

Changsha Linyi Yunchuan Energy Technology Co., Ltd. – Stratospheric Floating Wind Power System (SAWES)

Peter Lobner, updated 30 September 2025

1. Introduction

In October 2024, several Chinese news sources reported that the Beijing firm Changsha Linyi Yunchuan Energy Technology Co., Ltd. (also known as Beijing Linyi Yunchuan Energy Technology Co., Ltd. and SAWES Energy Technology Co., Ltd.), in collaboration with Tsinghua University, the Institute of Aeronautics and Astronautics of the Chinese Academy of Sciences and other scientific research institutions, had developed and flown a tethered buoyant airborne turbine (BAT), known in China as the S500 "Stratospheric Floating Wind Power System" (SAWES), and generated 50 kW of electric power.

A BAT, or SAWES, is a tethered aerostat (a kite balloon) that can lift a lightweight turbo-generator into the stronger high altitude winds and deliver electric power via its tether to a ground station and then on to an electrical substation for a local micro-grid, or to the grid itself.

Three months after the S500 flew, the same team flew a similar but longer version, identified as the S1000, and reported generating more than 100 kW of electric power. In September 2025, the team flew the much larger and more complex S1500 with a rated generating capacity of 1.2 MW.



*(L) Tethered S500 SAWES aerostat, Oct 2024, (R) S1500 aerostat, Sep 2025.
Sources: (L) China Daily, (R) from Beijing SAWES Energy Tech handout.*

Prevailing winds are stronger at higher altitudes and the energy in the wind is proportional to the cube of the wind speed. This means that there is significantly more energy available for harvesting at higher altitudes than at ground level. This is the rationale for the trend toward taller, larger diameter stationary wind turbines that can harvest energy from winds at altitudes up to about 300 m (984 ft).

An advantage of a BAT, or SAWES, is that the airborne wind turbine can harvest energy from the wind at even higher altitudes without the massive hardware associated with fixed wind turbines sited on land or offshore. In China, data shows that, among the nine major wind farms planned in the Xinjiang region in northwestern China, the average wind power density exceeds 150 watts per square meter over a broad geographic area.

Functionally, the Chinese SAWES is similar to the Altaeros Energies BAT, prototype versions of which were test flown in the U.S. from 2010 to 2015, but not developed into a commercially deployable system. When it flew in October 2024, the S500 SAWES became the most powerful buoyant airborne turbine to fly. Less than one year later, the S1500 SAWES set another significant milestone in September 2025 as the first megawatt-scale buoyant airborne wind turbine to fly.



Altaeros BAT operational testing. Source: Altaeros (circa 2012)

2. S500 SAWES

The Chinese domestically-produced, helium-filled S500 SAWES is 23 meters (75.5 ft) long and 15 meters (49.2 ft) in diameter. A two-bladed wind turbine with 2.4 m (7.9 ft) blades is installed in a 5 m (16.4 ft) diameter duct along the longitudinal axis of the S500. At wind speeds greater than 7 m/s (15.6 mph), the wind turbine drives a lightweight generator with a rated capacity of more than 50 kW .



*S500 SAWES and its base station (right) in a hangar with an AVIC AS700 blimp.
Source: Screenshot from New China TV video (17 November 2024)*

On 11 October 2024, a flight test was conducted with the S500 ascending for 10 minutes to its operating altitude of 500 meters (1,640 ft) above ground in Wuhan, in central China's Hubei Province. During this test, the S500 demonstrated that it could generate more than 50 kW of power.



*Tethered S500 SAWES at its operating altitude above Wuhan, China.
Source: China Daily (photo taken 10 Oct 2024)*



*S500 in flight. Source: Screenshot from New China TV video
(17 November 2024)*



Details of the S500 ring tail configuration. Source: (L) China Daily (10 Oct 2024), (R) Screenshot from New China TV video (17 November 2024)

The S500 was displayed in November 2024 at an energy conference in Hami, which is in the Xinjiang region in northwestern China.



S500 SAWES docked on its base station for display in Hami. Source: Shiliu Yun/Photo by Xinjiang Daily reporter Wei Yonggui (27 October 2024)

3. S1000 SAWES

In January 2025, Changsha Linyi Yunchuan Energy Technology Co. Ltd. demonstrated its larger S1000 SAWES flying at an altitude of 1,000 meters (3,281 ft) above the Poyang Lake Model Test and Research Base in Gongqing City in Jiangxi Province, in eastern China. Science & Technology Daily reported,

“The S1000 floating wind power generation system with a diameter of 15 meters (49.2 ft) and a total length of about 30 meters (98.4 ft) slowly took off. After climbing for about 15 minutes, it successfully reached the test height and hovered stably.”..... “During the test flight, the generated power exceeded 100 kilowatts.”

In comparison to the S500, the S1000 has the same 15 meter (49.2 ft) maximum diameter, is 7 meters (23 ft) longer, operates at a higher altitude, and has a larger, reconfigured ring tail.



S1000 on the ground, docked on its base station. Note the revised ring tail configuration. Source: Screenshot from YouTube video



S1000 deploying from its base station. Source: Science and Technology Daily via China Energy News (13 January 2025)



S1000 in flight above its base station. Source: Screenshot from YouTube video



*S1000 at altitude, flying above its test site.
Source: Screenshot from YouTube video*



S1000 on display. Source: Screenshot from YouTube video

4. S1500 SAWES

Less than one year after the S500's first flight, Changsha Linyi Yunchuan Energy Technology Co. Ltd. flew the substantially larger, redesigned S1500, which resembles a large blimp surrounded at its stern by an inflated ring-shaped duct structure that houses 12 micro turbine-generator sets and also supports four inflated tail fins. The *South China Morning Post* reported:

“Between September 19 and 21 (2025), the airship-like S1500 – about the size of a basketball court and as tall as a 13-storey building – became the first turbine of its kind to generate one megawatt of power during a test flight at a desert site in China's western Xinjiang region.”



*S1500 moored at its base station.
Source: Screenshot from YouTube video, Sep 2025*

General characteristics of Changsha Linyi Yunchuan Energy Technology Co., Ltd. tethered wind turbine aerostats

Parameter	S500	S1000	S1500
Length	23 m (75.5 ft)	30 m (98.4 ft)	60 m (196.9 ft)
Width	15 m (49.2 ft)	15 m (49.2 ft)	40 m (131.2 ft)
Height	15 m (49.2 ft)	15 m (49.2 ft)	40 m (131.2 ft)
Operating altitude	500 m (1,640 ft)	1,000 m (3,281 ft)	1,500 m (4,921 ft)
# of wind turbine-generators	1 in a central duct, rated @ 50 kW	1 in a central duct, rated @ 100 kW	12 integrated in an annular duct, each rated @ 100 kW
Generating capacity, total	50 kW	100 kW	1.2 MW



Stern view of S1500 floating inside its hangar. Note the segmented flow paths inside the annular duct, each containing a single two-bladed wind turbine.

Source: Composite photo from YouTube video, Sep 2025



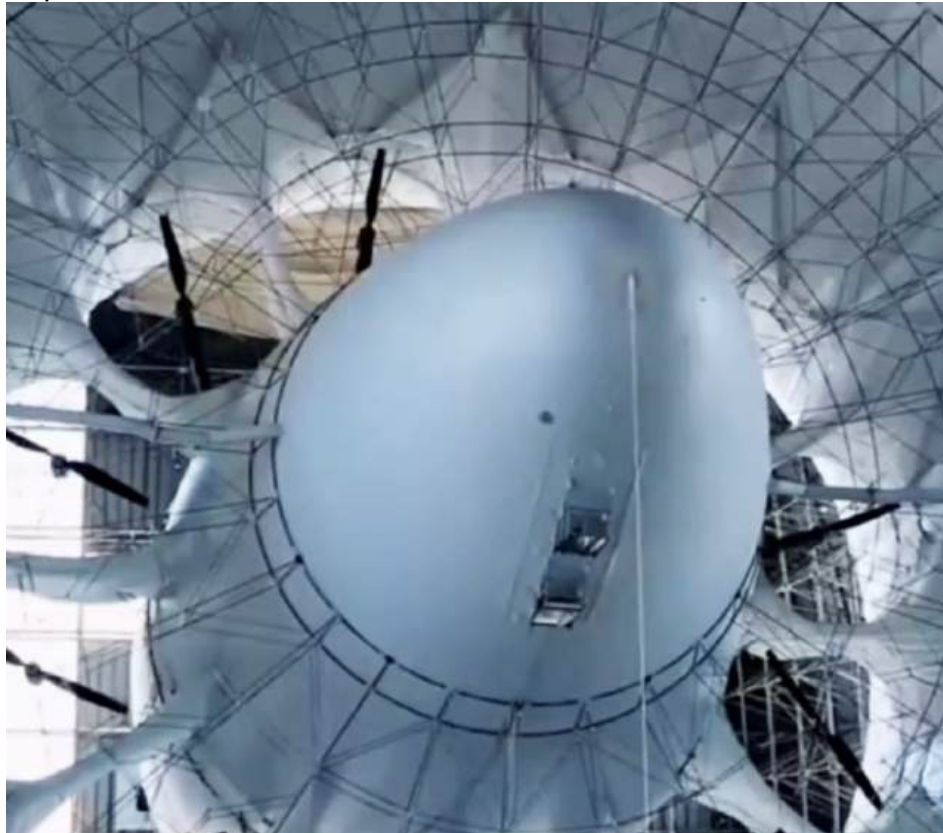
S1500 bow-on view showing the geometry of the central hull and the inflated annular ring structure housing twelve 100 kW micro-turbines, each driven by a two-bladed carbon fiber turbine. Source: BRTV (China) via screenshot from YouTube video, Sep 2025



S1500 view from under the main hull looking aft toward the inflated annular duct structure. Source: Screenshot from YouTube video, Sep 2025



Stern view of the S1500 moored outdoors, showing all twelve 2-bladed air turbines positioned inside the annular duct. Source: South China Morning Post



Stern view showing the lightweight lattice structure that establishes the geometry of the annular duct and supports the turbo-generators. Source: Screenshot from YouTube video, Sep 2025



*Closeup view of S1500 moored to its base station.
Source: Beijing SAWES Energy Tech handout*



*S1500 flying above its base station during night operations.
Source: Screenshot from YouTube video, Sep 2025*

The S1500 operates at an altitude of around 1,500 meters (4,921 ft) above ground level, which is a substantially higher altitude than its predecessors.



*Rendering of an S1500 in flight.
Source: People's Daily, China; reportedly AI-edited*

5. Potential applications

A SAWES can be an important resource for emergency responders following a natural disaster. For example, following an earthquake or flood, it can be quickly launched to temporarily restore some on-site electric power and communications and aid responders in surveying the affected area. Other potential applications include supplying power to micro-grids serving remote communities and islands, providing urban security surveillance, and supplying power and communications at remote industrial, mining and other resource development sites.



*Application of a SAWES in an urban emergency and disaster relief scenario.
Source: Changsha Linyi Yunchuan Energy Technology Co., Ltd.*

6. For more information

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<https://amulinfo.com/en/china-to-launch-the-worlds-first-megawatt-class-airborne-wind-turbine>
- Ling Xin, “World’s most powerful flying wind turbine launched in western China,” South China Morning Post, 26 September 2025:
<https://www.scmp.com/print/news/china/science/article/3326920/worlds-most-powerful-flying-wind-turbine-launched-western-china>

Videos

- “China's self-developed buoyant airborne turbine on display at airshow,” (0:13 min), posted by New China TV, 17 November 2024: <https://www.youtube.com/watch?v=bewzmZLeeNc>
- “The S500 Buoyant Airborne Turbine,” (2:45 min), posted by Bob and Shumin, 16 October 2024:
<https://www.youtube.com/watch?v=mwiocDuxiA4&t=101s>
- “China’s S1500 Airborne Wind Turbine,” (3:11 min), posted by Bob and Shumin, 24 September 2025:
<https://www.youtube.com/watch?v=HFfzcPBGGEQ>

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- *Modern Airships - Part 1*: <https://lynceans.org/all-posts/modern-airships-part-1/>
- *Modern Airships - Part 2*: <https://lynceans.org/all-posts/modern-airships-part-2/>
 - Altaeros Energies – Buoyant Airborne Turbine (BAT)
- *Modern Airships - Part 3*: <https://lynceans.org/all-posts/modern-airships-part-3/>