Automatons Immersed in Ocean Currents for Transformation of Biomass into Fuel

Lucio Cañete Arratia[1(✉)], Felisa Córdova[2], and Andrés Pérez de Arce[3]

[1] Universidad de Santiago de Chile, Av. Ecuador 3769, Santiago de Chile, Chile
lucio.canete@usach.cl
[2] Universidad Finis Terrae, Av. Pedro de Valdivia 1509, Santiago de Chile, Chile
fcordova@uft.cl
[3] Trade Plus S.A., Carlos Vildósola 279, Santiago de Chile, Chile
andresperezdearce@gmail.com

Abstract. When observing the Chilean sea from both biotic and mechanical perspective, oceanographers note that the Humboldt Current carries abundant biomass and that the movement of the water itself has the capacity to do work. Taking advantage of these two qualities of the ocean current, this article exposes the sketch of an automated device, the computational simulation when it was conceived and its mathematical model to make efficient the capture of biomass that will be processed, stored and dispatched as biodiesel. Said submerged automaton has a structural configuration that was outlined by cybernetic design resulting in a body that carries out the transformation process by itself, which starts on the side that faces the current with its content of biomass. This raw material is trapped thanks to an intelligent system that informs the reactor about the relative importance of the state variables that its body can control, stimulating those swimming organisms to move in the desired direction. The captured biomass begins its process until it becomes biodiesel by virtue of the mechanical energy provided by the same flow of seawater that affects the reactor. The rear part of the reactor releases both incident water and by-products into the sea without harmful environmental consequences. Some users of this new type of device are armies in time of conflict and merchant marines during algae bloom.

Keywords: Ocean current · Biomass · Mathematical model · Automated reactor · Biodiesel · Cybernetic design

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