



NREL data visualizations in wind energy. Photo by Werner Slocum, NREL 81939.

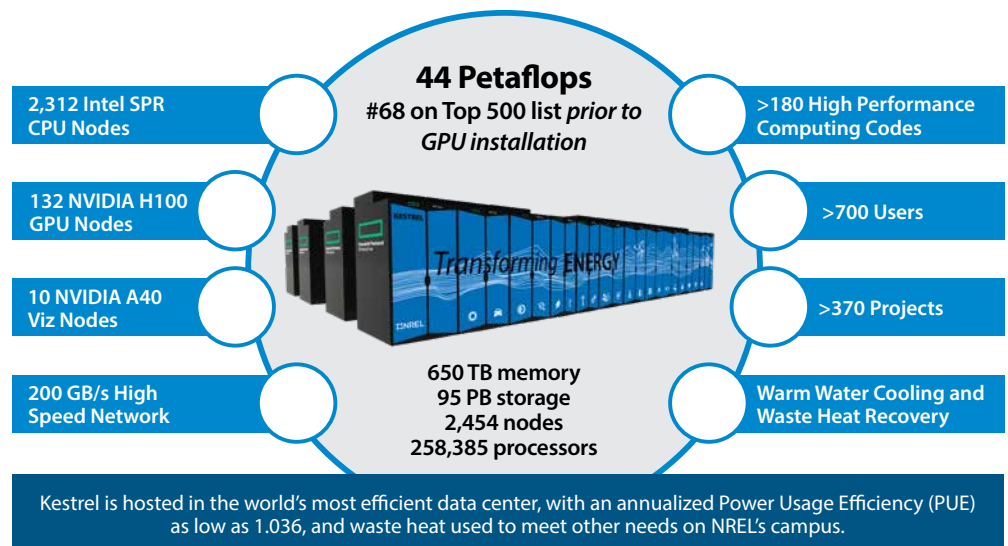
# Transforming **ENERGY** Through Computational Excellence

## NREL HPC Resources for High Performance Computing for Energy Innovation (HPC4EI) Program

NREL hosts computing facilities for the U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy (EERE). In 2024, NREL introduced Kestrel, the 3rd generation, EERE-sponsored supercomputer dedicated to renewable energy and energy efficiency research. Kestrel has already been used for hundreds of research projects by NREL, other national laboratories, and university partners. This includes HPC4EI-sponsored industrial partnerships.

Kestrel is designed with a heterogeneous architecture, combining conventional central processing unit (CPU) nodes with graphics processing unit (GPU) nodes. Researchers leverage Kestrel’s architecture to run traditional

CPU workloads, newer simulations that take advantage of both CPUs and GPUs, and the most advanced GPU-based machine-learning/artificial intelligence techniques. Kestrel is hosted in NREL’s Energy Systems Integration Facility high-performance computing data center, one of the world’s most energy-efficient data centers, as part of NREL’s commitment as a living laboratory for sustainable computing.



Overview of Kestrel. [Review the full specifications.](#) Graphic by Kris Munch/NREL



Fuel injection visualizations at NREL. Visualization by Nicholas Wimer and Nicholas Brunhart-Lupo

## Data Visualization Capabilities at NREL

NREL’s computing capabilities are integrated with the NREL Insight Center’s world-class data science and visualization capabilities. This integration includes immersive visualization capabilities and expert staff in scientific visualization and data science. Insight Center staff work with scientists, industrial partners, and policymakers to ensure that Kestrel’s simulation and data analysis results have the widest possible impact.