CLAIMS

1. A process for the generation of electricity, the process comprising the steps of:

- extracting a warm saline stream from a geothermal formation, and

- converting latent osmotic energy present in the stream into electricity by passage through an osmotic power unit in which the stream is passed over one side of a semi-permeable membrane which permits the passage of water but not the passage of salts, an aqueous stream of lower salinity than the stream being passed over the other side of the membrane, and in which

the temperature of the warm saline stream is reduced before the stream enters the osmotic power unit by passage through a thermal power unit in which thermal energy present in the stream is converted into electricity.

2. A process according to Claim 1, in which the temperature of the warm saline stream is reduced by passing the stream through a heat exchanger.

3. A process according to Claim 1 or 2, in which the warm saline stream has a temperature of at least 45°C.

4. A process according to Claim 3, in which the warm saline stream has a temperature of at least 55°C.

5. A process according to any preceding claim, in which the warm saline stream has a salt content of at least 10% wt.

6. A process according to Claim 5, in which the warm saline stream has a salt content of at least 15% wt.

7. A process according to any preceding claim, in which the aqueous stream of lower salinity is sea water, fresh water or brackish water obtained from a river or lake, or waste water obtained from an industrial or municipal source.

8. A process according to any preceding claim, in which the osmotic power unit contains more than one osmosis unit each comprising a semipermeable membrane which permits the passage of water but not the passage of salts.

9. A process according to Claim 8, in which an output stream from one osmosis unit is used as an input stream for a second osmosis unit.

10. A power generation system comprising:

- a connection to a warm saline stream extracted from a geothermal formation,

- an osmotic power unit arranged to generate electricity through Pressure Retarded Osmosis (PRO) using the difference in salinity between a high-salinity input stream and a low-salinity input stream, and

- a thermal power unit arranged to generate electricity by extracting thermal energy from the warm saline stream thereby producing a cooled output stream, and in which

the system is arranged such that the cooled output stream of the thermal power unit is passed to the osmotic power unit for use as the high-salinity input stream.

11. A process for the generation of electricity, which comprises extracting a warm saline stream from a geothermal formation, and:

(a) converting thermal energy present in the stream into electricity; and

(b) converting latent osmotic energy present in the stream into electricity by passage through an osmotic power unit in which the stream is passed over one side of a semi-permeable membrane which permits the passage of water but not the passage of salts, an aqueous stream of lower salinity than the stream being passed over the other side of the membrane.

12. A process according to Claim 11, in which step (a) is carried out before step (b).

13. A process according to Claim 11 or 12, in which step (a) is carried out by passing the stream through a heat exchanger.

14. A process according to any of Claims 11 to 13, in which the warm saline stream has a temperature of at least 45°C.

15. A process according to Claim 14, in which the warm saline stream has a temperature of at least 55°C.

16. A process according to any of Claims 11 to 15, in which the warm saline stream has a salt content of at least 10% wt.

17. A process according to Claim 16, in which the warm saline stream has a salt content of at least 15% wt.

18. A process according to any of Claims 11 to 17, in which the aqueous stream of lower salinity used in step (b) is sea water, fresh water or brackish water obtained from a river or lake, or waste water obtained from an industrial or municipal source.

19. A process according to any of Claims 11 to 18, in which the osmotic power unit contains more than one osmosis unit each comprising a semipermeable membrane which permits the passage of water but not the passage of salts.

20. A process according to Claim 19, in which an output stream from one osmosis unit is used as an input stream for a second osmosis unit.