Pacific Northwest
NATIONAL LABORATORY

Grid Storage Launchpad (GSL)

Energy Storage Systems Safety and Reliability Forum

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Santa Fe, NM

U.S. DEPARTMENT OF ENERGY BATTELLE

PNNL is operated by Battelle for the U.S. Department of Energy

A New Facility at PNNL to Accelerate the Development of Energy Storage Technologies for the United States Grid

ENERGY earthshots U.S. DEPARTMENT OF ENERGY | Storage™

LONG DURATION STORAGE SHOT TARGET

Reduce storage costs by **90%** from a 2020 Li-ion baseline...

...in storage systems that deliver **10+** hours of duration

...in **1** decade

Affordable grid storage for clean power – any time, anywhere

Grid Storage Launchpad (GSL) Facility

- DOE Office of Electricity facility
- Expected occupancy/start of operations: Spring 2024
- 91,000 sq. ft facility
- Provide systematic and independent validation of new grid storage technologies from basic materials and components, through prototyping under grid operating conditions (<100kW)

$75M TOTAL ESTIMATED FACILITY COST

105 WORKSTATIONS

30 LAB MODULES

$35M NON-FEDERAL INVESTMENTS

$15M LD RD

$7M

$8M

$5M BATTELLE

Grid Storage Launchpad (GSL)

Advancing U.S. R&D leadership in energy storage technologies

Validate:

Independent testing of next generation storage materials and systems (<100kW/400kWh) under realistic grid operating conditions

Accelerate:

Reduce risk and speed development of new technologies by propagating rigorous grid performance requirements to all stages of development

Collaborate:

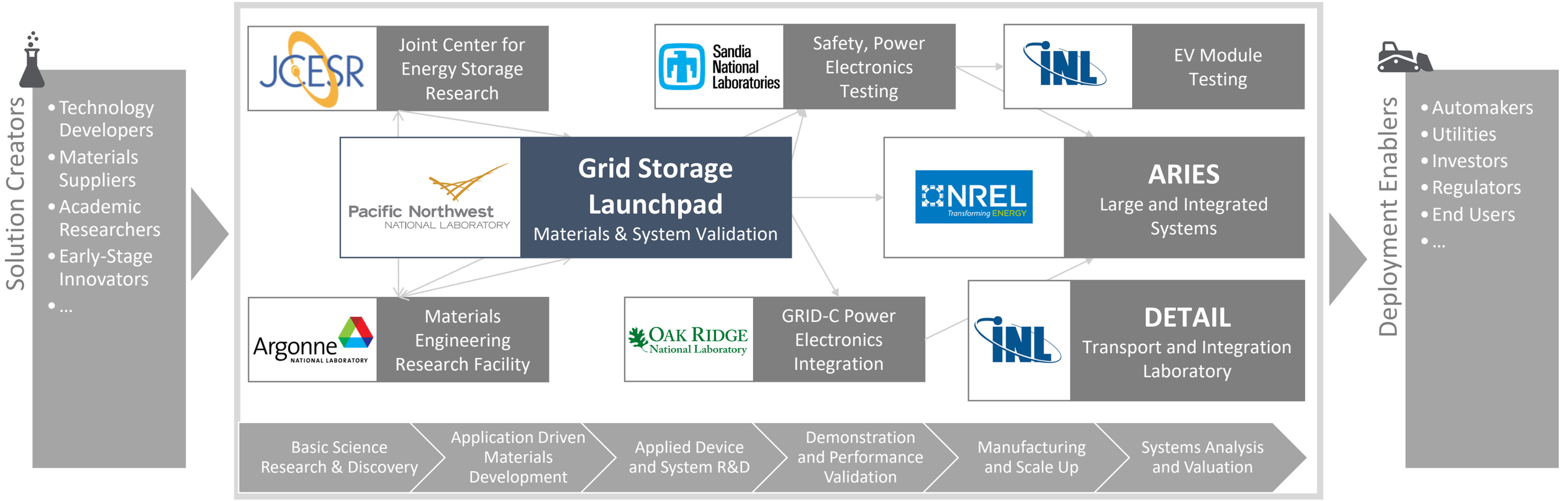
Link DOE and storage R&D communities in a new collaboration center to solve key crosscutting challenges.

Educate:

Provide standardized training and development of the next generation workforce, from skilled labor to first responders and safety officials, to utility planners and regulators.

Validate | Accelerate | Collaborate | Educate

Collaborative Effort Within the DOE Complex

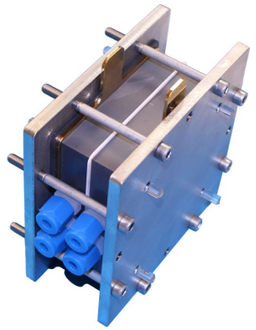


Accelerate	Validate	Collaborate	Educate
•Materials discovery and development	•Technologies under realistic grid conditions up to 100 kW/400kWh	•Provide linkages to other DOE complex capabilities •Consolidated PNNL storage capabilities	•Provide training for next generation workforce

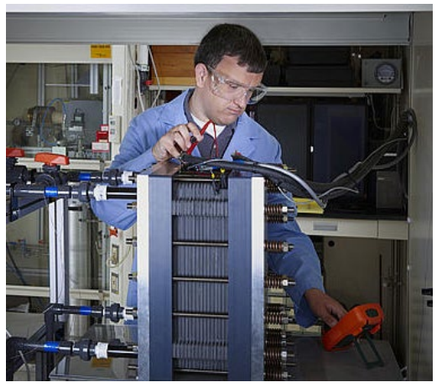
Grid Storage Launchpad

<u>Validating</u> performance of new technologies across scales to de-risk industry acceptance

Novel Storage Materials/Cells



Prototype Device



< 100kW Systems

Field Validation and Qualification

GSL

GSL Floorplan/Functionality

Entry

100kW Test Chambers

Device Prototyping (ABF)

Materials Development

In-Operando Characterization

Education Labs

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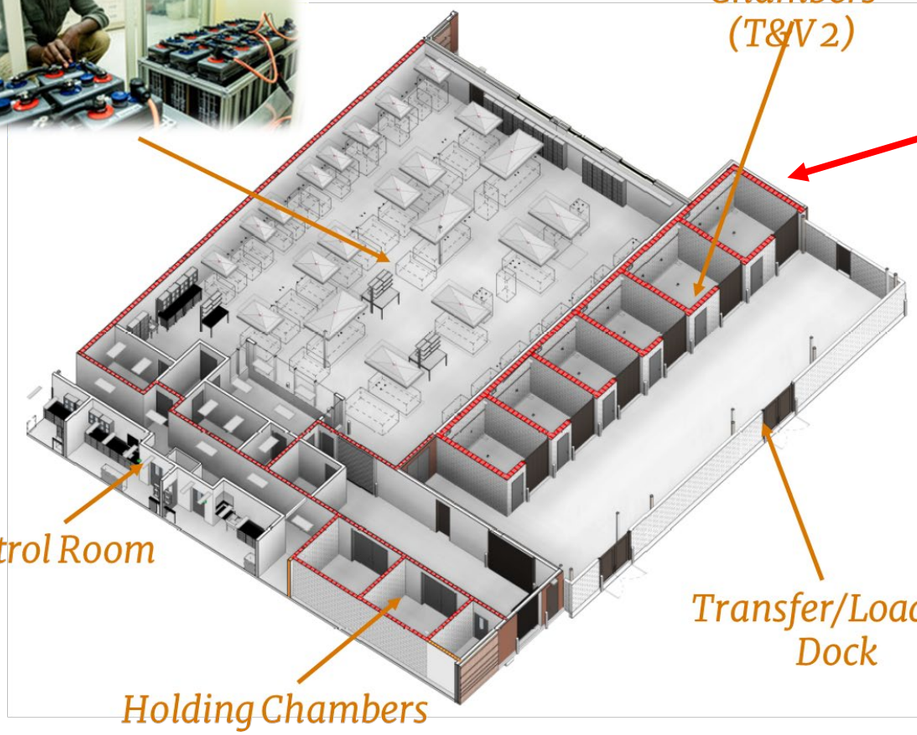
GSL Lobby

GSL Test and Validation

1-10 kW Test Area (T&V1)

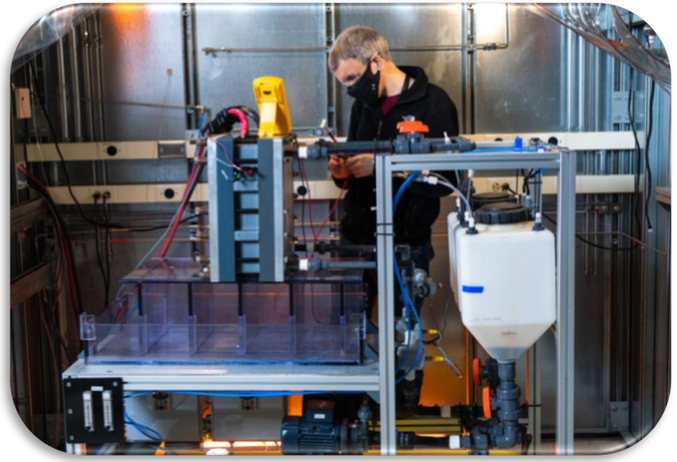


Validation
100kW Testing Chambers

Device Prototyping

Advanced Battery Facility (ABF)

Redox Flow Prototyping



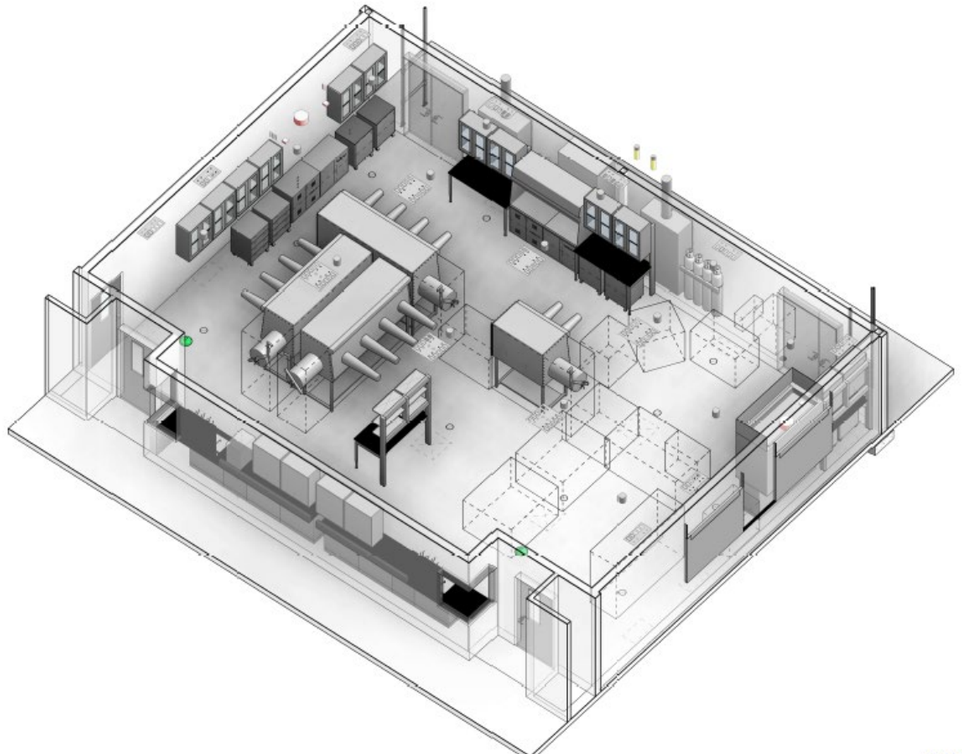
GSL In-operando Center

$8.3M WA State Investment

Nexsa X-Ray Photoelectron Spectrometry System, with glovebox

Helios Hydra UX Plasma Focused Ion Beam Scanning Electron Microscope

Spectra 300 Scanning Transmission Electron Microscope



GSL Construction

GSL Groundbreaking Ceremony 04-21-22

April June August September October

GSL Design and Construction Update

- Construction started Feb 2022
- Structural Steel, with exception of T&V 2 area, completed August 2022
- T&V 2 area Design complete October 2022
- Facility dried in (weather resistant) Feb 2023
- Facility ready for operation 2024

- $8.3M in equipment received from WA DOC contribution, temporarily installed and operational until GSL opens.
- 4th Year of ESMI Initiative developing AI/ML tools to accelerate flow battery development.

The Grid Storage Launchpad

https://www.youtube.com/watch?v=NwphB8WBYG8

https://www.pnnl.gov/grid-storage-launchpad-pnnl

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