



[BioPower Systems Pty. Ltd](#) are looking to develop biomimicry technologies based on nature's mechanisms for survival and energy conversion in an ocean environment. They are attempting to mimic nature to develop both [ocean wave](#) and [tidal](#) energy systems.

The technology is based on 3.8 Billion years of evolutionary optimization in nature's ocean laboratory. The resulting systems move and sway in tune with the forces of the ocean, and naturally streamline when extreme conditions prevail. This will apparently lead to low design thresholds and associated low costs.



From their website BioPower Systems say, "The wave energy conversion system, bioWAVE™, is based on the swaying motion of sea plants in the presence of ocean waves. The

hydrodynamic interaction of the blades with the oscillating flow field is designed for maximum energy absorption. This system has numerous advantages over other wave energy devices. For example, the bioWAVE™ is the only wave energy system that captures a wide swath of incident wave energy without using a large rigid structure. It is also the only such device that absorbs energy over the full water depth and continually self-oriens with the wave direction. In extreme wave conditions, including hurricanes, the bioWAVE™ is automatically triggered to cease operating and assume a safe position lying flat against the seabed. This is achieved by back-driving the O-DRIVE™ generator and it effectively eliminates exposure to extreme forces, allowing for lower design tolerances and substantial cost savings. Systems are being developed for 500kW, 1000kW and 2000kW capacities to match conditions in various locations.”



Due to the single point of rotation, this device can align with the flow in any direction, and can assume a streamlined configuration to avoid excess loading in extreme conditions. Systems are being developed for 500kW, 1000kW and 2000kW capacities to match conditions in various locations.”

“The tidal energy conversion system, bioSTREAM™, is based on the highly efficient propulsion of Thunniform mode swimming species, such as shark, tuna, and mackerel. The motions, mechanisms, and caudal fin hydrofoil shapes of such species have been optimised by natural selection and are known to be up to 90% efficient at converting body energy into propulsive force. The bioSTREAM™ mimics the shape and motion characteristics of these species but is a fixed device in a moving stream. In this configuration the propulsion mechanism is reversed and the energy in the passing flow is used to drive the device motion against the resisting torque of the O-DRIVE™ electrical generator.

Biomimicry may well be the way of future clean renewable energy!