

Blockchain for LBG Maritime Energy Contracting and Value Chain Management: A Green Shipping Business Model for Seaports

Robert PHILIPP^{1,2*}

¹*Hochschule Wismar, University of Applied Sciences: Technology, Business and Design, Wismar Business School, Philipp-Müller-Str. 14, 23966 Wismar, Germany*

²*Tallinn University of Technology, School of Business and Governance: Department of Business Administration, Ehitajate tee 5, 12616 Tallinn, Estonia*

Abstract – To reduce emissions in the maritime transport sector, the International Maritime Organisation (IMO) follows a global clean shipping strategy. Among the different directives of IMO, currently especially the sulphur emission regulations pose challenges for the shipping industry. Related to this are the established Sulphur Emission Control Areas (SECAs) and the introduced global sulphur cap. To comply with the sulphur restrictions, according to the present technological state of the art, ship-owners have three options for their existing fleet: the installation of emission abatement technologies, the switch to low sulphur fuels, or retrofitting for the usage of alternative fuels. Regardless which option is favoured, most often selected solutions still depend on fossil fuels. The reasons for this can be traced back to the fact that supply of biofuels is not ensured in ports and generally seen as no profitable solution. This paper develops and examines an innovative business model with a special focus on liquefied biogas (LBG). The study bases on collected qualitative and quantitative data, which was used by applying the Business Model Canvas. The results will highlight that the business model bears the potential to promote LBG supply. Next to this, the research will show that blockchain and smart contracts are able to foster the implementation of the business model and optimisation of value chain operations. Lastly, economic advantages were highlighted within a case study that refers to the seaport Karlskrona in Sweden and the RoPax ferries from Stena Line that travel back and forth to Gdynia seaport in Poland.

Keywords – Business model innovation; digitalisation; emission reduction; global sulphur cap; LBG “Liquefied Biogas”; LBM “Liquefied Bio-Methane”; SECA “Sulphur Emission Control Area”; small and medium-sized seaports; smart contracts

1. INTRODUCTION

Seaports are the backbone of the transport network without the worldwide economy could not exist in its present form [1]. Concerning Europe, 74 % of goods imported and exported, and 37 % of domestic trade is handled by ports [2]. In 2017, about four billion tonnes of freight and 415 million passengers passed through the 1,200 European ports [3], [4]. Furthermore, approximately 3 million people are employed directly or indirectly in ports across the EU Member States [5].

* Corresponding author.
E-mail address: robert.philipp@hs-wismar.de