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National Institute of Technology and Evaluation

NLAB

National LABoratory for advanced energy storage technologies

The World's Largest Testing and Evaluating Facilities for Large-Scale Battery Energy Storage Systems (BESS)

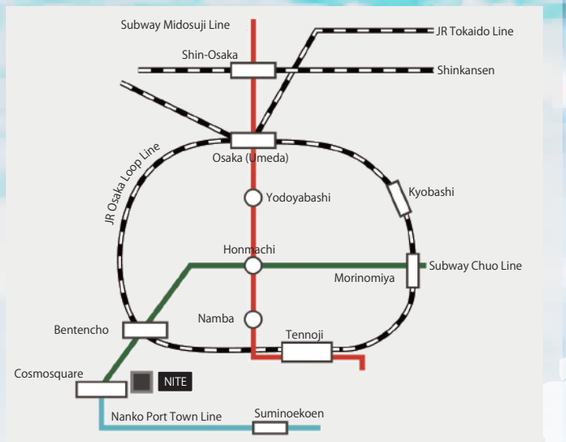
ACCESS

Access by Railway

- Osaka Municipal Subway Chuo Line
  10 minutes' walk from Cosmo Square Station Exit 2

Access by Car

- 50 minutes from Kansai International Airport
- 40 minutes from Itami Airport
- 30 minutes from Shin-Osaka Station



http://www.nite.go.jp/gcet/nlab/index.html

National LABoratory for Advanced Energy Storage Technologies (NLAB)
Global Center for Evaluation Technology (GCET)
(Independent Administrative Agency) National Institute of Technology and Evaluation

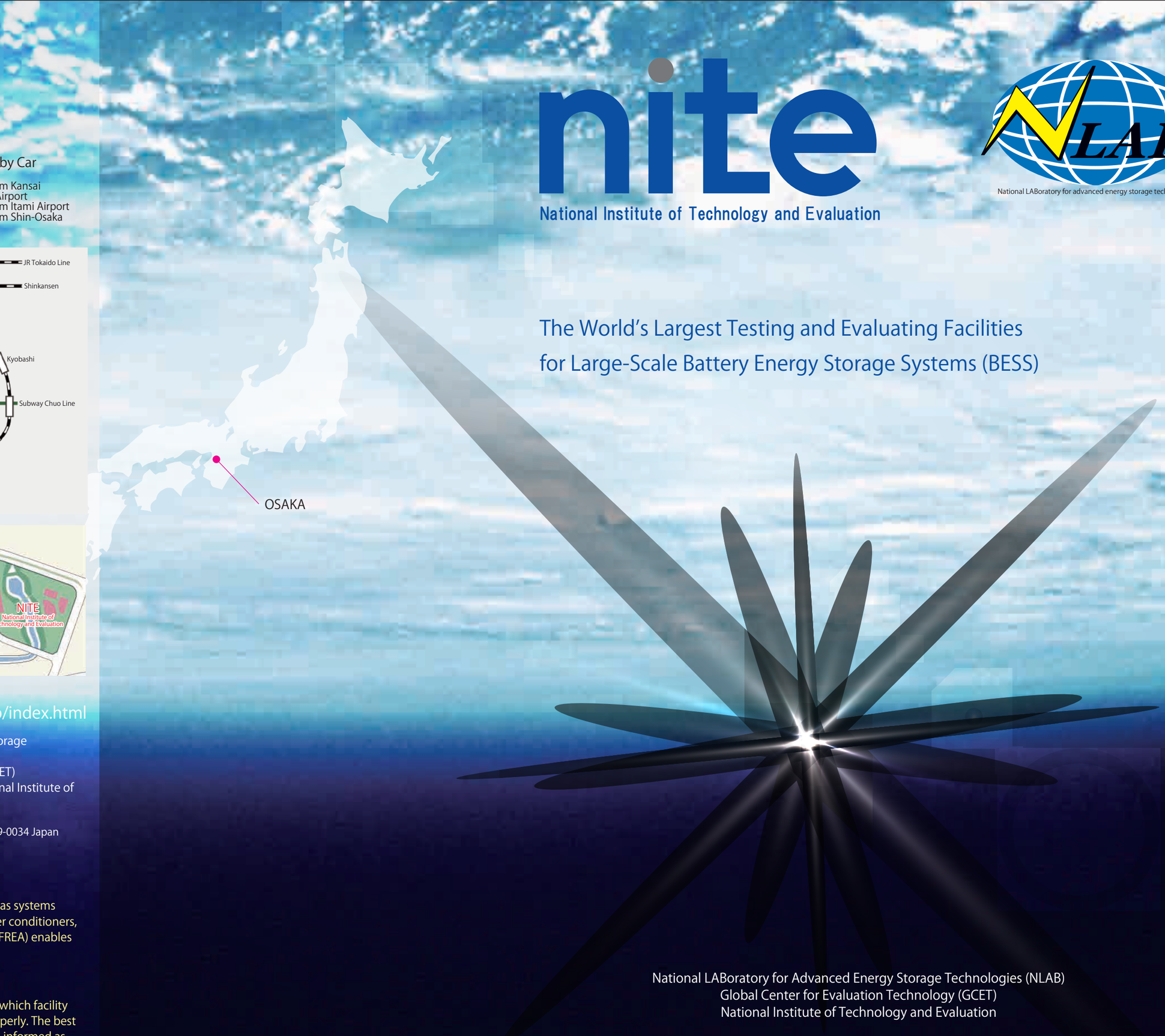
1-22-16 Nankokita, Suminoe, Osaka-city, Osaka 559-0034 Japan

E-mail. nlab-sd@nite.go.jp

For various performance testings and others as systems combining large storage batteries with power conditioners, The Fukushima Renewable Energy Institute (FREA) enables clients to conduct testing accordingly.

E-mail. frea-ss-info-ml@aist.go.jp

Please contact either FREA or NLAB about at which facility clients may conduct your specific testing properly. The best feasible (implementation) method should be informed as FREA and NLAB consider together.



National LABoratory for Advanced Energy Storage Technologies (NLAB)
Global Center for Evaluation Technology (GCET)
National Institute of Technology and Evaluation

Our storage technology to global standard upwards

As safe and reliable technology the world needs and demands
Committed to bring global standard to the world

NLAB Large Chamber

As Large-Scale Laboratory Building Utilised for Various Purposes

- Serves as constant temperature chamber at the world's largest class.
- Conducts testing large-scale storage batteries at the mega-watt class.
- Equipped with both anti-explosion and fire-resistant structure, and also smoke control facilities in cases of explosion and fire.

Propagation Test

Observes propagation to the surroundings even when a single-cell or module get ignited.

BMS Operation Test

Conducts operation testing on battery management systems (BMSs) of pack or container-size batteries when emergencies occur, including over-current, over-voltage, over-charge and discharge.

Submersion and Immersion Test

Conducts submersion and immersion testing on pack-size storage batteries that assumes flood or tsunami disaster.

Perfomance Test on Fire Extinguishing Equipment

Conducts operation testing on fire extinguishing equipments when pack and container-size batteries get ignited.

The World's Largest Testing and Evaluating Facilities for Large-Scale Battery Energy Storage Systems (BESS)

NLAB Power Unit

Power Supply Equipment for Test Use

- Equipped with unique storage battery system controlled to charge and discharge objects under test.
- Conducts testing both at the range of 50Hz and 60Hz
- Applicable to variable voltages assuming the practical use in Europe, the US and Japan.

NLAB Testing Facilities

As Laboratories per Function

- Conducts wide range of testings on large-scale modules and pack-size batteries.
- Designed with specification capable of safe testing even when objects under test get ignited or fire.

Seismic Wave Reproduction Test

Reproduces perfectly (by 100%) seismic waves seen at Great East Japan Earthquake, Great Hanshin-Awaji Earthquake etc.

UN Transport Vibration Test

Conducts vibration testing based on international standards, including UN Recommendation on the Transport of Dangerous Goods. ASTMD4169, JIS Z 0232, UL 1642, UN38.3 etc.

Charge and Discharge Test

Conducts charge and discharge testing under variable-temperature conditions. JIS C 8712, JIS C 8715-2, UL 1642, UL 1973, UN 38.3 etc.

External Short-Circuit Test

Conducts external short-circuit testing on module or pack-size storage batteries. JIS C 8712, JIS C 8715-2, UL 1642, UL 1973, UN 38.3 etc.

Destructive Test

Conducts nail-penetration and crushing testing on storage batteries down to the module range. JIS C 8712, SAE J2464, UL 1642, UL 1973 etc.

Drop Test

Conducts drop testing on module and pack-size storage batteries. JIS C 8712, JIS C 8715-2, UL 1973 etc.

- Regarding the actual testing style, NLAB usually employ the joint one that clients and NLAB shall conduct.
- Our test services will be provided, as our considering the roles both established test organizations and NLAB perform.