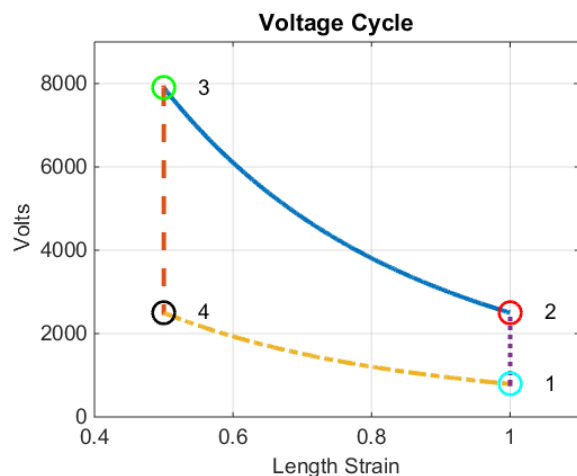


Ocean Observing Summary Slide:

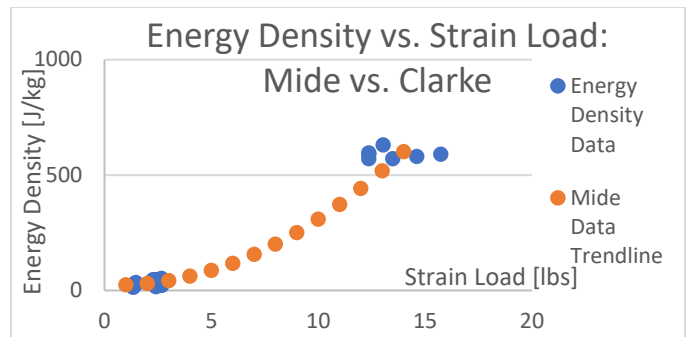
The team at Midé is excited to propose a novel wave energy harvester that is portable, reliable, and robust. Our system is a natural fit to extend deployments of unmanned marine vehicles. Midé’s goal is to fill a niche market where we can provide independent standalone equipment that will integrate seamlessly with existing technologies and vehicles to provide increased range and independence. We plan to achieve this using an electroactive polymer (EAP) based generator.

Electroactive Polymer Technology:

Fundamentally EAP is very simple. Two carbon imbedded electrode polymers separated by a dielectric material creates a capacitor. When stressed, the modulus of elasticity of the materials deform the capacitor either drawing the electrodes together or pushing them apart. This results in a varying capacity between the two electrodes. This phenomenon can be used to directly convert mechanical energy to electrical by modifying this response to create an electron pump. The figure below shows this harvesting cycle.

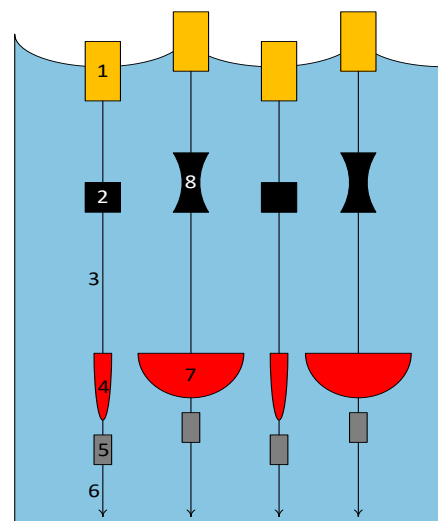


The energy that can be extracted from this cycle is surprisingly high, with typical max efficiencies exceeding 50%, and is directly related to material strain, i.e. capacitance change. The figure below demonstrates this trend.



Wave Harvesting System:

Midé aims to use this energy extraction method to create a wave harvesting system that can be integrated into preexisting autonomous systems, with an initial target of buoys and floats. This system can be integrated into teatherd anchor lines, or used with a sea anchor drogue system as seen in the following illustration.



Market Strategy:

Our market strategy is to create a standalone, seamlessly integrated power system that can be equipped on any existing autonomous buoy or float. Our goal is to create a symbiotic relationship with the existing blue economy promoting and assisting others by addressing their need for more energy.

