



# AWEC Milan

22-24 June 2022

## Summary of the Airborne Wind Energy's flagship event

The 9<sup>th</sup> edition of the Airborne Wind Energy Conference (AWEC) was held at the Politecnico di Milano from the 22<sup>nd</sup> to the 24<sup>th</sup> of June 2022. The conference was initially planned for 2021 but had to be postponed due to the Corona virus pandemic.

**Over 170 key actors from over 20 countries** gathered to debate challenges and opportunities in the pursuit of the launch of further airborne technologies. Attendees included scientists and engineers, professors and students, entrepreneurs and investors who convened to share their experiences, findings, opportunities and visions for airborne wind energy (AWE).

In total there were **six plenary keynote talks by prominent speakers** working in the field of renewable energy and airborne wind energy, spanning policy and strategic visions, industrial and business developments, and academic research:

- Stephan Barth, Chair of the International Energy Agency's Wind Technology Collaboration Program (IEA Wind TCP);
- Paula Nardone, Associate Professional at the International Renewable Energy Agency (IRENA);
- Stephan Wrage, CEO and Managing Partner at Skysails Power;
- Christopher Vermillion, Associate Professor at North Carolina State University at Charlotte
- Mike Blanch, Operations Director at BVG Associates
- Philip Bechtel, Lecturer at the Physics Institute of the University of Bonn.

The **conference programme** featured:

- 63 oral presentations in 12 sessions arranged in three parallel tracks
- 2 panel discussions with 5 OEM presentations covering all aspects of airborne wind energy
- 2 poster sessions, preceded by some 40 plenary spotlight presentations.

**Topics** covered by the presenters included:

- Business Development;
- Company Developments;
- Resource, siting and acceptance;
- Techno-economic studies
- Modelling and Control;
- Aerodynamics and Structure;
- Performance and optimization;
- Prototyping and operation and System Design.

A book grouping the abstracts of all content shared at the conference can be viewed [here](#). The presentations themselves will be made available shortly.



The following lists a number of **key learnings from the AWEC**:

- **The bankruptcy of Ampyx Power was discussed mainly informally.** Many players were disappointed by this recent event, especially because Ampyx Power had been one of the most advanced and best funded technology developers. However, overall spirit in the AWE community was nonetheless high since the case is regarded very specific: Firstly, the internal governance structure at Ampyx has been complicated for a while, and secondly, the approach to design a complex, large and expensive system without getting many operational hours can be regarded as one of the main reasons for the failure. This may be one of the key learnings for other companies, especially the ones using fixed-wing aircraft.
- **The next 2-3 years are crucial for the sector.** While several new companies are joining, the sector has lost a number of knowledgeable people and company expertise with Makani, Ampyx, KPS and a few others. It is thus important to get as many AWE systems flying as many hours as possible in the months and years to come to gain trust of policy makers, potential clients and investors.
- **The different AWE concepts can be seen as positive.** While there are many system architectures being developed (soft kites, fixed-wing as ground-gen and fly-gen, semi-rigid, rotary systems, etc.), as pointed out by Stephan Barth from IEA Wind TCP, it is appropriate to work on different designs since different markets and applications are targeted and more experience on performance is needed.
- **There is a convergence of the sector in various aspects:**
  - Almost all AWE Technology Developers are now focusing on **developing commercial systems in the range of maximum 100-200 kW** as Minimum Viable Product (some even lower). Larger systems are only targeted once sufficient operational experience is gained. Skysails has its systems already available on the market and Kitepower seems to follow suite.
  - The **collaboration of AWE Technology Developers has largely improved** over the last years through the set various Working Groups, the IEA Wind Task 48, sector meetings, etc. While there is naturally competition among the developers, the idea of working together on e.g. ground station, tether, test sites, standardisation, etc. is showing progress.
  - **The search for joint, open-access test sites in Europe has been put high on the agenda.** On these sites 24/7 operation should be ensured, also allowing power exports to the grid to generate revenues. A few years ago, this idea was discussed but was not seen as a priority. Now the time has come where all companies do need “undisturbed” testing environment and are even willing to share sites and thus learn from each other.
  - **The AWE White Paper has been commissioned with the aim to gain attention by policy makers and potential clients.** BVG associates calculates AWE capacity by the end of 2050 to be 177 GW. The extra cumulative cost to get AWE to the break-even point compared with the cost of established wind technology at around 2036 were shown to be about €4 billion, when just over 10 GW of AWE will have been installed. The panel discussion showed that sector is confident that the technology will be able to deliver on its promises, but it does need public and private support to do so.

Many delegates were greatly enthused to attend an in-person event again and feedback was very positive on the programme and the side events. Jon Gjerde, cofounder of Kitemill and Chair of the Board of [Airborne Wind Europe](#) concluded:

*"The conference covered a wide-ranging exploration of topics with a tight focus on innovation. It was pleasing to see such a collaborative spirit among the delegates. The action-oriented sessions were both innovatively produced and highly engaging, allowing for dynamic sharing and debating within a really insightful group of leaders."*