claims 1 to 8, comprising:

(a) a first conductor for connection to a power source but not to one or more load(s),

(b) a second conductor for connection to the one or more load(s) but not to the power source,

(c) a dielectric material between the first conductor and the second conductor, and

(d) one or more electrical connection(s) each of which is between the first conductor and the second conductor or in series with the first conductor

or the second conductor, wherein each of the one or more electrical connection(s) is configured to be individually controlled, such that an impedance of the capacitive transmission line can be switched between at least two states, wherein in a first state the capacitive transmission line has a first impedance and functions as a capacitive transmission line, and wherein in a second state the capacitive transmission line has a second impedance, different to the first impedance, and functions as a capacitive transmission line.

10. A capacitive transmission line as claimed in claim 9, wherein the one or more electrical connection(s) is a plurality of electrical connections.

11. A capacitive transmission line as claimed in claim 10, wherein there are at least three electrical connections.

12. A capacitive transmission line as claimed in any one of claims 9 to 11, wherein each of the one or more electrical connection(s) comprises one capacitor, one inductor, or one resistor which is individually controllable via a switch.

13. A capacitive transmission line as claimed in any one of claims 9 to 11, wherein each of the one or more electrical connection(s) comprises a plurality of capacitors, a plurality of inductors, a plurality of resistors, or a plurality of electrical components each of which is a capacitor, an inductor, or a resistor, which are collectively controllable via a switch.

14. An impedance management system for a power transmission system as claimed in any one of claims 1 to 8, comprising:

(a) a receiver for receiving data about one or more load(s) and/or about the power transmission system,

(b) a processor for determining a target impedance of a capacitive transmission line based on the data, and

(c) a controller for modifying an impedance of the capacitive transmission line in accordance with the target impedance,

wherein the controller is for modifying the impedance of the capacitive transmission line by switching the impedance between at least two states, wherein in a first state the capacitive transmission line has a first impedance and functions as a capacitive transmission line, and wherein in a second state the capacitive transmission line has a second impedance, different to the first impedance, and functions as a capacitive transmission line.

15. An impedance management system as claimed in claim 14, wherein the controller is for modifying the impedance of the capacitive transmission line by switching the impedance between at least three states, wherein in each state the capacitive transmission line has an impedance different to the impedance of each of the other two states and functions as a capacitive transmission line.

16. An impedance management system as claimed in claim 14 or claim 15, wherein the one or more load(s) is a plurality of loads.

17. A method of modifying an impedance of a capacitive transmission line having an impedance, comprising:

(a) receiving data about one or more load(s) connected to the capacitive transmission line and/or about a power transmission system the capacitive transmission line forms part of,

(b) determining a target impedance of the capacitive transmission line based on the data,

(c) comparing the impedance to the target impedance, and

(d) modifying the impedance to decrease a difference between the impedance and the target impedance,

wherein the impedance of the capacitive transmission line is modified by switching the impedance between at least two states, wherein in a first state the capacitive transmission line has a first impedance and functions as a capacitive transmission line, and wherein in a second state the capacitive transmission line has a second impedance, different to the first impedance, and functions as a capacitive transmission line.

18. A method of modifying an impedance of a capacitive transmission line as claimed in claim 17, wherein the impedance of the capacitive transmission line is modified by switching the impedance between at least three states, wherein in each state the capacitive transmission line has an impedance different to the impedance of each of the other two states and functions as a capacitive transmission line.

19. A method of modifying an impedance of a capacitive transmission line as claimed in claim 17 or claim 18, wherein the capacitive transmission line is a capacitive transmission line according to any one of claims 9 to 13.

20. A wireless charging station for an electric vehicle comprising a power transmission system as claimed in any one of claims 1 to 8.

21. A vehicle park comprising a wireless charging station as claimed in claim 20.