



Top-down view of 30 kW Kitemill airplane (17 August 2016)





Lode Carnel

CTO
Kitemill AS

Lista Fly og Næringspark
Bygg 104
4560 Vanse
Norway

lc@kitemill.no
www.kitemill.com

From Prototype Engineering towards Commercialization

Lode Carnel

Kitemill AS

When the main functional challenges for airborne wind energy are solved, this breakthrough energy source will face introduction problems as it is not a proven technology. Therefore, it is important that working prototypes try to collect a lot of operational hours in relevant environments as early as possible. Kitemill has developed prototypes as well as obtained the needed regulatory agreements for outdoors testing. The presentation describes the history of Kitemill until now and our strategy going forward. The developed prototypes are presented as well as our current technical status.

Kitemill has over time had a continuous dialogue with the civil aviation authorities resulting in two zones where kite turbines can operate, one permanent and one temporary one.

Early on, Kitemill identified rigid wings as the most promising concept to extract airborne wind energy. The initial focus of Kitemill was on demonstrating functionality of our small-scale setup (5 kW). After manual demonstrations, an autopilot was developed using commercial-off-the-shelf components. Later, the rigid wing was com-

bined with a quadcopter technology towards a fully functional 5 kW system including VTOL. The main technical challenge is currently the autopilot during high acceleration phases. Following the testing of this prototype, we designed, developed and constructed a 30 kW system. The project started in the beginning of 2015 and the plane was flown for the first time during the second half of 2016. Currently we have developed the VTOL system for the 30 kW plane and initial take-offs were performed. During summer 2017, it is anticipated to fly the 30 kW system in production as well.

The technical results of Kitemill led to a sale of a 30 kW demo plant at Lista, Norway. Initial weather analysis was done based on weather data from the last 25 years and this with our technical data lead to the business case. The demo will be part of an airborne wind energy center where also other companies are invited to participate. The demo plant will then be commercialised where Kitemill will follow DNV standards for technology qualification. Additionally, during this extensive testing phase Kitemill will accelerate the development towards the necessary robustness level on all the disciplines.