



# WIND-POWERED AUXILIARY GENERATOR (WPAG)

Auxiliary generators make up for 5 - 10%\* of the total fuel costs of a merchant vessel. The cost for generating onboard electricity with a Diesel-powered generator is very expensive and ranges from 12 to 16 US-\$-Cent per kWh at current fuel prices.

Now with SkySails Power's WPAG ship owners can face this challenge by making use of the most powerful resource of renewable energy on the high seas again: Wind!

## -50% aux. fuel consumption

By using WPAG costs drop to about 7 US-\$-Cent per kWh for auxiliary power generation.

## Rapid pay back & flexible financing

WPAG pays back in less than 5 years when used in a good wind resource. Due to this attractive business case, SkySails can offer flexible financing such as leasing or power purchase agreements (PPA).

## Improved energy efficiency – less emissions

WPAG not only cuts costs - it also reduces emissions and improves a vessel's energy efficiency.

## Plug & Play - Fast & easy integration

WPAG is containerized and thus can easily be installed on deck. Easy integration into the ship's power grid via existing interfaces – as easy as an auxiliary diesel generator. Operation requires no special clearance on the high seas.

\*Baldi, Johnson, Gabriell, Andersson: "Energy and Exergy Analysis of Ship Energy Systems", Department of Shipping & Marine Technology, Chalmers University of Technology, Gothenburg/Sweden, 2015

Business Case WPAG 200kW**	wind resource	
	low	high
WPAG energy production [MWh/year]	500	900
Aux. fuel savings [t/year]	110	198
Aux. fuel savings [USD/year @600USD/MT]	66,000	118,800
Aux. lube oil & maintenance savings [USD/year]	2,178	3,920
<b>Aux. savings [USD/year]</b>	<b>68,178</b>	<b>122,720</b>
WPAG Opex [USD/year]	16,667	30,000
<b>Net savings [USD/year]</b>	<b>51,511</b>	<b>92,720</b>

\*\*Based on November 2018 fuel prices

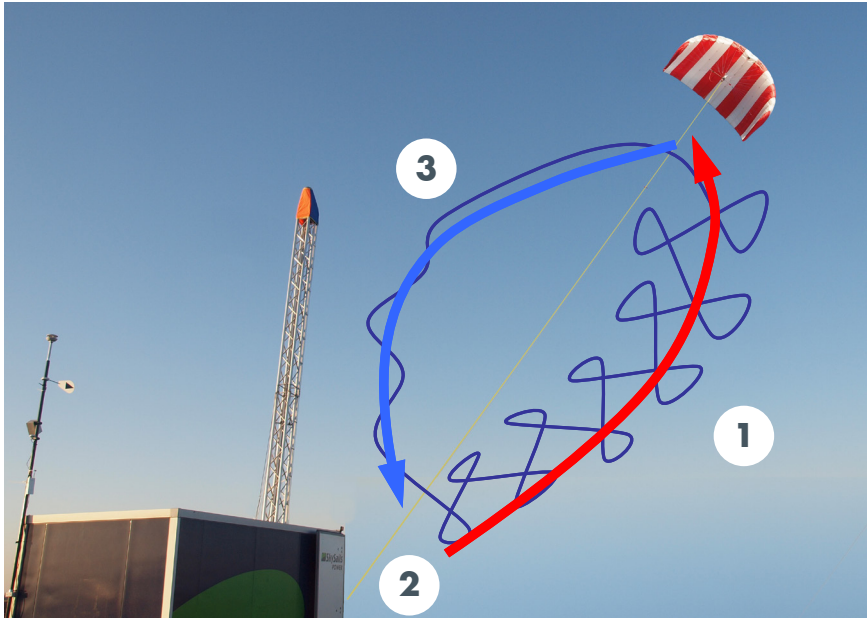
## Hybrid Power - Fit for the future

WPAG comes with a high capacity battery pack. Vessel grid stability is improved, peaks are filtered out.

## Stay flexible

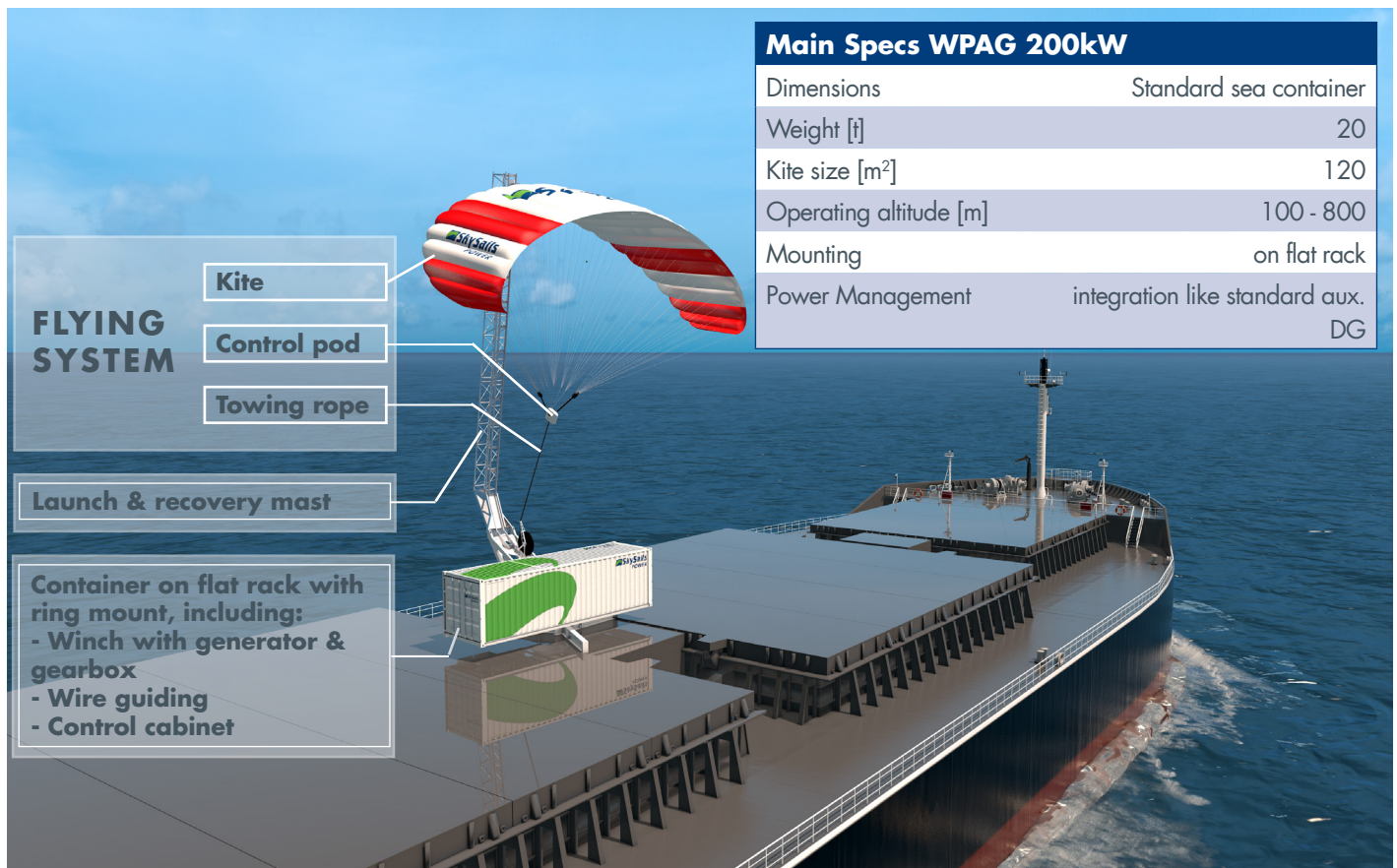
Different to fixed power solutions, WPAG as a containerized mobile solution can easily be transferred from ship to ship – just like a mobile diesel power generator, but cleaner & cheaper!

## HOW IT WORKS



- 1** In the **work phase** the kite pulls the rope from the drum of a winch
- 2** A generator inside the drum converts the rotatory power to electricity
- 3** In the **rewind phase** the autopilot steers the kite into a force neutral position – the generator now acts as a motor and reels back the rope, consuming only 4% of the energy generated in the work phase – the excess energy is fed into the grid and the power production cycle starts again

## WPAG 200kW



### Main Specs WPAG 200kW

Dimensions	Standard sea container
Weight [t]	20
Kite size [m <sup>2</sup> ]	120
Operating altitude [m]	100 - 800
Mounting	on flat rack
Power Management	integration like standard aux. DG

## GET IN TOUCH:

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