



## TECHNOLOGY SOLUTION

### Sensors



# Wind Event Warning System

High-energy Doppler LIDAR to protect wind turbines and aircraft from severe wind events

NASA Langley Research Center has developed a wind event warning technology providing a practical early warning system (5-10 minutes) for a severe change in the wind vector. Events such as gusts, shear, microbursts or thunderstorm outflows can be detected in time to prevent damage to wind turbines or help airports prevent damage to aircraft. Further, an alternative power source could be ramped up or down as needed to accommodate the power draw in the electrical grid.

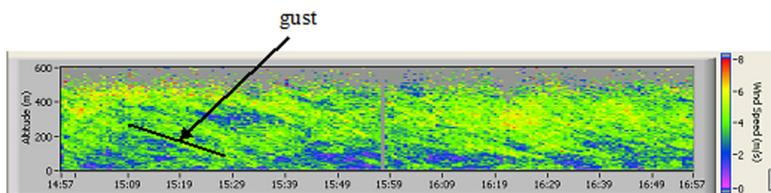
#### BENEFITS

- Provides sufficient warning time for action to protect wind turbines
- Allows time to ramp up or down an alternative power source
- Has the capability for long-range wind measurements in clear air, critical for airports



## THE TECHNOLOGY

The Wind Event Warning System (WEWS) is high-energy Doppler LIDAR sensor that measures approaching changes of wind such as an oncoming variation of wind speed that will change the power output of a wind farm. Different from low-energy, the high-energy Doppler LIDAR has the energy to reach the long distances necessary to provide adequate warning time of a wind event. With the time provided by WEWS, the blades of a wind turbine could be feathered to prevent strong wind from damaging the turbine. In addition, airports could use WEWS to protect aircraft from sudden wind hazards.



Gust detection of more than 10-minute warning time is shown here from a prototype high-energy lidar. A mild gust of 5-m/s speed is imbedded in background wind of 2-m/s. A severe wind event would produce an even more pronounced signal. Image Credit: NASA/ Grady Koch

## APPLICATIONS

The technology has several potential applications:

- Off-shore Wind Energy Applications
- Airport long-range wind event monitoring and detection

## PUBLICATIONS

Patent No: 10,067,235

## More Information

National Aeronautics and Space Administration

**Agency Licensing Concierge**

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