



# CARNIVAL AND WÄRTSILÄ PARTNERSHIP

As part of our plans to address our impact on climate change, in 2017 we enhanced our long-term partnership with Wärtsilä, one of our main engine manufacturers, by signing a long-term engine maintenance and energy efficiency agreement. Core to the partnership is a long-term plan to continuously improve our engine performance and efficiency. The agreement builds on our existing partnership and is aimed at maintaining our high levels of main engine safety and reliability. The agreement is performance-based and provides for shared financial incentives and exposure based on outcomes for both ourselves and Wärtsilä.

The comprehensive, 12-year strategic agreement, worth approximately \$1 billion in total, includes all engine maintenance and monitoring for 78 vessels within our fleet of 100+ vessels. The agreement is designed to reduce overall maintenance costs while at the same time improving engine efficiency through both real-time performance monitoring and technology investment. The agreement was developed through the close collaboration of teams from Carnival and Wärtsilä, who met regularly for more than one year leading up to the execution of the agreement in order to ensure that each component of the agreement adds value to both entities.

Under the agreement, Wärtsilä oversees and supports all engine maintenance and has near real-time access to performance data from each of the 402 engines. This transparency allows Wärtsilä to make informed technical decisions to optimize both regular maintenance internals and major engine overhaul activities.

Performance data from individual engines is analyzed by Wärtsilä's technical experts enabling, real-time optimization of the equipment and prediction of operational and maintenance demands. Similarly, engine performance data is compared across the fleet to identify optimal operational parameters and maintenance regimes. Data from each engine is transmitted ashore every 30 seconds, and full data visibility is provided to both parties for all recommendations and actions taken.

As part of the agreement, engine-level efficiency and fuel consumption are also measured, tracked and trended on a regular basis, providing improved transparency into engine performance that informs opportunities to make further improvements to engine operations. The data provided also allows for tailored optimization of the combustion process, which also improves the quality of our air emissions.

With over 400 engines monitored and maintained under the agreement, even the smallest improvements in vessel fuel consumption will add up to significant reductions in emissions and annual savings.



From left to right:

**Jakko Eskola**  
Current Wärtsilä  
President & CEO

**Arnold W. Donald**  
Carnival President  
& CEO

**William R. Burke**  
Carnival Chief  
Maritime Officer

**Björn Rosengren,**  
Former Wärtsilä  
President & CEO

**Micky Arison**  
Carnival Chairman  
of the Board



"WE EXPECT THIS PARTNERSHIP TO DELIVER SIGNIFICANT ADDITIONAL FUEL SAVINGS. THIS IS IMPORTANT BECAUSE OUR FUEL CONSUMPTION REPRESENTS APPROXIMATELY 97% OF OUR GREENHOUSE GAS EMISSIONS."

- William R. Burke - Chief Maritime Officer, Vice Admiral, U.S. Navy (retired)