



Ship Efficiency 2009

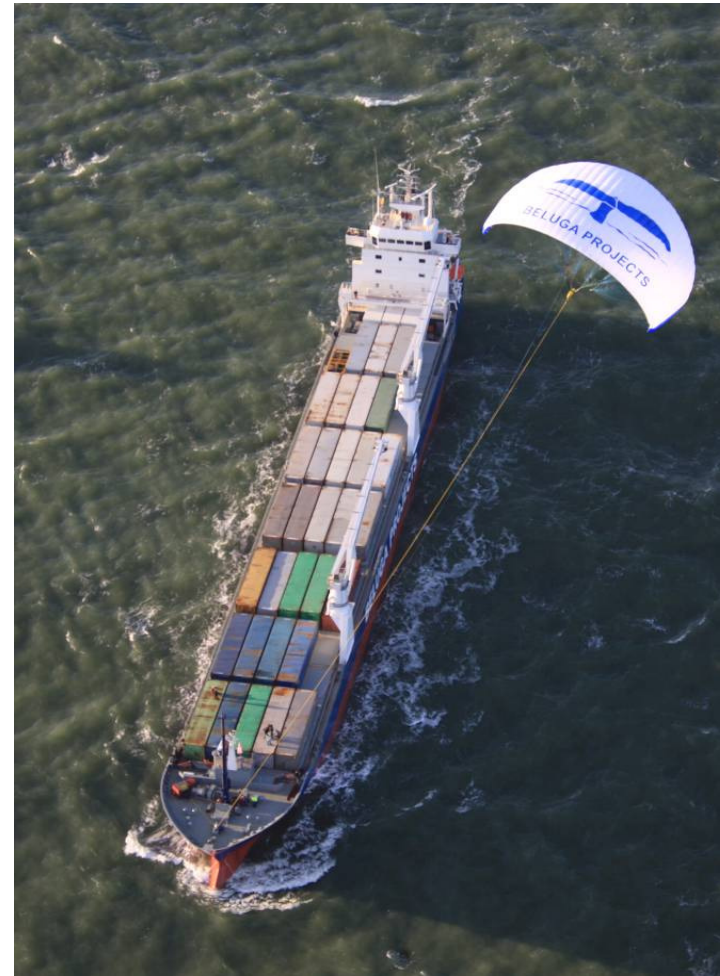
SkySails Status and Way Ahead

**Hamburg
29. September 2009**

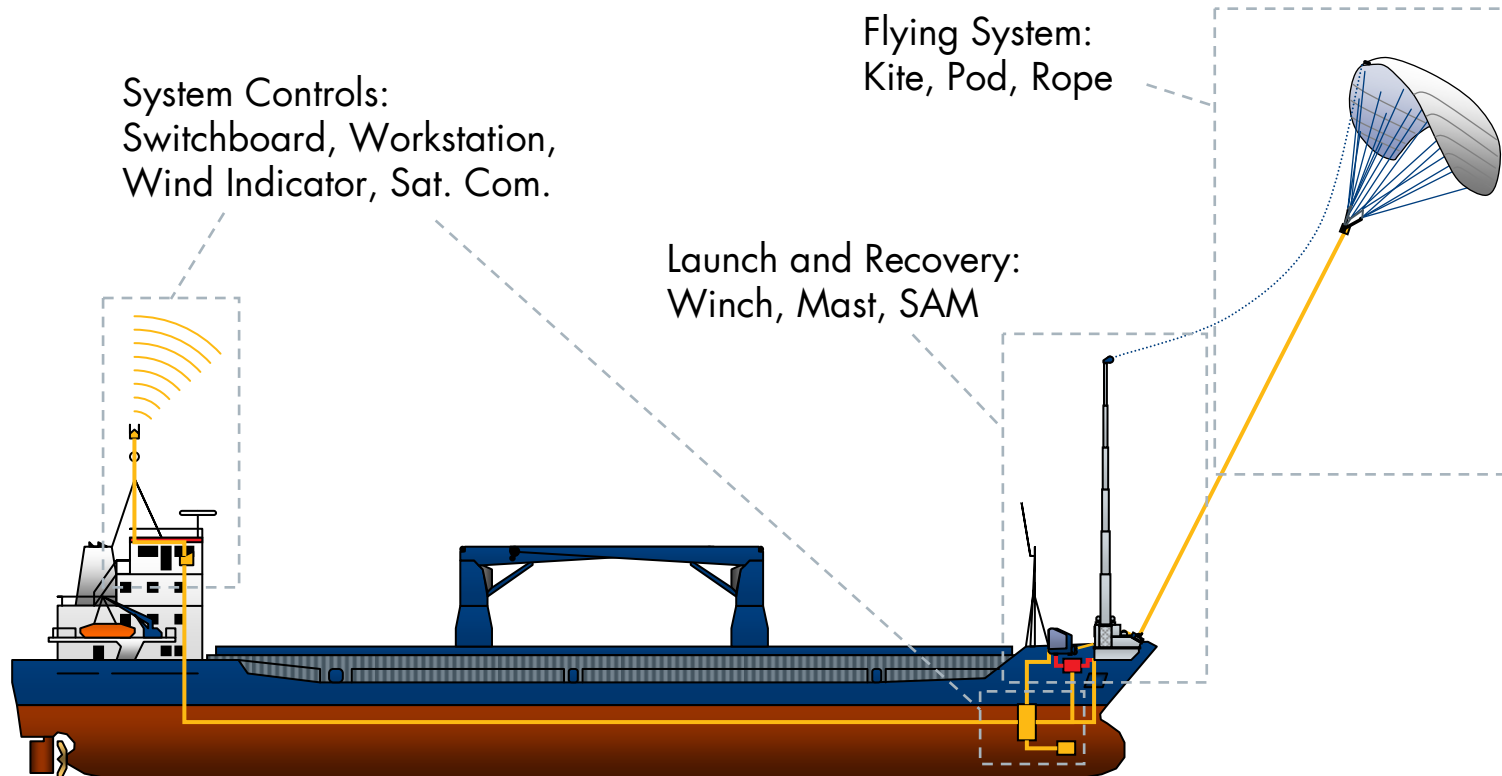


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- SkySails Technology
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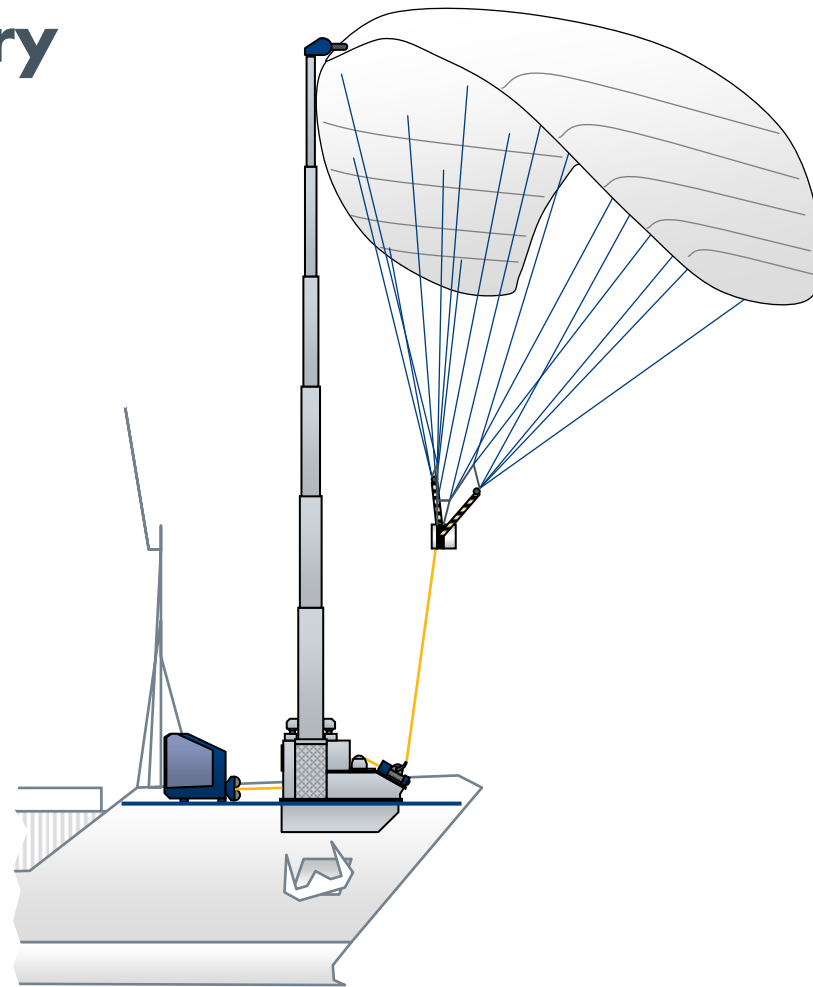


System Components



Launch and Recovery

- SkySails Winch: proven design for offshore platforms
- SkySails Arrangement Module: improved layout with highly variable telescopic mast
- SkySails kite and pod: improved for high durability



SAM II: Increased Variability



SAM II: Easy Installation



The Kite



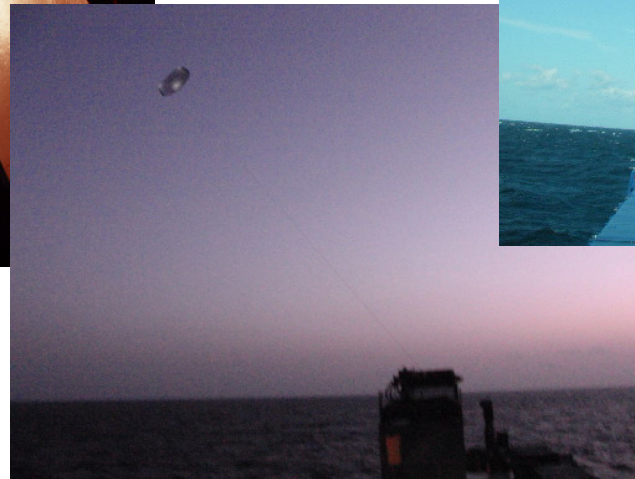
Ships in Operation

- MV "Michael A.": in regular operation
- MV "Beluga SkySails": upgrade to SKS C 320 in progress
- MV "Theseus": new improved SKS C 160 installation (SAM II), first vessel of a series of three newbuildings for "Wessels" to be equipped with SkySails

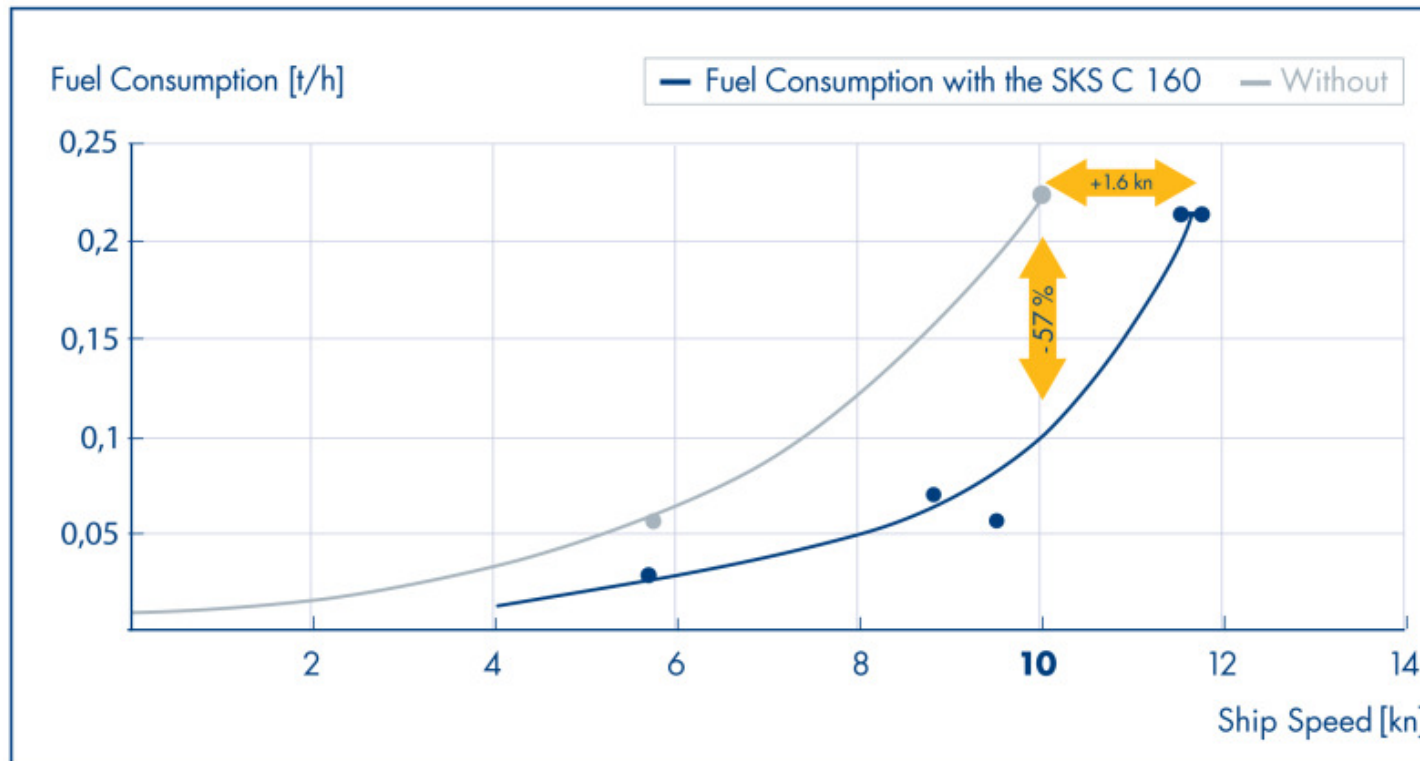
In operation since August 09



Daily Operation



Operational Results

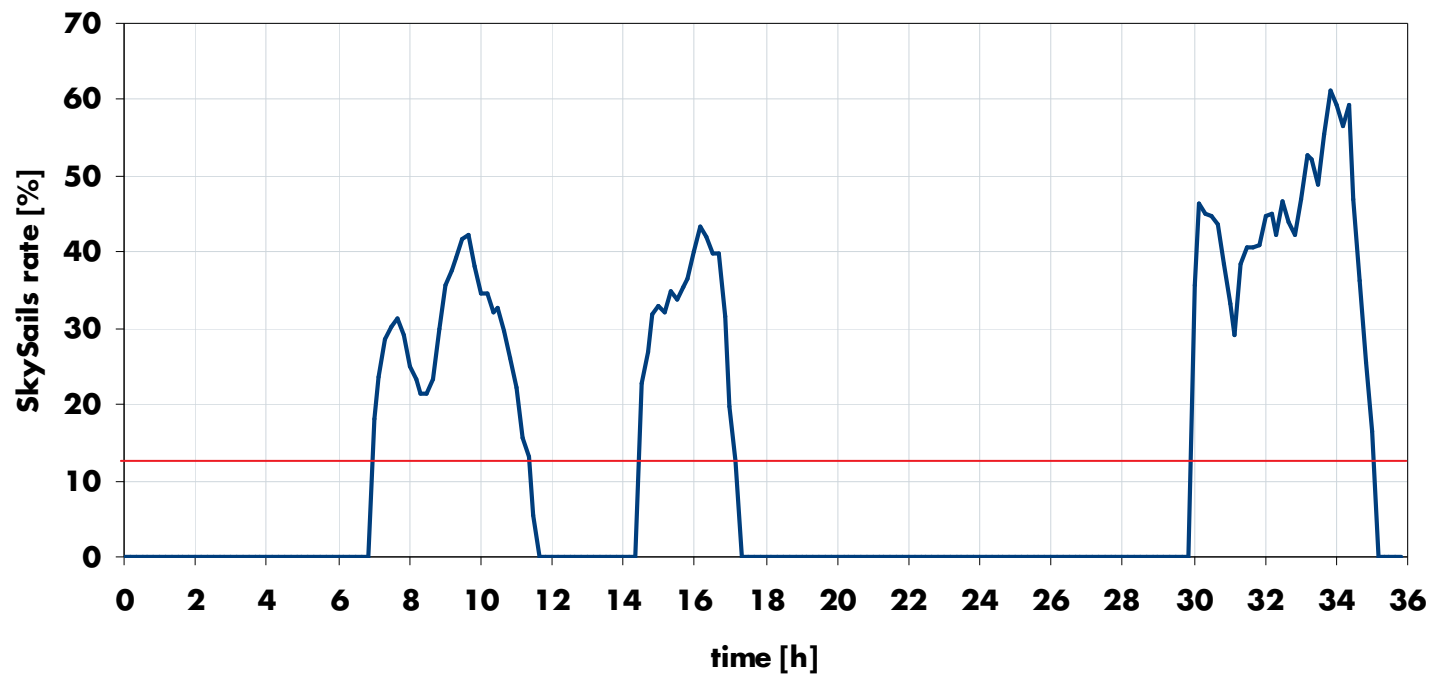


FUEL CONSUMPTION MV "MICHAEL A." (MGO)

Example: Results of Operations at 6 Bft



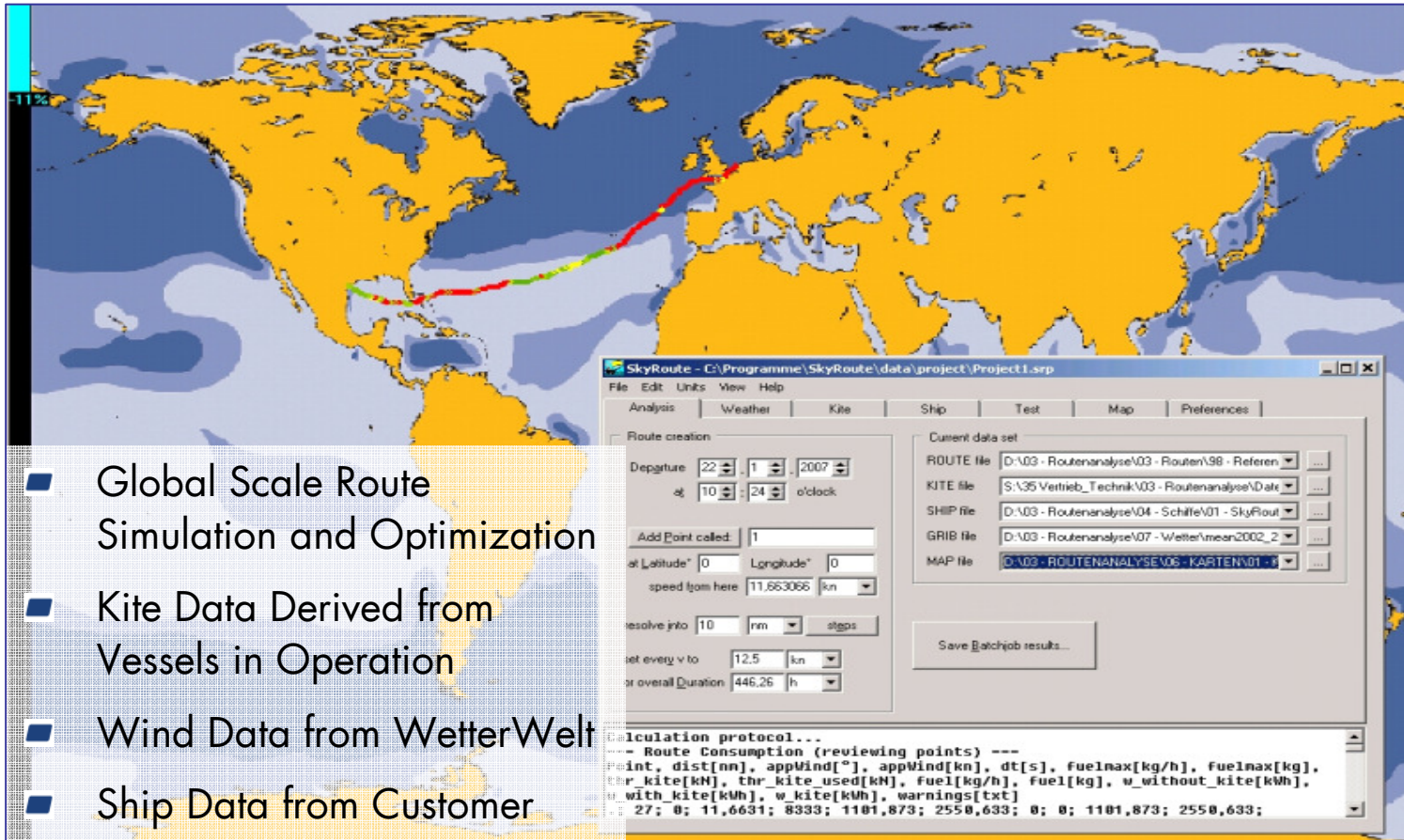
Operational Results



SkySails savings in % of the total fuel consumption



SkyRoute



The screenshot displays the SkyRoute software interface. The main window shows a world map with a route highlighted in red and green. A configuration window is open in the foreground, titled "SkyRoute - C:\Programme\SkyRoute\data\project\Project1.srp". The window has a menu bar (File, Edit, Links, View, Help) and several tabs (Analysis, Weather, Kite, Ship, Test, Map, Preferences). The "Analysis" tab is active, showing "Route creation" settings. The "Current data set" section contains dropdown menus for ROUTE file, KITE file, SHIP file, GRIB file, and MAP file. The "Route creation" section includes fields for "Departure" (22, 1, 2007), "at" (10, 24 o'clock), "Add Point called:" (1), "at Latitude" (0), "Longitude" (0), "speed from here" (11,663066 km), "resolve into" (10 nm steps), "set every v to" (12,5 km), and "for overall Duration" (446,26 h). A "Save Batchjob results..." button is visible. The bottom of the window shows a "Calculation protocol..." section with a table of route consumption data.

Point	dist[nm]	appWind[°]	appWind[kn]	dt[s]	fuelmax[kg/h]	Fuelmax[kg]	thr_kite[kWh]	thr_kite used[kWh]	Fuel[kg/h]	Fuel[kg]	w_without_kite[kWh]	w_with_kite[kWh]	w_kite[kWh]	warnings[txt]
27	0	11,6631	8333	1101,873	2550,633	0	0	1101,873	2550,633					

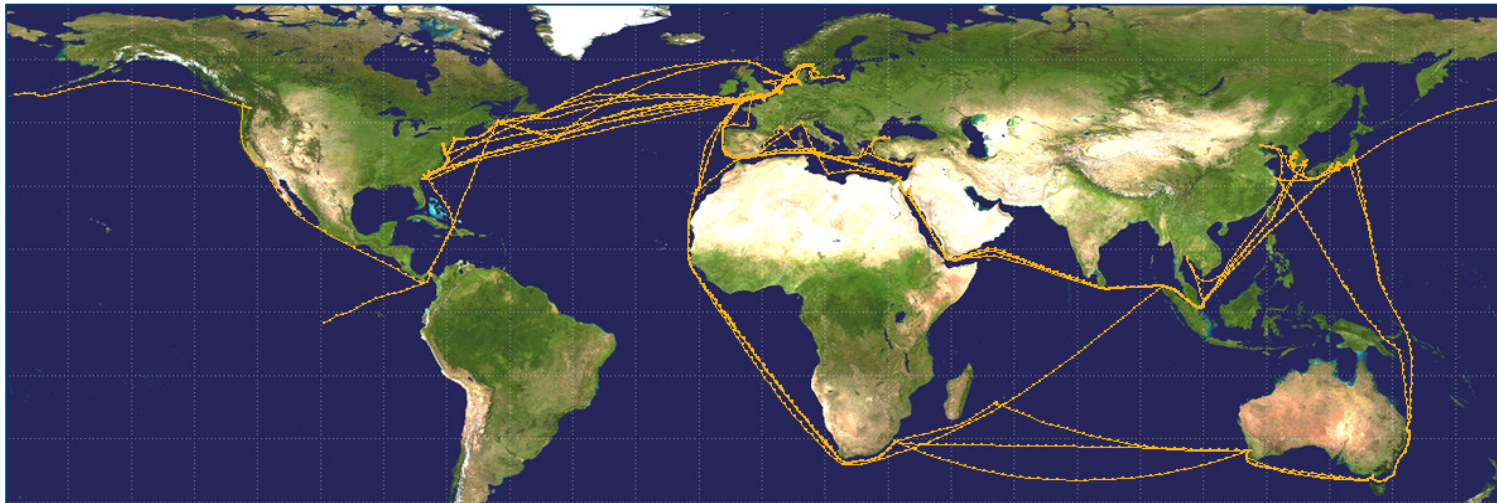
- Global Scale Route Simulation and Optimization
- Kite Data Derived from Vessels in Operation
- Wind Data from WetterWelt
- Ship Data from Customer



Route Simulation (FH OOW)



Logbook Analysis

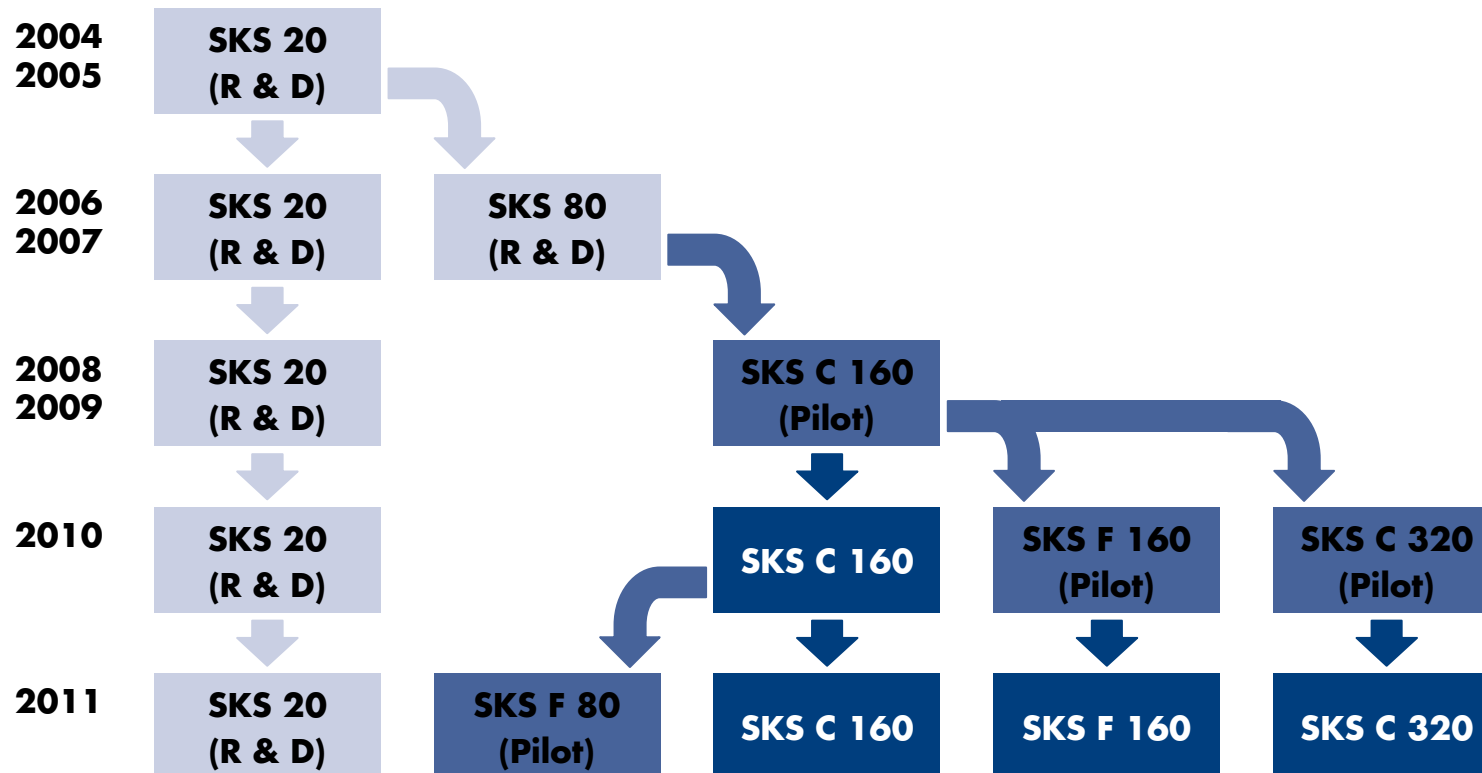


- Analysis based on Logbook Data
- Verification of Computational Models
- Detailed Reporting

Days at sea [d/a]	290.00
Energy total [MWh/a]	20,917.3
Energy SKS [MWh/a]	2,617.2
Savings [%]	12.5%
Fuel consumption [t/a]	4,392.6
Fuel costs [€/a]	1,856,046
Savings [€/a]	232,233



SkySails Product Development





Thank you very much for your attention!

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