



# The Big AWE Picture

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AWE is easy - All that is needed for an Airborne Wind Energy Converter are four functional components: The components

<b>LIFT</b> ...to stay airborne	<b>ENERGY TRANSFER</b> ...to bring the energy to the ground
<b>BLADE</b> ...as the wind to mechanical energy converter	<b>GENERATOR</b> ...for the mechanical to electrical energy conversion

can be varied in order (GENERATOR before or after the ENERGY TRANSFER) and combined (e.g. a BLADE that produces lift and mechanical energy). For each of the functional components there are many proven solutions available:

So why do we – after generations of bright people have in-

<b>LIFT</b> Aerodynamic lift, buoyancy,...	<b>ENERGY TRANSFER</b> Drag/traction, electric current,...
<b>BLADE</b> Rotor, Wing,...	<b>GENERATOR</b> Rotary generator, linear generator,...

vested time and money – still not see a competitive solution to tower based wind energy that leverages the stronger, more consistent wind in higher altitudes? It took 3000 years for today's predominant three bladed horizontal axis tower based

wind turbines to evolve from the first wind energy converters in Persia. On the way hundreds of designs have been tested - thousands have been proposed. We should shorten the process for AWE.

The first part of the proposed talk aims to presents a complete overview of all theoretically possible ways to do AWE – Based on an analysis of airborne wind energy patents and publications and a clustering of the included four functional components.

The second part focuses on proposing selection criteria aimed to filter out the most promising approaches that can be expected to be technically and economically feasible. These criteria include:

- Weight efficiency
- Energy efficiency
- Airspace efficiency
- Cost efficiency
- Inherent stability/reliability/safety
- Maximum expected operational height
- Output variability
- Availability of base technology

This might lead to the identification of designs that are currently not tested in the scientific and industrial community.