

The Magnus Effect and the Flettner Rotor: Potential Application for Future Oceanic Shipping

Peter Nuttall & John Kaitu'u

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ABSTRACT

Shipping is the lifeline of the Pacific. All current sea-transport options are fossil fuel powered and increasingly unsustainable. Globally, a range of renewable energy technologies is emerging with application in commercial shipping, including wind, solar and bio- fuels/gases. Such technologies have, to date, received little attention in the development of alternative energy solutions for Oceania, despite transport being the largest user of fossil fuels by Pacific Island Countries (PICs) and exploration of appropriate technologies for PIC sea-transport is currently embryonic. Anton Flettner invented and proved the Flettner Rotor that utilises the Magnus effect for propulsion in the 1920s as an effective method of reducing fuel use and increasing ship stability for commercial blue water shipping. The then low cost of fossil fuels and the emerging diesel ship propulsion engineering did not see the idea progress past the initial prototypes. The technology was briefly revisited in the 1980s. In the past decade a number of leading shipping designers and researchers have begun seriously re-investigating modern application of Flettner technology with impressive results. This technical review documents the literature of this technology to make it available to researchers seeking potential means for reducing Oceanic shipping costs for both transport and fishing at all levels of vessel size.

Keywords: Wind Energy Technology, Pacific Shipping, Climate Change Adaptation, Sustainable Transport, Flettner Rotor, Magnus Effect.