CLAIMS:

1. A system for the extraction of energy from an underwater flow stream in a body of water, the system comprising:
a support frame (12) comprising a plurality of receptacles (16) for mounting functional modules on the support frame (12), the plurality of receptacles (16) arranged to form a horizontally-distributed two-dimensional array (13) on the support frame (12); and
a plurality of vertical axis turbine units (20) configured to be interchangeably mounted in the receptacles (16).

2. The system according to claim 1, comprising at least one functional module configured to be interchangeably mounted in the receptacles (16).

3. The system according to claim 1 or claim 2, wherein the plurality of vertical axis turbine units (20) is arranged substantially in a horizontal plane.

4. The system according to claim 1 or claim 2, wherein the plurality of vertical axis turbines (20) is arranged with a subset of the vertical axis turbines vertically offset with respect to others of the plurality of vertical axis turbines (20).

5. The system according to any preceding claim wherein the support frame (12) has a triangular-shaped base, and wherein receptacles (16) are adjacent to each side of the triangular-shaped base.

6. The system according to any preceding claim, wherein one or more receptacles (16) comprises an energy storage module, an accumulator cell module, a hydrogen fuel cell module and/or a control module.

7. The system according to any preceding claim wherein the support frame (12) and plurality of vertical axis turbines units (20) form an integrated assembly configured to be towed to an installation and/or lowered to the bed of the body of water.

8. The system according to any preceding claim, wherein the system comprises at least one flow deflector assembly (40) operable to controllably adjust the flow into or out of the array of vertical axis turbines (20).

9. The system according to claim 8, wherein the at least one flow deflector assembly (40) is operable to shut off the flow entering or leaving the array in response to a control signal from a control module (70).

10. The system according to claim 8 or claim 9, wherein the at least one flow deflector assembly (40) comprises a failsafe close mechanism, which is operable to be actuated if the flow stream exceeds a velocity threshold.

11. The system according to any of claims 8 to 10, wherein the at least one flow deflector assembly (40) is a horizontally oriented flow deflector assembly or a vertically oriented flow deflector assembly.

12. The system according to any of claims 8 to 11, wherein the at least one flow deflector assembly (40) is configured to be operated in dependence on a control signal from a control module (70) of the apparatus.

13. The system according to claim 12, wherein the control module (70) is configured to generate the control signal in dependence on acquired flow condition and/or operational data, wherein the acquired flow condition and/or operational data comprises data selected from one or more of: flow velocity; rotational speed; torque; vibration data; energy output and/or temperature data.

14. A method of assembling a system for the extraction of energy from an underwater flow stream in a body of water, the method comprising:
providing a support frame (12) comprising a plurality of receptacles (16) for mounting functional modules on the support frame (12), the plurality of receptacles (16) arranged to form a horizontally-distributed two-dimensional array (13) on the support frame (12);
mounting a plurality of vertical axis turbine units (20) or a plurality of vertical axis turbine units (20) and one or more functional modules in the receptacles (16);
wherein the plurality of vertical axis turbine units (20) and/or plurality of functional modules is interchangeably mountable in the receptacles (16).

15. A method of extracting energy from an underwater flow stream in a body of water, using the system according to any one of claims 1 to 13.

16. A method of servicing an energy extraction system for an underwater flow stream in a body of water comprising:
providing the system of any of claims 1 to 13 on the bed of a body of water;
accessing a receptacle on the support frame (12); and
releasing a vertical axis turbine unit (20) or a functional module from the receptacle (16).

17. A modular system for the extraction of energy from an underwater flow stream in a body of water, the system comprising:
a support frame (12) comprising a plurality of receptacles (16) for mounting functional modules on the support frame (12), the plurality of receptacles (16) arranged to form a horizontally-distributed two-dimensional array (13) on the support frame (12);
a plurality of vertical axis turbine units (20); and
a plurality of functional modules;
wherein the plurality of vertical axis turbine units (20) and the plurality of functional modules are interchangeably mountable in the receptacles (16).