राष्ट्रीय सौर उर्जा संस्थान
National Institute of Solar Energy
(एक स्वायत्त संस्था, नवीन एवं नवीकरणीय ऊर्जा मंत्रालय, भारत सरकार के अधीन)
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File No: SDD-44048/1/2020-SDD

Date: 8th January, 2021

Sub: Expression of Interest (EOI) of Varunmitra Skill Development Program for FY 2020-21.

NISE is issuing an Expression of Interest to empanel the Training Partners to impart Varunmitra skill development program in FY 2020-21.

The online portal for submitting the application will be activating from 12th January, 2021 at NISE's Website (www.nise.res.in) till the last date of submission i.e. 28th January, 2021.

Sharma
08/01/2021

(Dr. Vikrant Sharma)
Dy. Director, NISE

Invitation For Expression of Interest From Govt. Institutes/ Universities/ Engineering/ Polytechnic/ ITI Colleges/ PMKK Centres/ Skill Development Centres as Training Partners for Imparting "VARUNMITRA SKILL DEVELOPMENT PROGRAMME" in FY 2020-21

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1. Background

1.1 Introduction

The 'Solar Photovoltaic Water Pumping Systems' is one of the most useful and popular application of Solar Energy for meeting the irrigation needs. Govt. of India is formulating many schemes to support the Solar Water Pumps for the farmers. It aims to incentivize farmers to run solar farm water pumps and use barren land for generating solar power to have extra income.

Installation of such a large number of 'Solar Pumps' would necessarily need 'Trained and Skilled' manpower for installation/ commissioning as well as for repair/ maintenance. To fulfil this need, NISE is organizing a specialised 'Training Programs on Solar Water Pumping Systems' on 'PAN India' basis to impart the knowledge and guidance in design, installation, commissioning, safety, and operation & maintenance of the solar water pumping systems. The aim is to create a 'Pool of Trained and Skilled Workforce', who will be called as 'VARUNMITRAS'.

In the past NISE has conducted twenty-six similar programs on Solar Water Pumping systems (Called as Varun Mitra Programme) which have been appreciated and the demands have been invited for organizing further trainings. The participants in these 'Training Programs' were from different States (Rajasthan, Uttar Pradesh, Assam, Delhi, Haryana, Madhya Pradesh, Mizoram, Punjab, Tamil Nadu, Maharashtra Bihar/ Jharkhand, Andhra Pradesh/ Telangana and Gujarat).

The Ministry of New & Renewable Energy, Government of India, vide letter no. 32-11/2/2018-HRD dated 25.05.2018 sanctioned NISE to conduct the Solar Water Pumping Program across the country. The goal of this training Program is to create trained manpower for the installation, operation, and maintenance of the Solar Water Pumping Systems. In this regard, NISE launched a 21-days / 120 hrs Solar Water Pumping Programme titled 'Varunmitra' to impart comprehensive training to about 400 participants during the FY 2018-19. As per the proposal of, NISE organized these training programs through the government institutes.

The 20 batches in 13 States have been conducted and completed successfully creating 425 Varunmitras. Thus, the given target of 400 students has been successfully achieved, and exceeded as a total number

1.2 About Varunmitra Skill Development Program (VSDP)

VSDP aims to develop the skills of youth, considering the opportunities for employment in the growing Solar Water Pumping Project's installation, operation & maintenance in India and abroad. The VSDP is also designed to prepare the candidates to become new entrepreneurs in Solar Water Pumping sector. This is 3 weeks/ 21 days / 120 Hrs. residential skill development program following the Qualification Pack of Skill Council Green Jobs [SCG/Q0112 (SGJ/N0134)].

Target Participants: The target participants are Solar Entrepreneurs, Public Sector Undertaking officials, EPC Contractors, State Nodal Officers (SNA), Manufactures, etc.

Qualification: As per qualification of SCG/Q0112 (SGJ/N0134), the candidates should have Diploma and Degree in Electrical/Electronics/Civil/Mechanical.

Number of Participants: 30 Participants in a batch.

The candidates would be provided boarding and lodging facilities at the training centre by the training partner (TP). At the end of the course, proper assessment shall be made, and certificates shall be issued by a third party assigned by NISE. Any change in assessing body shall be informed by NISE to the concern TP.

NISE reserves the right to modify/change the EOI schedule. Any query to this EOI will be responded through e-mail **varunmitra.nise@nise.res.in** in according to the scheduled date and time as per point no 2. NISE in its absolute discretion without being under any obligation to do so, could update, amend or cancel the Expression of Interest (EOI) without specifying the reason.

2. Guidelines for application:

The applicant has to submit its application in online mode through web portal and a copy of all the supporting documents along with the application receipt received through applicant's email id need to send in a hard copy separately to NISE. The online portal will be activating from **12th January, 2021** till last date of submission at NISE's website, www.nise.res.in

The last date to submit the online application is 28th January, 2021

2.1 Scope of work

NISE invites response document to this Expression of Interest for the selection of Training Partner (TP) to implement Varunmitra Programme on PAN India basis during 2020-21.

2.2 Eligibility Criteria for Training Partner (TP)

The categories of the Training Partners are as follows:

(i) The TP must be a Government Institution/ Engineering College/ Polytechnic College/ ITI/ Pradhan Mantri Kaushal Kendra (PMKK) or any other affiliated skill development centre with proper infrastructure. The order of selection preference will be as follows:
   - Government Institutes/Universities (Central/State/Deemed to be University/ Private University recognized by UGC)
   - Engineering College (Central/State/Private College approved by AICTE) Polytechnic (both private and government approved by designated state authority)/ ITI College (both private and government approved by NCVT/SCVT)
   - PMKK Centre
   - Other Skill Development Centre

(ii) The TP must have Faculty with proper knowledge of Solar Water Pumping/ Solar Energy Programmes. To support this, a CV with relevant documents for each faculty must be submitted. The same requirements are applicable to guest faculty, if any.

(iii) TP must have well equipped laboratory, classroom facilities and residential facilities (Photos must be enclosed). A List of necessary equipment/tool is given in **Annexure 3.**

Table 1: Technical Response Scoring Criteria – 70 marks**

S. No.	Evaluation Criteria / Weightage	Maximum marks	Proof / Documents required
A.	**Technical Capability**		
I	**Training Centre infrastructure facility**		
a	**Training Centre including classroom, labs etc.** **(i) Owned by the applicant (10 marks)**	**10**	Ownership document
	(ii) Rented/Lease (within the academic institutes) (08 marks)		Valid rental/ lease deed
b	**Hostel facility** **(i) within the campus (08 marks)**	**8**	Gio-tag image of hostel clearly showing the centre and hostel
	(ii) outside the campus (06 marks)		
c	**Availability of basic solar lab with Solar Water Pumping systems and related equipment**	**12**	Photographs (at least 2 photographs is required with details of the equipment) as mentioned in **point no 5 of "2.4 Infrastructure"**
II	**a) Solar Training Projects undertaken (per centre) with Central/ State Governments/ PSUs in the last 3 year**	**10**	Centre-wise Sanction/ Work Orders and completion certificate of the training projects undertaken
	b) Total no of participants trained in Solar Energy in last 3 years	**10**	Certificate singed by CA
III	**The institute must have Solar Water Pumping Facility either in campus or access to such facility nearby**	**10**	Photographs (at least 2) and proper proof has to be

			submitted in case of nearby facility
IV	**No of qualified faculty per centre**	**10**	CV with relevant documents
	TOTAL	**70**	

** The selection criteria will be followed based on the points mentioned in the above table. NISE decision in this regard will be final and no request for re-consideration will be entertain.

2.3 Selection Process

(a) NISE reserves the right to decide the number of shortlisted TPs from the merit list.
(b) If required, the number of shortlisted TPs may be increased, based on the requirement of the Varunmitra project.
(c) A Letter of Empanelment to the shortlisted TP shall be issued.

2.4 Infrastructure

1. A Classroom to accommodate 30 participants (**capacity of 60 seaters to ensure social distancing**) with basic teaching aids- white board, table 6'x3' and sitting arrangement with audio & video facilities. It should as per the guidelines issued by M/O Health & Family welfare, Government of India.
2. The Institute must have necessary arrangements to ensure social distancing between the students as per the COVID-19 guidelines.
3. Institute should have hostel facility to accommodate 30 participants per batch with separate arrangements for boys' and girls' participants. It should as per the guidelines issued by M/O Health & Family welfare, Government of India.
4. Canteen facility with daily breakfast, lunch, dinner with two times tea for the participants. The dining area and food should by hygienic; weekly menu should be fixed which includes seasonal and green vegetables.
5. The institute must have following Solar Water Pumping Facility either in campus or access to such facility nearby for the practical/hands-on experience of the participants:

Sr. No	**Item**	**Type**
1.	Solar Water Pump & Motor	AC/DC (Submersible & Surface)
2.	PV Module array	As per pump capacity
3.	Pump Controller	As per Pump capacity and types of pump (AC/DC/BLDC)
4.	Wiring	As per Requirement
5.	PV module mounting Structure	With manual Tracking arrangements
6.	Water Source	Bore well/ tank (proper arrangement for submersible or surface pump tests)
7.	Multimeter	1
8.	Clamp meter	1
9	Tool & Safety Kit	As per **Annexure 3**

6. The institute should have apparatus for conducting Basic Electricity Experiments as per the course curriculum. In house Solar Water Pumping Facility must be installed or Access to such facility nearby (for which a proof has to be submitted).

2.5 VSDP Financials and Payment terms:

a) The budget of per batch for 30 participants on pan India Basis (of 3 weeks /120 Hrs each) is as follows: (Cost structure as per X category)

S. No	Item Particulars (@30 participants in each batch)	Total Amount (In Rs)
1	Course Fee for 3weeks/120Hrs - (Mobilization of candidate, Equipment, Infrastructure, Salary of Internal Trainer, Teaching Aid, Trainers' training , venue cost etc.)(46.7*120*30)-As per NSDC Norms	1,68,120.00
2	Boarding & Lodging based on category wise x-Rs 300 per day per participant/y-Rs. 250 per day per participant /z- Rs 200 per day per participant **(As per Annexure 1)**	1,89,000.00
	Training Charges Per Batch Cost	**3,57,120.00**

b) Payment terms

The fund will be released by NISE in two Instalments as per the following details:

i) First Instalment: NISE will release 50% advance at the start of the program as per GFR 2017. The TP shall provide the joining report, copy of adhaar cards, and database of the participants at this stage. The advance will be released against the Bank Guarantee to private institutions.

ii) Second Instalment: The TP may claim for 50% of the total cost at the conclusion of the program. The payment of dropout candidate shall be adjusted in the 2nd instalment. No fund shall be released for dropout and failed participants. The following documents shall be provided within 15 days of conclusion of program:

i. Utilization Certificate in GFR 12A
ii. Statement of Expenditure
iii. Attendance sheet
iv. Copy of Adhaar card of participants
v. Group photo
vi. Certificates of successful participants
vii. Details of participants in the specified format (Adhaar number of participants is mandatory)

The breakup of expenditure out of course fee shall be as follows-
(a) Mobilization of participants
(b) Curriculum
(c) Training of Trainer
(d) Equipment

(e) Amortization of Infrastructure costs/ utilization
(f) Teaching aid
(g) Raw material
(h) Salary of trainers and support staff
(i) Any other expenditure for imparting the training programme

2.6 General Information:

- The supporting documents should be uploaded on portal. The application with incomplete documents/ information shall not be considered.
- Applications of joint venture/ consortium in any form shall not be considered.
- The subletting of training is not allowed and will attract the cancellation of empanelment of TP.
- The applicant has to deposit a Demand Draft of **Rs 5,000/-** as processing fee (non-refundable) in favour of "National Institute of Solar Energy", payable at Gurgaon.
- NISE reserves the right to allocate number of Varunmitra to TP to skill during 2020-21.
- The empanelled TP has to submit details of participants in advance in the following format-

S.No.	Duration	Name of Candidate	Father's Name & Mother's Name	Date of birth	Permanent Address, email id, Mobile No.	Physically Handicapped if any	Category (Gen/SC /ST/OBC)	Aadhar No.	Mobile. No	No. of Days attended / Total no. of days of training)	Grade	Photograph

- Faculty should have the proper knowledge of Solar Water Pumping Programme. The submission of necessary documents must be required in support of these. The External speakers shall be invited for expert lectures.
- Each program should have 30 participants. The assessment and certification will be done by Third Party agency selected by NISE. NISE will release the assessment fee directly to third party. Any revision of fee structure shall be based on MNRE approval, which shall be communicated accordingly.
- Bio-matric attendance System and IP based camera system is mandatory at the training centre.

2.7 Termination

The empanelment of the TP may be terminated at any point of time if any violation of norms is found during the implementation of the Varunmitra programs.

Annexure 1

Categorization of Indian cities for Residential Training Costs

S. No.	State	Cities classified as "X"	Cities classified as "Y"
1.	Andhra Pradesh		Vijayawada [Urban Agglomeration (UA)], Visakhapatnam (UA), Guntur
2.	Assam		Guwahati (UA)
3.	Bihar		Patna (UA)
4.	Chandigarh		Chandigarh
5.	Chhattisgarh		Durg- Bhilai Nagar (UA), Raipur (UA)
6.	Delhi	Delhi NCR (UA)	
7.	Gujarat		Ahmedabad (UA), Rajkot (UA), Jamnagar (UA), Vadodara
8.	Haryana		Faridabad
9.	J & K		Srinagar (UA), Jammu (UA)
10.	Jharkhand		Jamshedpur (UA)
11.	Karnataka	Bengaluru (UA)	Belgaum (UA), Hubli-Dharwar, Mangalore (UA)
12.	Kerala		Kozhikode (UA), Kochi (UA), Thiruvanthapuram (UA)
13.	Madhya Pradesh		Gwalior (UA), Indore (UA), Bhopal (UA), Jabalpur
14.	Maharashtra	Greater Mumbai (UA)	Amravati, Nagpur (UA), Aurangabad (UA), Nasik (UA), Bhiwandi (UA), Pune (UA), Solapur, Kolhapur (UA)
15.	Orissa		Cuttack (UA), Bhubaneswar (UA)
16.	Puducherry		Puducherry (UA)
17.	Punjab		Amritsar (UA), Jalandhar
18.	Rajasthan		Bikaner, Jaipur, Jodhpur (UA), Kota
19.	Tamil Nadu	Chennai	Salem (UA), Tiruppur (UA), Coimbatore (UA), Tiruchirapalli (UA), Madurai (UA),
20.	Telangana	Hyderabad (UA)	Warangal (UA)
21.	Uttar Pradesh		Moradabad, Meerut (UA), Ghaziabad, Aligarh, Agra (UA), Bareilly (UA), Lucknow (UA), Kanpur (UA)
22	Uttarakhand		Dehradun (UA)
23.	West Bengal	Kolkata (UA)	Asansol (UA)

All other cities/towns in various States /UTs which are not covered by classification as "X" or "Y" are classified as "Z".

Annexure 2

INFORMATION ABOUT THE QUALIFICATION PACK AND COURSE CURRICULAM

1.	**Name of the QP**	Solar PV Engineer (Option: Solar Water Pumping System)
2.	**Sector**	Green Jobs
3.	**Reference ID (CODE)**	SCG/Q0112 (SGJ/N0134)

4.	**Qualification**	Diploma (Electrical/Electronics/Civil/Mechanical) or pre-final engineering and technology candidate with 3 years of formal engineering education
5.		Higher qualification is strictly not allowed.
6.	**Age**	20 Years and above not exceeding 40 years
7.	**Terminal Competency**	After completion of Course Trainees may be able to:
		a. Know the basics of Solar Water Pumping Systems
		b. Operate Solar Water Pumping System & Maintain them
		c. Work for execution project
		d. Plan & Install Solar Water Pumping System
		e. Testing and Commissioning of Solar Water Pumping Plant
8.	**Duration**	: 120 hrs
9.	**Contents:**	Required tentative day wise list of faculty to deliver the lecture

Topics as per Qualification Pack of Skill Council Green Jobs (SCG/Q0112(SGJ/N0134)	
DAY-1 (Monday) ***(First half)*** ***Welcome and Orientation***	
DAY-1 (Monday) ***(Second half)*** ***Session 1A:***	
Solar Energy Fundamentals	**Basics of Solar Energy** • Insolation • solar resource assessment • Direct normal irradiation • Diffuse horizontal irradiation • Global horizontal irradiation and • Albedo effect • Solar Path • Angles (azimuthal, hour, altitude, zenith etc.)
DAY-2 (Tuesday) ***Session 1 B:***	

Solar Energy Fundamentals	**Introduction to Solar Water Pumping System** • Pump • Motor (AC/DC and Submersible/Surface) • Solar Panels / Modules • Controller • Structure • Remote Monitoring System • Applications ***Practical*** *Working and construction of basic radiation measuring instrument:* • *Pyranometer,* • *Pyrheliometer,* • *Pyregeometer* • *Calculating azimuthal angle* *Calculating orientation of solar panels*
DAY-3 (Wednesday) ***Session 2 A:***	
Solar Water Pumping Systems Technology	**Surface and Submersible Pumps** • Surface Pumps • Submersible Pumps • AC Motor • DC Motor ***Practical Training*** *Working and explanation of pumps*
DAY-4 (Thursday) ***Session 2 B:***	
Solar Water Pumping Systems Technology	**Solar Pump System Terminologies and Characteristics** • Suction Head • Delivery Head • Static Head

	• Dynamic Head • Friction Losses • Effect of Tilt / Shading / Tracking • PV and IV Characteristics of Solar Water Pumps • Choice of Solar Water Pumping System **Practical Training** • **Case Study** on choice of Solar Water Pumping System • Calculation of heads and Losses • Shadow Analysis
Day-5 (Friday) **Session 2 C:**	
Solar Water Pumping Systems Technology	**Understanding of B.O.S. Components** • Controller (PWM and MPPT) • Inverter / VFD • Mounting Structure • Manual / Auto Tracking • Various type of tracking system and their usage • Remote Monitoring System (RMS) • Series and Parallel Connection of Solar Panels ***Practical Training*** • Working and field experience of BOS Components • Field Practice of Series and Parallel Connections
DAY-6 (Saturday)	***Free***
Day-7 (Sunday)	***Free***
Day-8 (Monday) ***Session 3:***	
	Designing of Solar Water Pumping System • AutoCAD • PV*SYST

	• PV*SOL® **Practical Training** • AutoCAD • PV*SYST • PV*SOL®
Day-9 (Tuesday) **Session 4:**	
System Integration	**Site Selection** • Site handling • Analysis of water usage and level of water table at site • Crop water requirement • Availability of water and recharging frequency of water • Important Site Considerations • Water Source **Practical Training** Drip/ Micro Irrigation
Day – 10 (Wednesday) **Session 5:**	
Installation / Commissioning	**Bore Well/ Open Well / Stream** **Installation Procedure** • Oversee the preparation of the foundation for solar module mounting structure and motor pump set • Design the plan of mounting structures and foundation • Ensure structure is fixed on the foundations • Mounting of solar modules • Oversee the connection of solar module array to pump set in case of DC pumps

	• Oversee the installation of inverter in case of AC pumps • Ensure protection system are in place • Perform inspection and testing of equipment • Perform start-up procedures and measure output • Compare the output with design output and take corrective actions, if required • Ensure connection of the solar module array to motor pump set through a Maximum Power Point Tracker (MPPT) to get maximum power from the array ***Practical Training***
Day-11 (Thursday) **Session 6:**	
MNRE Guidelines	• Performance Specifications • Standards and guidelines • Warrantee Clause • Overview of MNRE Policies
Testing of Solar PV Water Pumping System	• Solar Pump Testing • Measurement of Efficiency • Quality Management ***Practical Training*** • Case Study
Day-12 (Friday) **Session 7:**	
Documentation	• JNNSM • KUSUM • Solar Policies of States • Subsidy • Loan Schemes • Liaising

	• Commissioning **Practical Training** • Case Study
Day 13 (Saturday)	**Free**
Day 14 (Sunday)	**Free**
DAY-15 (Monday) ***Session 8 A:***	
Operation & Maintenance	**Operation and Maintenance** • Proper Operation procedure • Maintenance of Solar Water Pump System • Preventive Maintenance • Safety Practices ***Practical Training*** • To be competent, the user/individual on the job must be able to operate the solar water pump • ensure periodical cleaning of solar module array • periodically ensure tightness of cable connections • ensure periodic maintenance of motor pump set
DAY-16 (Tuesday) ***Session 8 B:***	
Operation & Maintenance	• Trouble shooting • Do's and Don'ts ***Practical Training***
DAY-17 (Wednesday) ***Session 9 A:*** ***(First Half)***	
Business Models	• System's Viability • Stand Alone and Centralized Solar Pumping Systems • Financial Analysis & Customer's needs

Day-17 (Wednesday) **Session 9 B:** ***(Second Half)***	
Business Aspects	Start-ups
Day-18 (Thursday) **Session 10:**	
Skills Development	• *Core Skills* • *Generic Skills* • *Soft Skills* • *Negotiation Skills* • *Feedback*
DAY-19 (Friday)	
Conclusion	Assessment and Certification
Day 20 (Saturday)	***Free***
Day 21 (Sunday)	***Free***

Annexure 3

List of Tools & Equipment for a batch of 30 trainees:

The institute should have Varunmitra labs fully equipped with all kind of tools & tackles and instrumentation along with equipment and apparatus for conducting Basic Electricity Experimentation with the course curriculum.

Sr. No.	Name of Tools & Instruments	Quantity (Nos.)
1.	Tool kit	As per requirements
2.	Double ended flat spanner	2 set
3.	Double ended ring spanner	2 set
4.	Combination pliers	4
5.	Side cutting pliers	4
6.	Nose pliers	4
7.	Wire stripper	4
8.	Electrician knife	10
9.	Hack saw frame with blade	4
10.	Hand crimping tools	2

11.	Cable cutter	1
12.	Screw driver	4
13.	Water level	5
14.	Measuring tape	1
15.	Centre punch	1
16.	Standard wire gauge	1
17.	Vanier caliper	1
18.	Line dori	2
19.	Drill m/c	2
20.	Plumb bob	2
21.	Sprit level	2
22.	Ball pin hammer	4
23.	Fuse puller	1
24.	Tong tester AC/DC	2
25.	Multimeter	2
26.	Megger	2
27.	Earth tester	2
28.	Water testing instrument (TDS meter)	1
29.	Earthing Rod	1
30.	Soldering Iron & Flux	5
31.	Phase Sequence Meter	2
32.	Pyranometer	1
33.	Tacho meter	1
34.	Compass	1

Demo Equipment

Sr. No.	Name of Tool & Instrument
1.	Tool kit
2.	Double ended ring spanner
3.	Combination pliers
4.	Side cutting pliers
5.	Nose pliers
6.	Wire stripper
7.	Electrician knife
8.	Hack saw frame with blade
9.	Hand crimping tools
10.	Cable cutter
11.	Screw driver
12.	Water level
13.	Measuring tape
14.	Centre punch
15.	Standard wire gauge
16.	Vanier calipash
17.	Line dori
18.	Chisel
19.	Drill m/c
20.	Plumb bob
21.	Sprit level
22.	Flat file

23.	Round file
24.	Triangle file
25.	Hand saw
26.	Pvc mallet
27.	Ball pin hammer
28.	Fuse puller
29.	Megger
30.	End termination of power cable
31.	Cable tray Erection
32.	Structure with module mounting

Safety & Protective Equipment

Sr. No.	**Name of Tools & instruments**	**Quantity (Nos.)**
1.	Safety helmet	As per requirement
2.	Safety souse	As per requirement
3.	Safety belt	As per requirement
4.	Nose mask	As per requirement
5.	Safety goggles	As per requirement
6.	Ear plug	As per requirement
7.	PVC hand glove	As per requirement
8.	Cotton hand glove	As per requirement
9.	Reflective jacket	As per requirement
10.	First aid kit	As per requirement
11.	Electrical Safety boots	As per requirement

Note: Any part or whole content and curriculum may be changes/ updated at any point of time based on the industry requirement under the directions of MNRE/NISE.