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**ELECTRICAL RESEARCH AND  
DEVELOPMENT ASSOCIATION**



**RENEWABLE ENERGY TEST FACILITIES**

Electrical Research and Development Association (ERDA) is a not for profit autonomous organization offering its services under three verticals namely Testing and Evaluation, Field Services and R&D and Expert Services to Power Utilities, Process Plants and manufacturing Industries.

Existing fossil fuel based energy sources (coal, oil etc.) are not sustainable as these sources pollute the environment. Renewable energy sources (solar, wind) are having enormous potential and are extremely suitable for countries like India. Being relatively new and evolving technologies, there is great scope for Research and Development in the area of renewables and ERDA has established all required infrastructure on this emerging technology front. A capability profile of ERDA in the field of Renewable Energy is presented below.

## TESTING AND EVALUATION

### Solar Pump Test Facility (MNRE Approved for Range up to 10 HP)

- State-of-the-art test facility established as per guidelines specified by MNRE
- Advanced PV array simulator and PV panel mounting structure with auto tracking system
- Precise digital pyranometer for sun irradiance measurement
- Precise power analyzer for PV power measurement
- Precise magnetic flow meter and pressure transducer for flow and head measurement with data logging facility

### Life Cycle Evaluation for Solar Batteries

- Capability for evaluation of 1A to 2000A & 1V to 72V DC battery rating
- Capability for percentage capacity evaluation between fully charged & load cut off conditions

### Solar Cables Test Facility

Harnessing solar energy through photovoltaic systems has become one of the highly preferred green energy options, today. The power generated by PV arrays is carried by solar cables to storage batteries. Since a solar cable has to function in open atmosphere over a long period, it has to withstand all environmental severities such as UV radiation, rain, dust, temperature variations, humidity, insects, microbes etc.

ERDA has state-of-the-art testing facilities for quality evaluation of Solar Cables as per international standards BSEN 50618 and TUV 2Pfg 1169.

### Solar Inverter Test Facility

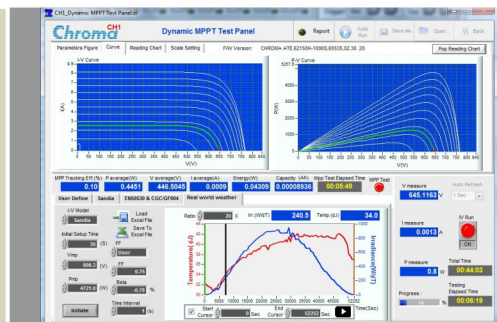
- DC power, AC Power and Efficiency measurement as per IEC 61683
- Environmental Tests as per IEC 60068-1, IEC 60068-2, IEC 60068-14 and IEC 60068-30



Outdoor Setup with Pyranometer



Programmable Weather Chamber



Summer Profile Screen of Array Simulator



### Solar PV Panel Test Facility (Traceable to NREL, USA)

- Capable to test solar PV module of upto 400 Wp (Max. size 2m x 1m)
- Single flash long pulse duration: 20-100 ms at 1000 W/m<sup>2</sup>
- Range of light intensity: 200 – 1100 W/m<sup>2</sup>
- Measurement duration: <1 Second
- Conforming to IEC: 60904-9, PV reference module conforming to IEC 60904-2, I-V characteristic measurement system with software conforming to IEC: 60904-1

### Solar Lighting Test Facility

- Complete certification facility for Solar lantern, Home Lighting & Street Lighting as per MNRE Specifications
- Type 'C' Moving Mirror Goniophotometer for Photometric measurement of Lightings
- Cyclic chambers for Environmental & Humidity testing of PV modules

### Developmental Testing of Renewable Energy Products (IS/IEC)

- Solar Home / Street Lighting Systems
- Solar Lanterns
- CFL / LED based Luminaire
- Crystalline Silicon / Thin Film Terrestrial PV Modules
- Stationary Lead Acid / VRLA Gel Type Batteries and Associated Solar Panels
- Solar Inverters & Charge Controllers

## FIELD SERVICES

### Condition Monitoring

ERDA provides a wide range of diagnostics service for health assessment of Electrical equipment of substations. Major equipment monitored by the diagnostics group are Transformers, Switchgears, Cables, Lightning Arresters etc. The experience base of ERDA in Electrical Diagnostics includes more than 370 Transformers, 1000 Motors, 60 Generators, more than 6000 Dissolved Gas Analyses and 500 Furan Analyses of oil every year.

## R&D AND EXPERT SERVICES

### Renewable Energy Integration Studies

ERDA provides a range of expert services for the renewables sector. These include Power Systems Studies, Power Quality Measurement, Mitigation Solutions and Integration Studies.

ERDA is equipped with Mi-Power, ETAP, EMTP-RV softwares for following studies in the Renewables Sector:

- Power Evacuation Study
- Load Flow Study
- Short Circuit Study
- Harmonic Analysis
- Relay Co-ordination



Solar Sun Simulator



Substation of a Wind Farm



Condition Monitoring of Transformer

## Anti-Dust, Self-Cleaning Nano Crystalline Coating for Solar Panels

ERDA has developed an Anti-Dust Coating for PV Panel which is a solution to PV cleaning since the solar energy conversion efficiency is mainly reduced by dust, grime, pollen, and other particulates that accumulate on the solar panel. A dirty solar panel can reduce its power capabilities in high dust/pollen or desert areas.

### Salient Features & Benefits:

- Coating Type: Inorganic nano-coating
- Temperature range of use: 0 °C to 60 °C
- Coated panel conforms to IEC-61215 for evaluation in simulated conditions
- Excellent Anti-dust properties, decomposes hydrocarbons and prevents organic growth
- Reduces cleaning frequency and hence, saves expenditure for cleaning
- No accumulation of dust on solar panels and hence, no power generation loss
- Total saving in expenditure can be equivalent to 15% of power generation loss



## ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

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