

Data sheet *Venyo (PN -14)*

System set-up

Flying system

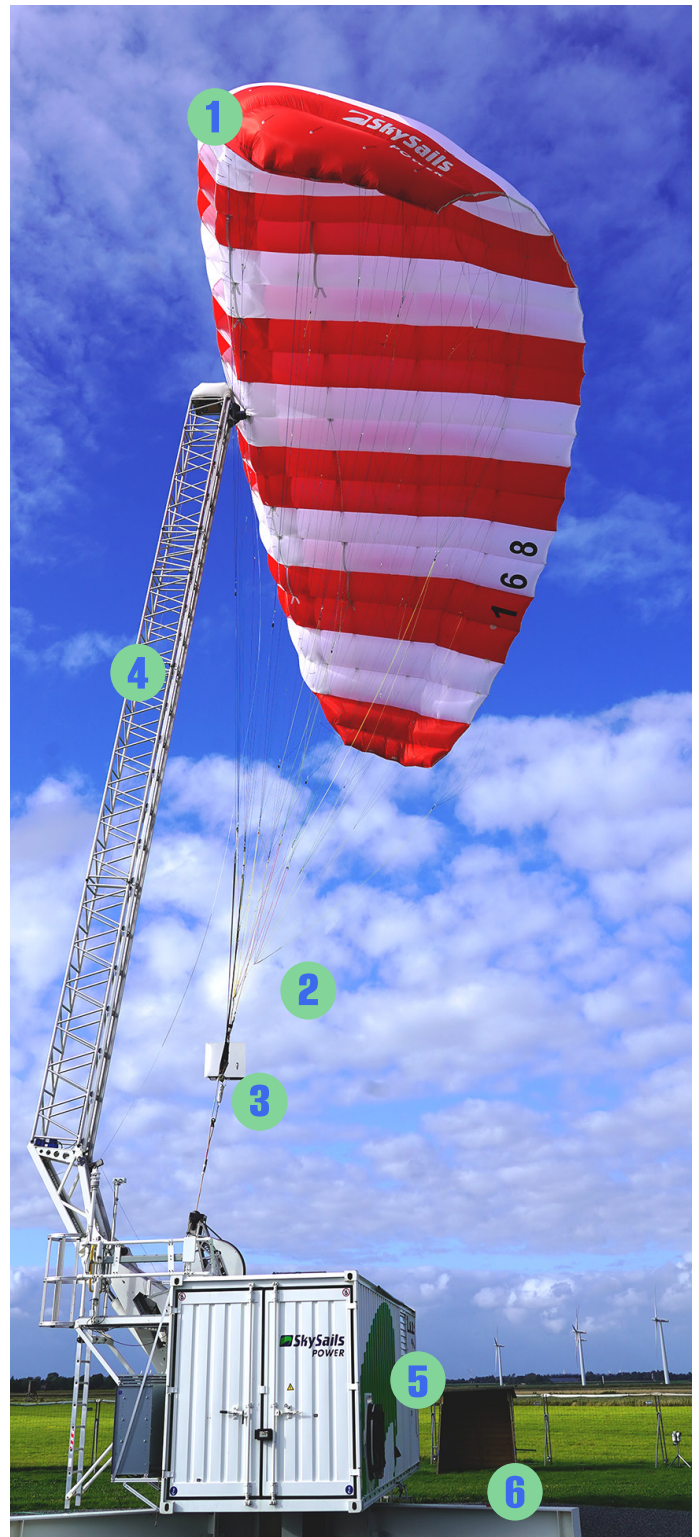
Kite	Canopy, bridle system, reefing system, kite adapter
Control pod	Frame and fairing, drive, power & telemetry electronics, sensors, control & redundant communication system, safety systems, ram air turbine, flash lights, battery
Tether	Fibre ropes with wire lay construction

Ground station

Drive train	Towing winch, profiled drum, gearbox, generator, brakes, power electronics and converter system
Launch & landing system	Mast, mast adapter, mast support and kinematics, reefing winch incl. wire guiding
Auxiliary systems	Ventilation & cooling system, wind sensors, power electronics auxiliary system, yaw system (bearing, drive, gear)
Control system	Control electronics, sensors, processing and communication systems, control software, licensed for auto pilot, flash lights
Operation panel	Operator monitoring system and remote control for system operations on site

Grid connection module

Inverter	Grid & consumer (auxiliary devices)
Energy storage system	Buffer battery



- 1 Kite
- 2 Control pod
- 3 Tether
- 4 Launch & landing system
- 5 Ground station:
 - Winch with generator & gearbox
 - Control cabinet
 - Container
- 6 Tripod with ring mount on concrete foundation plate



Data sheet Venyo (PN -14)

Design data¹

Rated cycle power ¹	up to 200 kW
Launch wind speed (ground altitude)	> 5 m/s
Rated wind speed (flight altitude 200 m)	13 m/s
Cut-out wind speed ¹ (flight altitude 200 m)	25 m/s
Operating temperature ²	0 - 40 °C

Flying system¹

Flexible kite size	120 - 180 m ²
Kite type	Ram air kite
Kite material	High performance textiles
Kite weight	35 - 52 kg (depending on kite size)
Control pod weight	~ 55 kg
Tether diameter	14 mm
Tether length ³	600 - 800 m
Total operation radius	750 - 950 m
Tether weight	245 g/m

Ground station

Generator/installed power	380 kW
Generator type	Asynchronous
Power generation	Automated pumping cycle
Yaw angle	+/- 180°
Rotational speed	120°/min
Dimensions	2.6 x 9.1 x 2.4 m
Weight	28 t

Launch & landing system

Mast type	Aluminium lattice mast
Mast height	19 m
Mast height above ground	24 m

Grid connection module¹

Max rated power output	200 kW
Grid inverter output	400 V AC
Frequency	50 Hz / 60 Hz
Energy storage	Capacity ~ 210 kWh
Features	<ul style="list-style-type: none">- Constant power output- Smart energy management- Fault ride through
Internal DC circuit	700 - 800 V DC
Dimensions	2.9 x 2.4 x 6.1 m
Weight	10 t

Operations²

Duration work phase of power cycle	60 - 300 s
Duration rewind phase of power cycle	30 - 60 s
Flight mode	Automated
Launch & landing	Automated

Logistic

Transport	Standard shipping format
Ground station	30ft Standard container
Grid connection module	20ft High cube container

¹Depending on site specific system configuration, ²From 35°C, the system goes into derating, ³ Shorter tether results in less AEP

Annual energy production (aep) for Venyo (PN-14)



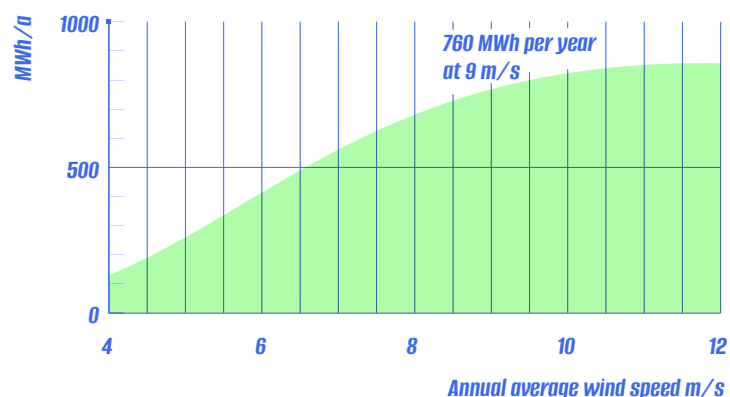
Rated cycle power
up to 200 kW



Kite size (max.)
180 m²



Annual energy yield
760 MWh/a



Single system, Standard Rayleigh wind distribution ($k=2$), Wind speed at flight altitude (200 m), Kite size: 170 m², Tether length: 800 m, Air density = 1.2 kg/m³, 100 % Availability, 0 % Losses.