



**NEW AND RENEWABLE ENERGY DEVELOPMENT CORPORATION OF
ANDHRA PRADESH LIMITED (NREDCAP)
(A State Government Company)**

Regd. Office:# 12-464/5/1, River Oaks Apartment, CSR Kalyana Mandapam Road,
Tadepalli, Guntur District, Pin: 522 501.Email: vc@nredcap.in, ev@nredcap.in,
gm@nredcap.in

Ref: NREDCAP/EV/APSSDC/18-01/2023

Date: 14.06.2023

**Tender for Supply, Installation, Commissioning and Maintenance of EV Automotive
Training Lab Equipment/Education Training Lab Equipment and Impart Training to
the Master Trainers & Trainees**

Inviting Bids from **EV Automotive Training Lab Equipment Manufacturers** for supply of EV Automotive Training Lab Equipment for Electric 2-Wheeler, 3-Wheeler, 4-Wheeler i.e., including 1.2 KW Lithium ion Battery, Charger & Discharger Test set up with software for EV Lab, E Vehicle BLDC (HUB) Motor Trainer set up -1KW/48V with Spring balance Load set up, BLDC Drive, Panel & meter set up, etc., as per detailed annexure -A to I along with specifications. The systems shall be supplied on Turnkey basis with One year warranty to Skill Training Academy, Pulivendula on or before 30.06.2023 to train the un employed youth/ existing ICE Mechanics/ITI/Diesel Mechanics etc.,

The suppliers shall have 3 years' experience in supply of EV Automotive Training Lab Equipment / Education Training Lab Equipment (Copies of the work completion reports to be enclosed) and minimum cumulative turnover of Rs. 2.00 Crores during the last 3 financial years in EV Automotive Training Lab Equipment / Education Training Lab Equipment (Enclose copy of the copy of IT Returns/ certificate issued by Chartered Accountant). The suppliers have not been black listed at any time by NREDCAP as well as any of the Govt. Nodal Agencies in the country. If required, the suppliers shall demonstrate the EV Automotive Training Lab equipment for which they are submitting their financial offer at NREDCAP Head Office, Tadepalli, Guntur District.

The suppliers fulfilling the eligibility criteria shall submit their sealed Technical & financial quotations in the formats enclosed **on or before 21.06.2023, 11:00 AM** along with an **Earnest Money Deposit of Rs. 25,000/- (Rupees Twenty Five thousand only)** in the form of DD/ RTGS from any Nationalized Bank drawn in favour of NREDCAP, which is refundable after finalization of the bids.

**Sd/-
VC & Managing Director**

1. NREDCAP reserves the right to modify, amend or supplement or cancel this Tender document, without any prior notice or without assigning any reason.

Authorised Person: The VC & Managing Director, NREDCAP

Address: 12-464/5/1, River Oaks Apartment,

CSR Kalyana Mandapam road,

Tadepalli,

Guntur District

Tel: 0863 -2347650 /651/652/653

Email: vc@nredcap.in; ev@nredcap.in; gm@nredcap.in

Place: Tadepalli

Date :14.06.2023

2.Nodal Person for enquiries and clarifications

All correspondence, clarifications in respect of the Bid document and submission of the Bid shall be addressed to:

Designation:	VC & Managing Director, NREDCAP
Address:	12-464/5/1, River Oaks Apartment, CSR Kalyana Mandapam road, Tadepalli, Guntur District
Telephone:	0863 -2347650 /651/652/653
E-mail id:	vc@nredcap.in ; ev@nredcap.in ; gm@nredcap.in

**TECHNICAL SPECIFICATIONS OF EV AUTOMOTIVE TRAINING LAB
EQUIPMENT**

S.No	Description	Specifications	Qty
01	1.2 KW Lithium ion Battery, Charger & Discharger Test set up with software for EV Lab	<ul style="list-style-type: none"> • Application - Li-Ion Battery 36V to 72V • Discharging Current - 0.5 - 20A • Resolution - 0.1A • Charging Cut Off - 22V - 90V (Adjust as @0.1A) • Discharging Cut Off - 22V-90V (Adjust as @0.1V) 	02 Sets
02	E Vehicle BLDC (HUB) Motor Trainer set up -1KW /48V with Spring balance Load set up, BLDC Drive, Panel & meter set up	<ul style="list-style-type: none"> • Input : 0-60 /72 VDC from battery • Output : Suitable for BLDC Motor • Power : 360W or 1KW 	01 Set
03	E Vehicle SR Motor Trainer set up -1KW /48V with Spring balance Load set up, SR Drive, Panel & meter set up	<ul style="list-style-type: none"> • Input : 0-60 /90 VDC from battery • Output : Suitable for SR Motor • Power : 1 KW 	01 Set
04	E Vehicle PMSM Motor Trainer set up -1KW /48V with Spring balance Load set up, PMSM Drive, Panel & meter set up	<p>PMSM Motor (6 phase)</p> <ul style="list-style-type: none"> • Type - 6 Phase PMSM Motor • Voltage - 48V • Power - 1KW • Speed - 2500 RPM <p>E vehicle Motor Controller (PMSM Drive)</p> <ul style="list-style-type: none"> • Input : 0-60 /90 VDC from battery • Output : Suitable for SR Motor • Power : 1 KW 	01 Set
05	E Vehicle Two wheeler Trainer set up	As per Annexure - B	02 Sets
06	E Vehicle Three wheeler Trainer set up	As per Annexure - C	01 Set
07	E Vehicle Four wheeler Trainer set up	As per Annexure - D	01 Set

08	E Vehicle Two wheeler Dismantling and Assembling kit	As per Annexure - E	01 Set
09	Teaching (Class Room) Aids	As per Annexure - F	01 Set
10	Tools	As per Annexure - G	05 Sets
11	Safety Equipment (for 30 students)	As per Annexure -H	01 Set
12	Experimental Tables and Chairs for training lab	As per Annexure - I	01 Set
13	Computers (Make: HP)	<ul style="list-style-type: none"> • Make: HP • i3 Processor • 8GB RAM • 120 GB SSD Hard Disk • 22 inch LED Monitor • Keyboard • Mouse • And related items 	05 Sets

Date:

Signature of the Tenderer / Manufacturer with seal

Electric Vehicle -Two Wheeler Trainer Set up

Set up designed to study the connection procedure and testing procedure of electric 2 wheeler set up using various components of electric vehicle like battery (or DC Source), BLDC Hub Motor, Drive etc. Set up consists of,

Motor

- Motor Type : BLDC Hub Motor
- RIM/HUB Size : 10Inch
- Voltage : 36V
- Motor Power : 800W or 1000W
- Maximum speed : 20-25KMPH
- Sensor : 3 Numbers of Hall sensor
- Tire : Brand New

Controller

- Type : MOSFET based Controller
- Input Voltage : 48-60VDC
- Maximum Current : 30A

Battery

- Type : lithium ion battery
- Voltage : 48V
- Power/Current : 12Ah
- Features : in built BMS with **PC interface Software and Bluetooth-Mobile App software**

Charger

- Type : MOSFET based Charger
- Input Voltage : 170-250VAC
- Output Voltage : 54V
- Charging Current : 6A
- Charging Time : 4-5 Hour
- Features : LEDs for status indicator

Panel

- Powder coated M.S Panel with diagram Stickered front panel to fix the Above Motor, controller and Battery and also to fix the below mentioned components
 - Handle with throttle for speed control
 - F/R selection switch, Left /Right indicator switch with Lamp
 - Head light switch with Lamp, Horn switch with buzzer
 - Brake control lever(optional)

- Digital LCD-indicator ,To indicate
 - ✓ Motor Speed in KM/H
 - ✓ Battery Voltage level in % & Numerical value
 - ✓ Left indicator status
 - ✓ Right indicator status
 - ✓ Head light Indicator status
- ON/OFF Switch with Key
- DC-DC Converter for Light (48V TO 12V, 10A)
- Necessary Banana terminals provided for motor, Battery, Controller input and outputs terminations for external patching.
- Necessary terminations for controller control signal (like hall sensor, indicator, throttle) output and inputs for external patching.
- Necessary Fuse and MCB provided for battery, Motor

Features

- Provision / Facility to Interface with External IGBT Power Module and Controller set up (FPGA /MATLAB/DSPIC etc)- for Motor control and testing

Optional Features

1. Spring balance load set up with dial indication facility for HUB Motor (**OP1**)
2. PC Software for BMS -Smart Battery (**OP2**)
3. Blue tooth Mobile app- connectivity for BMS -Smart Battery (**OP3**)

Possible Experiments

1. Study and testing of speed control of Hub Motor used in two wheelers
2. Study and testing of Two wheeler control components functions (throttle function , F/R switch function , Left /Right indicator switch function, Head light switch function, Horn switch function, Brake control lever function, Digital LCD-indicator function etc)
3. Study and Testing of battery charging and discharging - BMS system using PC Software and Mobile blue-tooth App (**Computer /Mobile will be provided by user**)- **optional features**
4. Load test of HUB Motor -**optional features**

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E Vehicle – Three wheeler Trainer set up

Set up designed to study the connection procedure and testing procedure of electric 3 wheeler set up using various components of electric vehicle like battery (or DC Source), EV Motor, Drive etc. Set up consists of,

Motor

- Motor Type : BLDC / PMSM Motor
- Voltage : 48V / 60V
- Motor Power : 1KW / 3KW
- Tire : Brand New

Controller

- Type : BLDC / PMSM drive
- Input Voltage : 48-60VDC

Battery

- Type : lithium ion battery
- Voltage : 48V / 60V
- Power/Current : 1.2K/2KW

Charger

- Type : MOSFET based Charger
- Input Voltage : 170-250VAC
- Charging Time : 4-5 Hour
- Features : Led's for status indicator

Features

- Handle with throttle for speed control
- F/R selection switch, Left /Right indicator switch with Lamp
- Head light switch with Lamp, Horn switch with buzzer
- Brake control lever(optional)
- Digital LCD-indicator ,To indicate
 - ✓ Motor Speed in KM/H
 - ✓ Battery Voltage level in % & Numerical value
 - ✓ Left indicator status
 - ✓ Right indicator status
 - ✓ Head light Indicator status
- ON/OFF Switch with Key
- DC-DC Converter for Light (48V TO 12V, 10A)
- Necessary Banana terminals provided for motor, Battery, Controller input and outputs terminations for external patching.

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E Vehicle - Four wheeler Trainer set up

- Mid drive Motor & Drive
 - One number of 48V/1.2KW, 6 Phase PMSM Motor with controller
 - Suitable differential gear arrangements to fix the above motors
- Battery & Charger
 - One number of 48V/2KW Lithium ion battery with smart BMS
 - Blue tooth / RS485/CAN Communications for BMS Output
 - Suitable charger for battery charging purpose
 - Charging time 4-5Hours
- Vehicle Dimensions
 - 4 feet (W) , 7 feet (L) +/-10% Variations
 - Ground Clearance -375MM
 - Curve Weight-200kg
- General Features
 - Speed 35-40KMPH
 - Millage range -30-40km Per charge
 - Charging time 4-5Hours
- Digital indicator with RS485 Output
 - PLC/Other type controller with 7 inch HMI provided to indicate -Motor speed in RPM , Vehicle KMPH , Battery current, Voltage & Energy etc
- Special Features
 - Provision to interface external PWM Controller & IGBT module for BLDC Motor control

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E Vehicle-Two wheeler Dismantling and Assembling kit

- Brand new working E Vehicle Two wheeler
- Study of various parts of the E Vehicle
- Study of Dismantling of the E Vehicle
- Study of assembling of the E Vehicle
- Study of E Vehicle Motor
- Study of E Vehicle Motor controller
- Study of E Vehicle Battery
- Study of E Vehicle wiring
- Study of E Vehicle various controls of forward / reverse / break / light control

Date:

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Teaching Class Room Items

- White Board (4ft X 3ft) with Marker - 3No
- LCD Projector with screen - 1 No
- Charts - 10 Nos

Good quality charts / laminated / painted pictures and drawings to study / demonstrate the electric vehicle principals, operations, various parts like DC source / Battery / ev motor / drive controller etc., in the area allocated for EV Automotive Training Lab.

Date:

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Tools (Suitable for Electric Vehicle / Make: PYE/TAPARIA/STANLEY/Reputed make)

- Soldering Iron with accessories
Soldering Iron, stand, lead roll and desoldering gun
- Digital Multimeter
Fluke make Digital Multimeter (model 17B+)
- Crimping Tool
- Tong Tester -Clamp Meter
- Meco make Digital clamp meter (Model 36 Auto BL)
- Circuit Tester
- Engineering Rule
- Mallet hard wood
- Hammer, ball peen With handle
- Allen Key alloy steel
- Bearing / Gear Puller
- Vernier Caliper
- Pliers
- Pliers long nose insulated
- Pliers round nose insulated
- Screw driver set
- Ring Spanner set
- Open ended Spanner set
- Tool Box

Date:

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Safety Items

For 30 students

- Safety Shoe - 30 set
- Ear plug - 30 set
- Goggles - 30 Nos
- Gloves - 30 set
- Helmet - 30 Nos

For 5 groups

- First-aid kit - 5 Nos
- Fire extinguisher - 5 Nos

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Experimental Tables and Chairs

Experimental / Work Tables – 10 Nos

- Powder coated MS square tube and two foot rest arrangement on bottom side
- Double side laminated plywood top
- Length 5 ft and above
- Width 2 1/2 ft and above
- Height of the table 2 ft 9 inches

Experimental Table Stool – 70 Nos

- Powder coated MS square tube and two foot rest arrangement on bottom side
- Double side laminated plywood top
- Length 1 ft
- Width 1 ft
- Height of the table 2 ft

Date:

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FINANCIAL OFFER**FINANCIAL OFFER FOR SUPPLY OF EV AUTOMOTIVE TRAINING EQUIPMENT ON TURNKEY BASIS AS PER ANNEXURES, SPECIFICATIONS IN THE TENDER**

S.N	Description	Qty	Price
01	1.2 KW Lithium ion Battery, Charger & Discharger Test set up with software for EV Lab	02 Sets	
02	E Vehicle BLDC (HUB) Motor Trainer set up -1KW /48V with Spring balance Load set up, BLDC Drive, Panel & meter set up	01 Set	
03	E Vehicle SR Motor Trainer set up -1KW /48V with Spring balance Load set up, SR Drive, Panel & meter set up	01 Set	
04	E Vehicle PMSM Motor Trainer set up - 1KW /48V with Spring balance Load set up, PMSM Drive, Panel & meter set up	01 Set	
05	E Vehicle - Two wheeler Trainer set up (As per Annexure-B)	02 Sets	
06	E Vehicle -Three wheeler Trainer set up (As per Annexure-C)	01 Set	
07	E Vehicle- Four wheeler Trainer set up (As per Annexure-D)	01 Set	
08	E Vehicle- Two wheeler Dismantling and Assembling kit (As per Annexure-E)	01 Set	
09	Teaching Class Room Items (As per Annexure-F)	01 Set	
10	Tools (As per Annexure-G)	05 Sets	
11	Safety Items (for 30 students) (As per Annexure-H)	01 Set	
12	Experimental Tables and Chairs (As per Annexure-I)	01 Set	
13	Computers (As per item no.13 in Annexure-A)	05 Sets	

The supplier shall supply, install, commission, maintain and impart training to the master trainers & trainees as well for a period of 2 months from the date of commissioning.

Date:**Signature of the Tenderer / Manufacturer with seal**

TERMS AND CONDITIONS

1. The Specifications of the EV Automotive Training Equipment & Education Training Equipment as mentioned in the enclosed **Annexure - 'A to I'** shall be supplied, installed, commissioned on or before 30.06.2023.
2. The supplier shall quote for all the items and the rates quoted in the financial offer (Annexure - J) shall inclusive of transportation Charges and all taxes applicable. Partial quotes will be Rejected.
3. The filled in document together with all enclosures shall be submitted in a sealed cover super scribing **“FINANCIAL OFFER FOR EV AUTOMOTIVE TRAINING LAB EQUIPMENT / EDUCATION TRAINING LAB EQUIPMENT”**.
 - i. Turnover Certificate
 - ii. IT Returns
 - iii. GST Certificate
 - iv. PAN Certificate
 - v. ROC/Partnership Deeds
 - vi. Proof of supply of EV/ Educational Training Lab Kits during the last 3 years
4. Good quality components should be supplied. In case if it is found that materials are not as per Standard Specifications, such components are to be replaced at free of cost.
5. All the EV Automotive Training Systems including Battery should be under guaranteed for a period of **ONE Year** from the date of installation against all defects.
6. The VC & Managing Director may relax any of the conditions for valid reasons and the decision of VC & Managing Director is final and binding.
7. Payment Terms:
 - A. 70% Payment will be released against supply of EV Automotive Training Equipment and on submission of certified bills certified by the District Manager, NREDCAP, Kadapa.
 - B. 25% Payment on installation, commissioning of Equipment and handing over the equipment to DM, NREDCAP, Kadapa
 - C. 5% on Successful maintenance of Equipment for a period of one year
8. The supplier shall supply, install, commission, maintain and impart training to the trainees & master trainers for a period of 2 months from the date of commissioning.
9. The supplier shall handover the equipment in good condition after installation & commissioning to the District Manager, NREDCAP, Kadapa.
10. All disputes are subjected to Guntur jurisdiction only.

Date:

Signature of the Tenderer / Manufacturer with seal

STATEMENT – I

Information on litigation history in which Tenderer is the Petitioner.

S.No	Case No/Year	Court where filed	Subject Matter/ Prayer in the case	Respondents	Present stage

Date:

Signature of the Tenderer / Manufacturer with seal

STATEMENT -II

DECLARATION

I /We Have gone through carefully all the Tender conditions and solemnly declare that I/We will abide by any penal action such as disqualification or black listing or determination of contract or any other action deemed fit, taken by, the Department against us, if it is found that the statements, documents, certificates produced by us are false/fabricated.

I/We hereby declare that, I/We have not been Blacklisted/debarred/Suspended/demoted in any department in Andhra Pradesh or in any State due to any reasons.

Date:

Signature of the Tenderer / Manufacturer with seal