

APPENDIX

How EU Contracts for Difference can support zero-emission fuels

May 2022

Appendix A - Assumptions

Table A1: Variables and sources

Variable	Unit	Value	Source
HFO price	USD/t	450	Average annual price from July 2020 to July 2021 - shipandbunker.com
SZEF price	USD/tHFOe	1,300	ETC calculations assuming delivered cost of US\$3/kg of green hydrogen
Carbon price - low	USD/t	60	Harnessing the EU ETS to reduce international shipping emissions
Carbon price - high	USD/t	103	Harnessing the EU ETS to reduce international shipping emissions
Utilization factor for electrolyser capacity calculation	%	50	ETC Assumption
Efficiency for electrolyser capacity calculation	kWh/kg	53	Assessment of Hydrogen Production Costs from Electrolysis: United States and Europe
Electrolyser cost for CAPEX assumption	USD/kW	800	Mid-range assumption Green Hydrogen Cost Reduction
New vessel cost for CAPEX assumption	USDm per vessel	36	The Next Wave
Vessel size for Europe-South Africa bulk carrier route	DWT	200,000	Assumption
Annual fuel consumption for 200,000+ DWT bulk carrier	HFO	13,000	IMO GHG4
Foreign exchange rate	Euro to dollar	1.18	2021 average

Table A2: Trajectory of CfD program costs

	2026	2027	2028	2029	2030
HFO price including EU ETS (€/tonne)	530	560	600	625	660
SZEF CfD Strike Price Round 1 (€/tHFOe)¹	1,100	1,100	1,100	1,100	1,100
Total HFO saved each year from switch to SZE-Fs (millions of tonnes)	0.5	1.1	1.6	2.2	2.7
Cost of implementing a CfD (€ billions)	0.30	0.60	0.80	1.05	1.20

¹ The Energy Transitions Commission has assumed this SZEF price for the first round of the CfD program and represents a conservative estimate. The SZEF price is likely to decrease over subsequent rounds of the CfD program.

Appendix B – expected electrolyser capacity by 2030

Announced green hydrogen electrolyser capacity by 2030 and current bunkering locations on route, *electrolyser capacity (GW)*



Source: Ship & Bunker; Hydrogen Council estimates of hydrogen capacity ramp up