

Distributed Wind Competitiveness Improvement Project



The Competitiveness Improvement Project (CIP) is a periodic solicitation through the U.S. Department of Energy (DOE) and its National Renewable Energy Laboratory (NREL). Manufacturers of small and medium wind turbines are awarded cost-shared subcontracts via a competitive process to optimize their designs, develop advanced manufacturing processes, and perform turbine testing. The goals of the CIP are to make wind energy cost competitive with other distributed generation technology and increase the number of wind turbine designs certified to national testing standards. *Photo from Northern Power Systems, NREL 36193*

Increased Energy Production

CIP *system optimization* awardee Bergey Windpower of Norman, Oklahoma, achieved a 110% energy production increase for the Excel 15 turbine over the Excel 10 turbine by increasing blade length and improving blade aerodynamics and system controls.

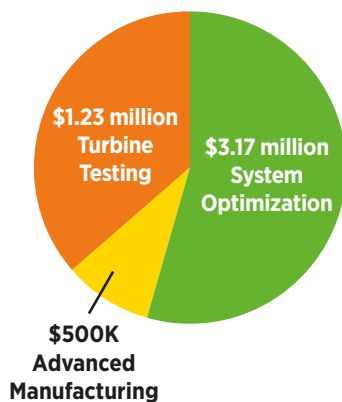
Reduced Hardware Costs

CIP *advanced manufacturing* awardee Pika Energy of Westbrook, Maine, reduced blade costs by approximately 90% by developing an innovative tooling and cooling strategy to produce blades using injection-molded plastic.

Certified Turbine Performance & Safety

CIP *turbine testing* awardee Primus Windpower of Lakewood, Colorado, achieved turbine certification—third-party verified testing for safety, function, performance, and durability—to national standards. Three CIP awardees are currently conducting certification testing.

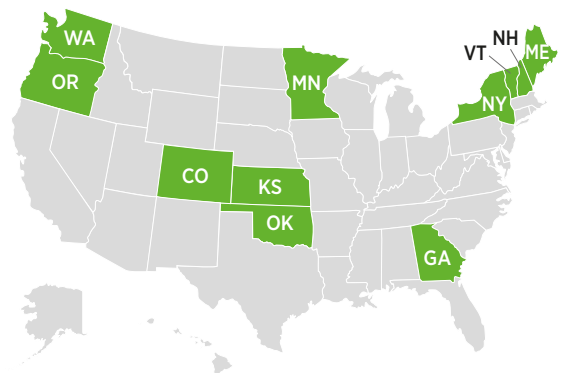
Through five funding cycles, DOE and NREL have awarded 21 subcontracts to 11 companies, totaling \$4.9 million of investment across three research areas.



Funding breakdown for three CIP research areas

- Bergey Windpower (Norman, OK)
- Endurance Wind Power (Seattle, WA)
- Intergrid (Temple, NH)
- Northern Power Systems (Barre, VT)
- Pika Energy (Westbrook, ME)

- Primus Windpower (Lakewood, CO)
- Sonsight (Lawrenceville, GA)
- Urban Green Energy (New York City, NY)
- Ventura Wind (Duluth, MN)
- Wetzel Engineering (Lawrence, KS)
- Xzeres (Portland, OR)





Small wind generators like this Primus Windpower AIR 40 provide battery charging in remote locations. *Photo from Primus WindPower, NREL 44229*

Why the U.S. Department of Energy Invests in the Competitiveness Improvement Project

DOE invests in the CIP to facilitate the development and testing of next-generation wind turbine technology optimized for distributed applications. Cost reductions, more reliable technology, and consumer-friendly business models are making distributed generation more accessible to customers interested in producing their own electricity. CIP-supported efforts enable U.S. leadership in supplying domestic and global markets.

“The CIP program is helping us and other distributed wind original equipment manufacturers be more competitive and create more manufacturing jobs here in the United States.”

—Michael Bergey, President, Bergey Windpower

CIP Highlight: Bergey Windpower Cuts Costs Nearly 50%

BERGEY EXCEL 10

- 20-year-old design
- 9.8 kW
- 7-meter rotor diameter
- Pultruded fiberglass blades
- Power control by furling

Levelized cost of energy: 25¢ per kilowatt-hour



BERGEY EXCEL 15

- 2017 design
- 15.6 kW
- 9.6-meter rotor diameter
- Carbon fiber blades
- Power control by blade stall

Levelized cost of energy: 13¢ per kilowatt-hour



Next-generation, low wind speed technology yields near 50% reduction in levelized cost of energy, making this small wind turbine cost-competitive with solar (photovoltaics)