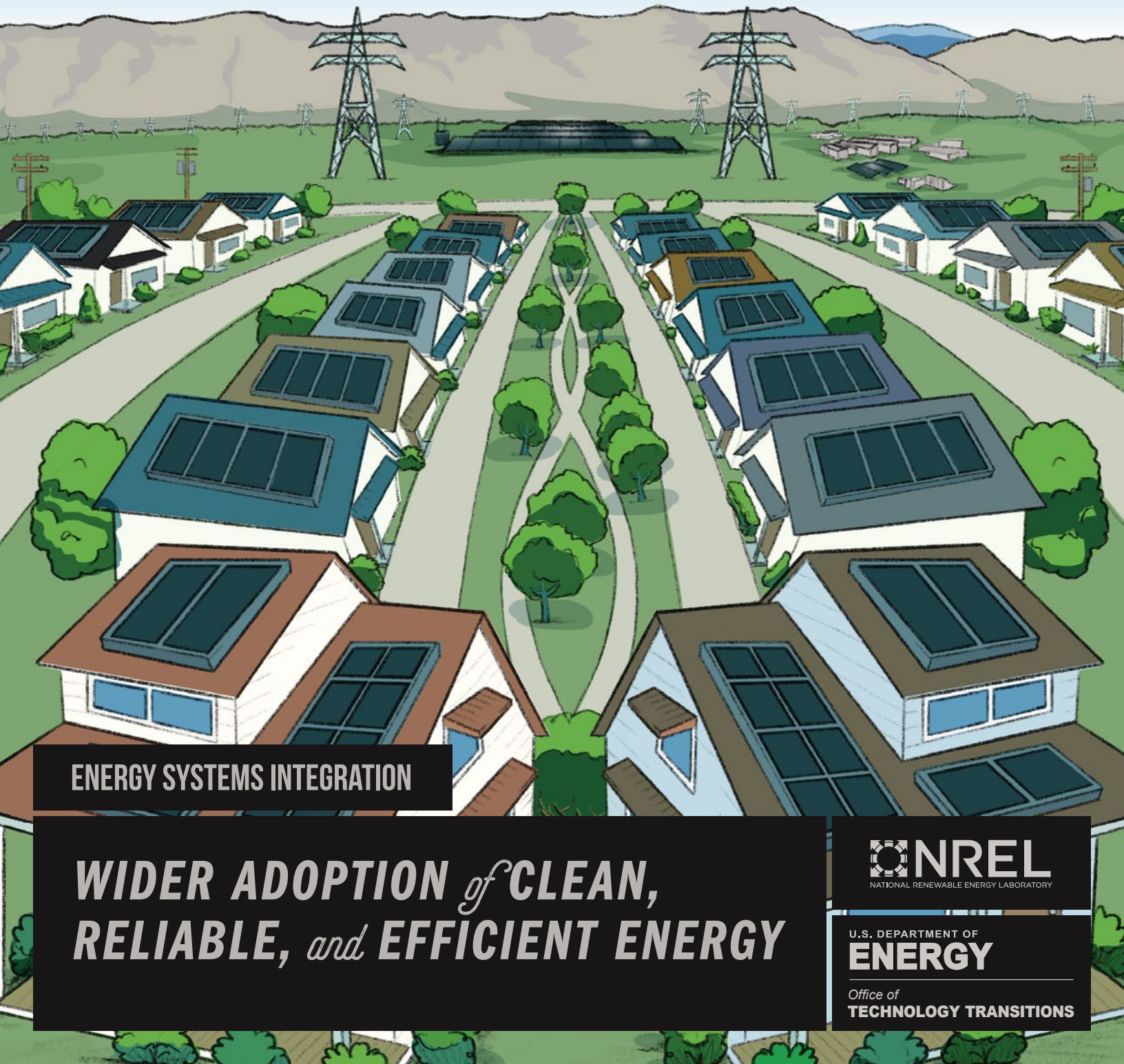


ADVANCING AMERICA *through* TECHNOLOGY TRANSFER

# NATIONAL RENEWABLE ENERGY LABORATORY

REDEFINING *the LIMITS of* DISTRIBUTED  
SOLAR POWER *on THE GRID*



ENERGY SYSTEMS INTEGRATION

**WIDER ADOPTION *of* CLEAN,  
RELIABLE, *and* EFFICIENT ENERGY**

**NREL**  
NATIONAL RENEWABLE ENERGY LABORATORY

U.S. DEPARTMENT OF  
**ENERGY**

Office of  
**TECHNOLOGY TRANSITIONS**



## How do we maximize opportunities for distributed renewable energy?

National Renewable Energy Laboratory (NREL) scientists, in collaboration with industry, used sophisticated test facilities to prove distributed rooftop photovoltaics (PV) could safely connect to the Hawaiian power grid.

The scalable, realistic test environment at NREL's Energy Systems Integration Facility (ESIF) enabled scientists to replicate the larger Hawaiian electrical distribution system, safely push the emulated grid to its limits, and demonstrate the power grid's solar power tolerance. As a result, the allowable Hawaiian solar power ceiling more than doubled, permitting wider adoption of customer-owned PV technology and validating a replicable global model to manage distributed renewable energy.

### NREL at a Glance

NREL's origins trace to the 1973 global oil embargo that crippled America and underscored a critical shortfall in the nation's energy security. At the entrance of the majestic Rocky Mountains, NREL's predecessor – the Solar Energy Research Institute (SERI) – was established in response to the oil crisis with a mission to advance American energy independence through technological development. Today, NREL's world-class researchers and collaborative facilities are advancing the science and engineering of efficient, sustainable, and renewable energy technologies, providing the knowledge to integrate and optimize energy systems, and discovering solutions that transform how the world uses energy.

### U.S. Department of Energy Laboratories

The 17 U.S. Department of Energy (DOE) National Laboratories comprise a preeminent federal research system that executes long-term government scientific and technological missions, often with complex security, safety, project management, or other operational challenges. The National Laboratory system produces the scientific research needed to develop national energy policy and solutions allowing DOE to be one of the largest supporters of technology transfer in the federal government.

### Technology Transitions

The mission of the Office of Technology Transitions (OTT) is to expand the commercial impact of the DOE's research and development portfolio to advance the economic, energy, and national security interests of the Nation. The office develops the Department's policy and vision for expanding the commercial impact of its research investments, and streamlines information and access to DOE's National Labs and sites to foster partnerships that will move innovations from the labs into the marketplace.

[www.energy.gov/technologytransitions](http://www.energy.gov/technologytransitions)

## NREL is helping lead Hawaii's transition to highly renewable electric grids

### Customers

ESIF test results ended a moratorium on PV connections to the grid and cleared a queue of 2,500 waiting customers.

### Standards

ESIF test methods drove the development of new national interconnection and interoperability standards.

### Collaboration

Several industry partners, standards organizations, and research teams worked together to make this leading-edge research possible.

### Contact Us

The scientific discovery highlighted on this poster is just one of DOE's many successes advancing America.

Learn more about available resources and partnering opportunities with the National Labs by visiting:

[www.energy.gov/technologytransitions](http://www.energy.gov/technologytransitions)

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