



# The evolving energy sector jobs and recruitment challenges

## New Jobs New People

Session 3

3<sup>rd</sup> WePOWER Regional  
Conference

Bangkok, Thailand (Dec 6-8, 2022)





# Reflections from 30 years in the Infrastructure Sector

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Dr. Masood Ahmed,  
Retired Lead Water  
Resources Specialist,  
World Bank

# 1. In Karakapastan Autonomous Region of Uzbekistan, a Drainage Project. In the background an electric walking excavator with 11 meters bucket.



## 2. Feraghana Valley area

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### 3. Northern Aral Sea Project spillway structure under construction in Kazakhstan

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## 4. Aitek Structure on Syr Draya in Kyzl Orda Kazakhstan old and replaced under the Project

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# 5. Padma Bridge Project, Bangladesh



## 6. Farm Water management Project in Sarghoda Pakistan

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# 7. Tarbela dam project in Pakistan

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# 8. Dasu HPP in Pakistan

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# 11. Mangala dam project, behind is water jet from the power house

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**SKILL COUNCIL FOR GREEN JOBS**

# **Strategic Planning for new skills and jobs: developing trainings and standards – what will future Energy Jobs look like?**

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Mr. Deepak Rai, Head -  
Standards and Research, India  
Skills Council for Green Jobs

# About Skill Council for Green Jobs (SCGJ)

Set up in 2015 as a sector skill council by the Ministry of Skill Development and Entrepreneurship (MSDE) and the Confederation of Indian Industry (CII) to catalyse growth in green business through skilling and entrepreneurship development

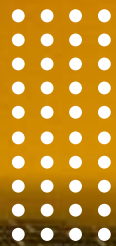
Now recognised as an Awarding Body by the regulator- National Council for Vocational Education and Training (NCVET) and implements Skill India Mission

- Skilling interventions are aligned with leading schemes and missions of the Government of India while building partnership with stakeholders from industry, vocational institutions, academia and communities.
- Trained and certified over 526,000 trainees till date (mainly in waste management and renewables mainly solar energy) and aims to further train and certify up to 3 Million trainees by 2030, with at least 30% female candidates.
- **The skill strategy is complemented by specific efforts to promote entrepreneurship as well**

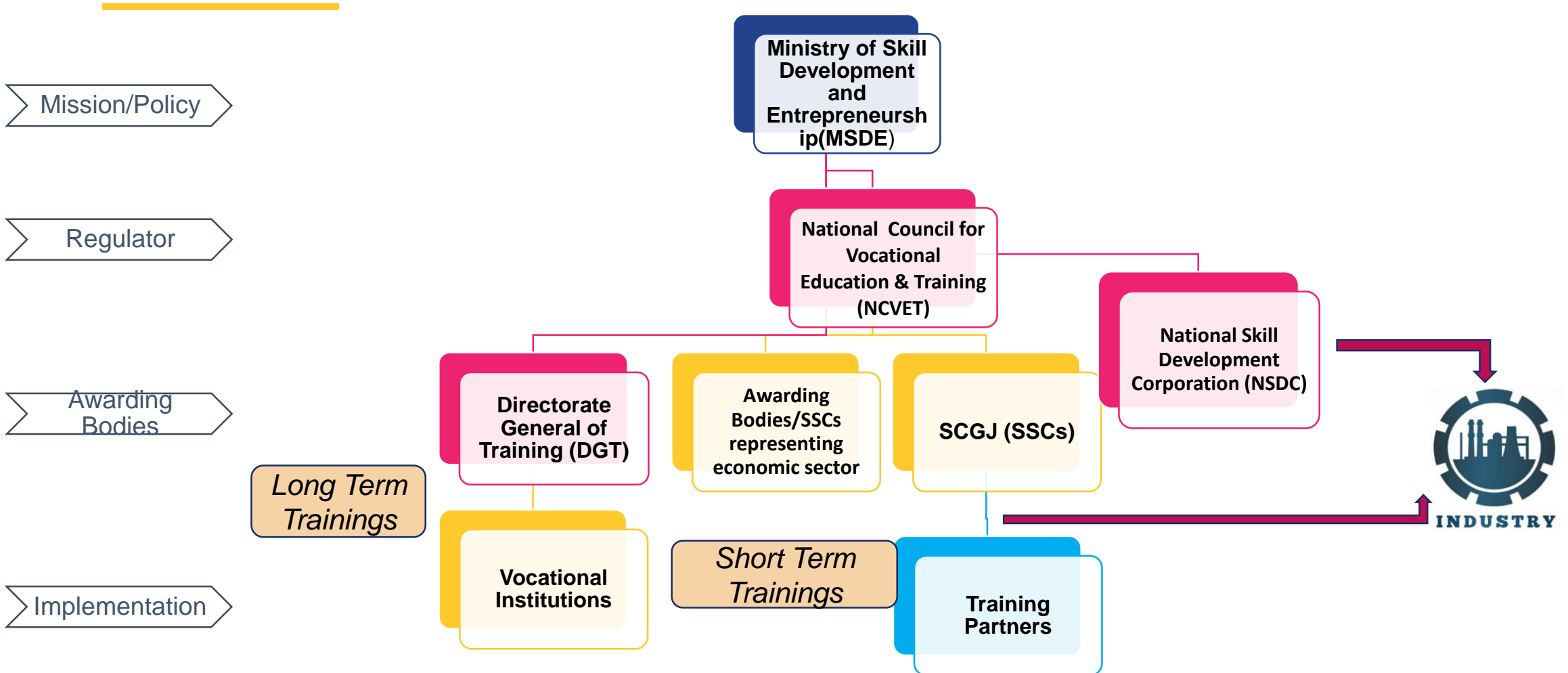


India can potentially create about 3.4 million jobs (short and long term) by installing 238 GW solar and 101 GW new wind capacity to achieve the 500 GW non-fossil electricity generation capacity by 2030 goal.

India to create an estimated 30-35 million additional jobs across Green Business by 2047



# Skill Ecosystem in India



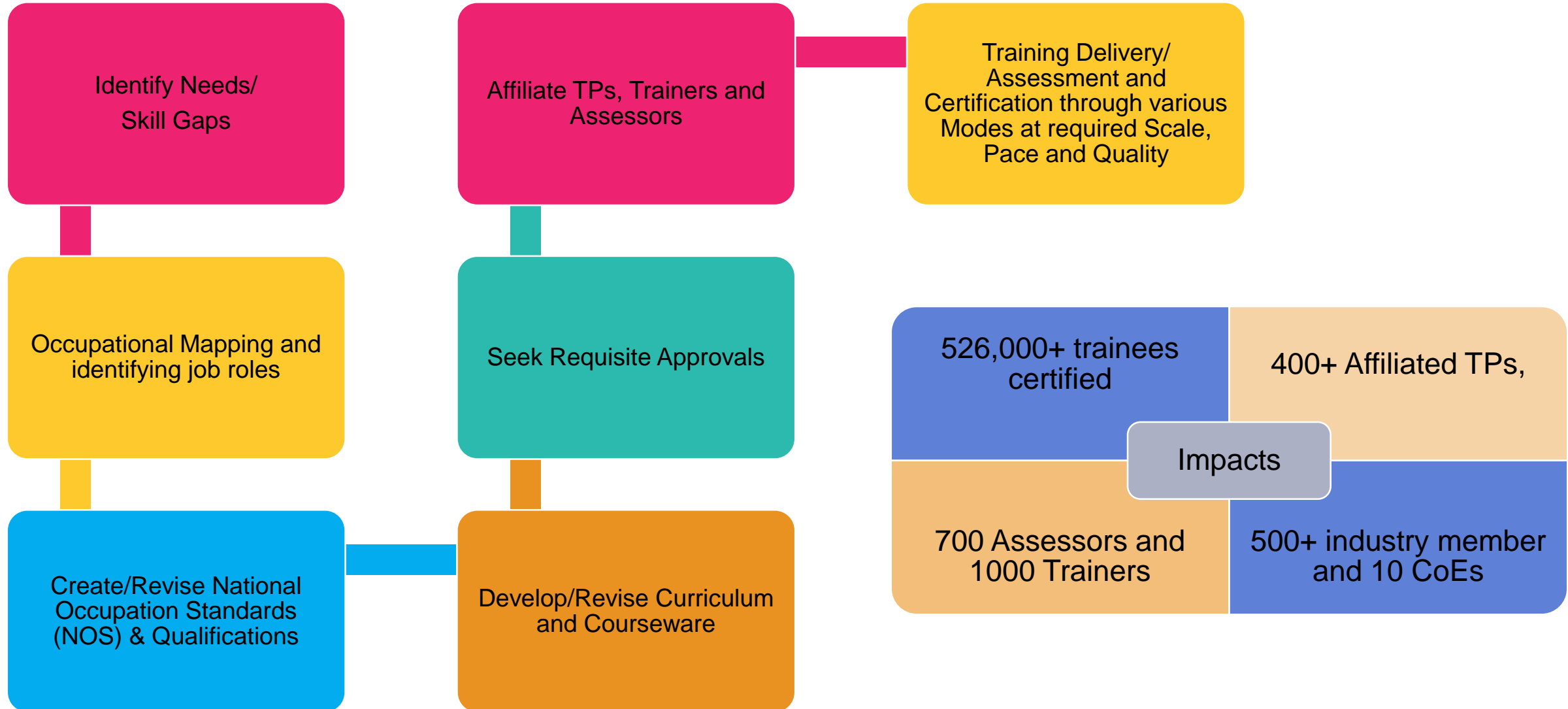
**SSCs/ABs are Industry lead bodies** set up for the purpose of developing sector-specific competencies, quality assurance through accreditation of trainers, assessors and training partners along with curriculum development, setting of standards and benchmarks, imparting trainings, certifications and placement of certified trainees, etc.

## Snapshot of Thematic Job Roles

Sector-wise Job Roles	NSQC approved Job Levels						
	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	
Solar Photovoltaic	1	0	9	6	1	2	19
Wind Energy	0	1	3	2	0	0	6
Bioenergy	0	1	3	1	1	1	7
Waste Management	0	2	1	0	1	0	4
Waste Water Treatment	0	1	3	0	0	0	5
Clean Cooking	0	1	2	1	0	0	4
Others	0	2	3	0	0	0	5
<b>Total</b>	<b>1</b>	<b>8</b>	<b>24</b>	<b>10</b>	<b>3</b>	<b>3</b>	<b>50</b>

*Project emerging skills needs and coordinate matching demand and supply of skilled workforce*

# Snapshot of Skill Delivery cycle







**Hon'ble Prime Minister**

**Shri. Narendra Modi**

on 15<sup>th</sup> August 2021



*Make India energy independent  
before the completion of **100 years**  
of independence (Year 2047).*

India is also emphasizing on Clean Energy Transition  
and **Circular Economy** creating **new opportunities**  
for **Green Growth** and **Green Jobs**

**India's pathway to  
combat climate change  
PANCHAMITRA at COP  
26, Glasgow**

India's five-point climate action plan, is set to give a firm push to its plans for an accelerated transition to a low carbon economy.

- Achieve the target of net-zero by 2070
- Non-fossil energy capacity to reach 500 GW by 2030
- 50% of energy requirements to be met through RE by 2030
- Emissions intensity of GDP to be reduced by 45% by 2030
- Reduce 1 Billion tonne of Carbon Emissions by 2030

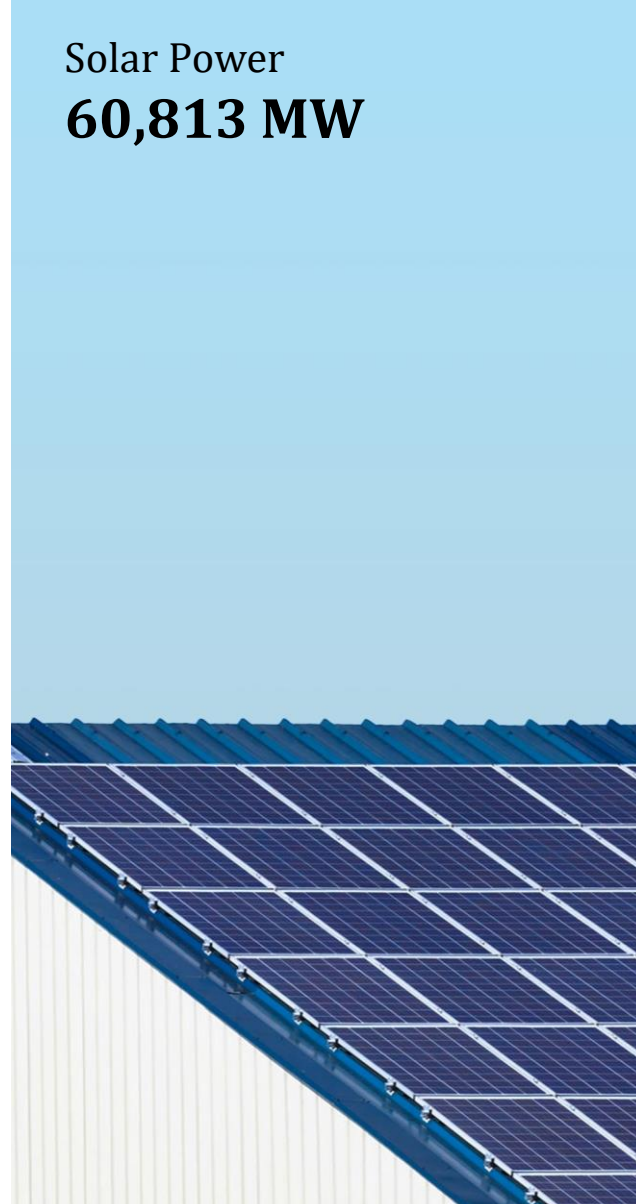
**Hon'ble Prime Minister  
Shri. Narendra Modi  
at COP 26 (Nov 2021)**



Wind Power  
**41,666 MW**



Solar Power  
**60,813 MW**



Small Hydro Power  
**4,899 MW**



Bio-Power  
**10,977 MW**



## Renewable Energy Sector Indian Scenario



Wind Power  
**41666 MW**

Waste to  
Power  
**223.14 MW**

Solar Power - Ground  
Mounted  
**49853 MW**

Waste to Energy(off-grid)  
**272 MW**

Solar Power - Roof Top  
**7520 MW**

Biomass (Bagasse)  
Cogeneration  
**9433.56**

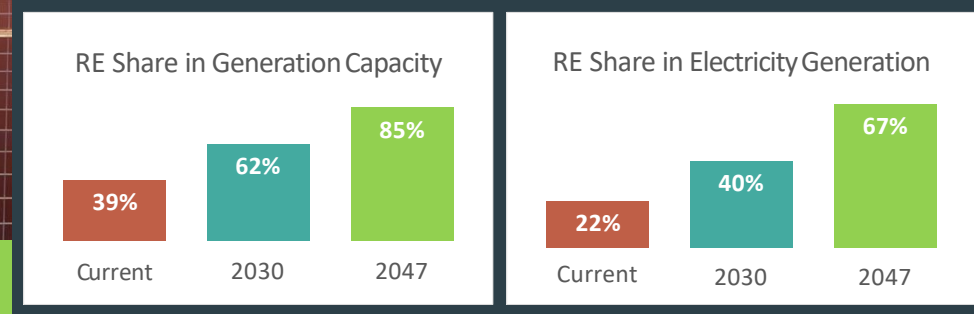
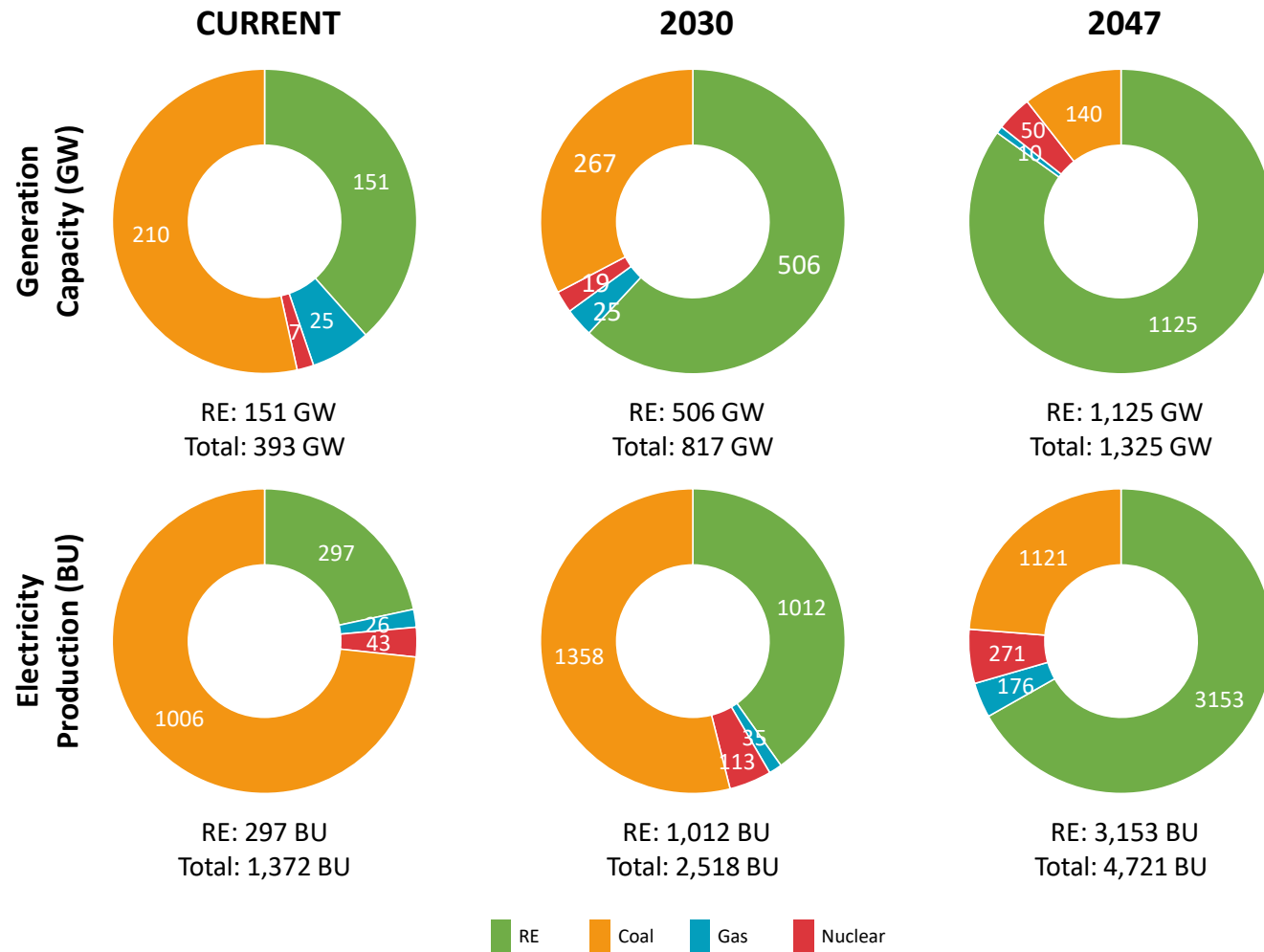
SPV Systems (Off-  
grid)  
**2059 MW**

Biomass (non-bagasse)  
Cogeneration  
**772.05 MW**

Small Hydro Power  
**4899 MW**

Source: MNRE, Programme/Scheme wise Cumulative Physical Progress  
as on Sep, 2022 | <https://mnre.gov.in/the-ministry/physical-progress>





# Indian Energy Sector 2022- 2047



Source: MNRE Vision 2047 (CEA Optimal Energy Mix Report (Jan. 2020), NITI Aayog - India Energy Outlook, 2021)

# Government of India Goals & Plan

## RE Sector Key Goals for India - 2047

-  Energy Independence and Security
-  Enhancing Decarbonization of the Energy Sector
-  Self sufficiency in manufacturing of RE Technologies
-  Global hub for Green Hydrogen Production and Exports

## Programmatic Interventions

- 01 National Green Hydrogen Mission
- 02 Interventions to promote Domestic Manufacturing like PLI
- 03 Innovative Market Mechanisms for RE
- 04 Policies & Regulations to promote decarbonization and circularity across value chains
- 05 Scaling up programmes for Off-shore wind, waste to energy, DRE, farmers (KUSUM), rooftop solarization
- 06 Strategic bilateral and multilateral partnerships on technology, finance, trade
- 07 Measures to build supply chains for critical materials and components
- 08 Strengthening institutional capacity and industrial competitiveness

## Key Renewable Energy Sectoral Strengths

Leading to future job opportunities



### Abundant RE Potential

Solar: 750 GW, Wind: 695 GW,  
Bio-energy: 42 GW, Waste-to-Energy: 5.65 GW



### Strong Policy Backing

For Renewables  
Electricity Act, NDCs, State Policies



### Robust Grid Infrastructure

One Nation-One Grid,  
Green Energy Corridors



### Ability to attract Domestic & International capital

Through proven, sustainable  
and profitable business models



### State-of-the-art Manufacturing Ecosystem

Available for Wind,  
Upcoming for Solar



### Strong Institutional Framework

Dedicated Ministry, Regulatory Bodies  
and RE Implementing Agencies



### Counter-Party Framework

For contracts,  
Payment security



### Rich experience

In skillsets and capability building, regulations,  
project development, and financing

# New Skills and Jobs Opportunities in Emerging Sectors








# Future sectors with high Job potential in Green Business

- 01 E Mobility/Green Transportation
- 02 Solar manufacturing
- 03 Energy Storage
- 04 Green Hydrogen
- 05 Wind-Solar Hybrid and other Renewable Energy Systems
- 06 Off Shore Wind Power Plants
- 07 Biomass based power generation /Biofuels/ Bio CNG Production and Supply Chain
- 08 Pollution Prevention and Control Network
- 09 E-waste Management
- 10 Decarbonization of Energy intensive Sectors/
- 11 Green Buildings
- 12 Green Financing

## Key existing and emerging thematic areas for accelerating jobs creation



	Renewable Power Generation		Green Hydrogen		Make in India for the world
	Energy Storage		EV value chain		





# WorldSkills 2022





# Preparing Workforce for the Future Jobs



- Align with industry on skill requirement, trainings, jobs and workforce transition pathways
- Ensure integration of on Job Training/Apprenticeship



- Partner with industry and academia to create Trainers/Experts Pool
- Co-create training and accreditation programs



Enable upskilling and transition of existing Workforce in Fossil fuel based sectors to Green Sectors



Demonstrate scalability of industry supported and other market mode based skill interventions



- Integrate gender perspectives in training and capacity building efforts
- Build a network of certified women trainees and entrepreneurs to establish cross learning



Establish skilling capacity & support infrastructure within Training Partners, Vocational Institutions and now schools and Institutions of Higher Learning



Map supply and demand centers and enable quality skilling on key job roles at required scale and pace

Recalibration of skilling policy and strategies: To deliver skills for Net Zero green economy,

Government(s), employers, training providers, awarding bodies, vocational and academic institutions, urgently need to collaborate to get us where we need to.

# Technical and Employability Skills

The speed of skills transition for a net zero green economy will be determined by the investment and focus from industry, Government along with education and vocational counterparts

## Skills required in medium- to high-skilled occupations

- STEM Skills
- Sector Specialized skills
- Digitalisation and AI
- Information and communications technologies (ICT)
- Analytical and Problem solving
- Management and Business skills
- Innovation and Entrepreneurial skills
- Consulting and Project management
- Marketing Skills
- Financial, Legal and contract management
- Networking and language Skills
- Strategic and leadership skills

## Skills Required across the workforce

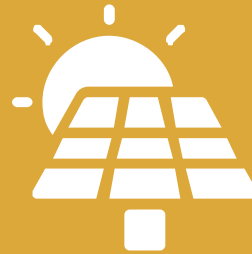
- Entrepreneurial skills
- Occupational Health and safety
- Adaptability and transferability skills
- Communication and other soft skills
- Team work skills
- Digital and financial literacy



Selected NSQC approved Qualifications in  
Green Business

Qualifications (Skill Course)

# Solar Energy



1

## Solar PV Installer (Suryamitra) SGJ/Q0101 v2.0

NQR Code: [2021/EHW/SCGJ/04257](https://www.scgj.gov.in/2021/EHW/SCGJ/04257)

### DESCRIPTION

The Learner will be able to check, configure, install, inspect, test, and commission different components of photovoltaic systems, that meet the performance and reliability needs of customers by incorporating quality craftsmanship and complying with all applicable codes, standards, and safety requirements.

### Overview of QP

NSQF Level: 4

Course Duration/Training Hours: 300

**Trainee Qualification:** 10th pass + ITI / Diploma ( Electrical, Electronics, Civil, Mechanical, Fitter, Instrumentation/Welder)

**Entry Age (Years):** Minimum age: 18

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2

## Solar PV Installer – Electrical SGJ/Q0102 v2.0

NQR Code: [2021/EHW/SCGJ/04258](https://www.scgj.gov.in/2021/EHW/SCGJ/04258)

### DESCRIPTION

The Learner will install, test, and commission different electrical components of photovoltaic systems, that meet the performance and reliability needs of customers by incorporating quality craftsmanship and complying with all applicable codes, standards and safety requirements.

### Overview of QP

NSQF Level: 4

Course Duration/Training Hours: 220

**Trainee Qualification:** 10th + I.T.I (Electrical and Electronics)/Diploma (Electrical, Electronics) OR 10thpass+3 years of experience as Electrician

**Entry Age (Years):** Minimum age: 18

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# Qualifications (Skill Course)

# Waste Management



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## Recyclable Waste Collector and Segregator SGJ/Q6101 v2.0

NQR Code: [2021/WSSWM/SCGJ/04271](https://www.scgj.gov.in/2021/WSSWM/SCGJ/04271)

### DESCRIPTION

The Learner would be able to properly collect, identify different types of waste and segregate at source or at collection center as per recycling / reuse / disposal requirement. S/he also ensure health and safety at the workplace. As an entrepreneur S/he would be able to venture into entrepreneurship for recyclable waste collection.

### Overview of Qualification

**NSQF Level: 4**

**Course Duration/Training Hours: 160**

**Trainee Qualification:** Ability to read and write

**Entry Age (Years):** Minimum age: 16

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## Safai Karamchari SGJ/Q6102 v2.0

NQR Code: [2021/WSSWM/SCGJ/04272](https://www.scgj.gov.in/2021/WSSWM/SCGJ/04272)

### DESCRIPTION

The Learner would be able to sweep with a broom and / or other suitable equipment to remove dust, debris and garbage. In buildings, s/he will be able to sweep the floor, scrub the floor using appropriate cleaning solution to remove the fine dust. As an elective for wet cleaning, S/he would specialize in wet cleaning, cleaning and washing bathrooms, lavatory and removing garbage and other waste in closed dustbin. As an elective for mechanized cleaning, S/he will specialize in mechanized cleaning sweeps, cleaning and removing garbage with the help of vacuum cleaner, mechanical sweeper, mechanical sweeper ride and mechanized

### Overview of Qualification

**NSQF Level: 3**

**Course Duration/Training Hours:** 200 (Elective:40/40)

**Trainee Qualification:** Ability to read and write








**Entry Age (Years):** Minimum age: 18

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# Thank You!



 [www.sscgj.in](http://www.sscgj.in) |  [info@sscgj.in](mailto:info@sscgj.in) |  011 4179 2866 | Follow us on    

## Group Discussion Question 1 (5 minutes)

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- Identify 3 top key technical skills that are required for future careers in the energy sector?



Go to [www.menti.com](https://www.menti.com) and use the code 78 48 03 0

Identify 3 top key technical skills that are required for future careers in the energy sector.

 Mentimeter





## Group Discussion Question 2 (5 minutes)

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- Identify 3 top soft skills required for a successful career?



Go to [www.menti.com](https://www.menti.com) and use the code 78 48 03 0

Identify 3 top soft skills required for a successful career.

 Mentimeter



## Group Discussion Question 3 (5 minutes)

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- Identify 3 key job areas/profiles you expect to hire in the near future where you need qualified candidates?



Go to [www.menti.com](https://www.menti.com) and use the code 78 48 03 0

Identify 3 key job areas/profiles you expect to hire in the near future where you need qualified candidates.

 Mentimeter





National Power Training Institute

(A National Apex Body for Training in Power Sector)  
Established vide The Gazette of India-July 3, 1993  
(An ISO 9001:2015 & ISO 14001:2015 Organization)

Ministry of Power, Government of India

# Implementing training for new skills and jobs: How is NPTI training the workforce for the future? Especially women?

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Dr. Tripta Thakur

Director General

National Power Training Institute

# National Power Training Institute (NPTI)

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- National Power Training Institute (NPTI) has been set up by Government of India to function as the National Apex Body for the Human Resources Development of Power Sector personnel in India.
- NPTI has been providing its dedicated service for more than five (5) decades.
- NPTI has trained over 3,80,000 power professionals in its regular programs over the past five decades.
- NPTI operates through its Eleven (11) Institutes in the different power zones of the country on an all India basis.

# *NPTI – An All India Organisation*



Badarpur



Nagpur



Durgapur



Nangal



Faridabad



Guwahati



HLTC Bengaluru



Neyveli



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PSTI Bengaluru

# Two New Institutes



**NPTI Shivpuri**



**NPTI Alappuzha**



# Industry Interfaced Programs



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- NPTI conducts several long-term, medium-term & short-term Training Programs for Engineers & Supervisors on various technical and managerial topics in the areas of Thermal, Hydro, Renewable, Transmission & Distribution, Management, Regulatory Affairs etc. pertaining to power sector.
  - Customized training programs for various Power Utilities are also organized round the year along with Workshops and Seminars on latest developments in the Sector.



# On - Job Training

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- On-job training is an essential supplement to formal training which provides the trainees an understanding of the functions through involvement with real work situations. NPTI conducts on-job training programs as per clients requirements.
- Online Training Course NPTI is conducting online training programs on various topics like Smart Grid and Smart Metering, SPV, Cyber Security etc.

# On-Job Training



# Important Achievements



NPTI has been given a mandate for :-

- **Training & Certification in the area of Cyber Security- Providing Certification.**
- **Capacity Building Under Revamped Distribution Sector Scheme-** Till date NPTI has conducted 51 Nos. of Programs and 1903 personnel have been trained from various Utilities.
- **Training & Certification of Load Dispatch Personnel -** Till date in Basic level Certification Exam 2501 personnel appeared and 2027 Qualified, in Specialist level 671 Personnel appeared and 409 Qualified.

# Linemen Training Programs



NPTI has trained around 2500 Distribution Linemen under “Urja Sarathi”, “Uttam Urja Sarathi” and TF Engineers Training Programs.



# Hot Line Training Centre



**Demonstration of 400 kV live line insulator washing of Kalwa Sub – Station of Maha Transco Ltd., Mumbai.**

# Live line Maintenance



# Skill Development Training

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- NPTI has been empanelled as a Government agency with Ministry of Rural development (MoRD) for conducting NSQF aligned training programs on all India basis for Power Sector & Renewable Energy Sector.
- NPTI has been recognized as an Assessment & Certification body for 60 Qualifications in Power Sector and Renewable Energy Sector.



# ITEC Programme, Ministry of External Affairs, Govt. of India

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- NPTI is conducting training programs through ITEC, MEA, Govt. of India for the countries of the world i.e. SAARC, African Countries etc.

# Technical and Management Training Program for the PIU Staff, Kaduna State, Nigeria

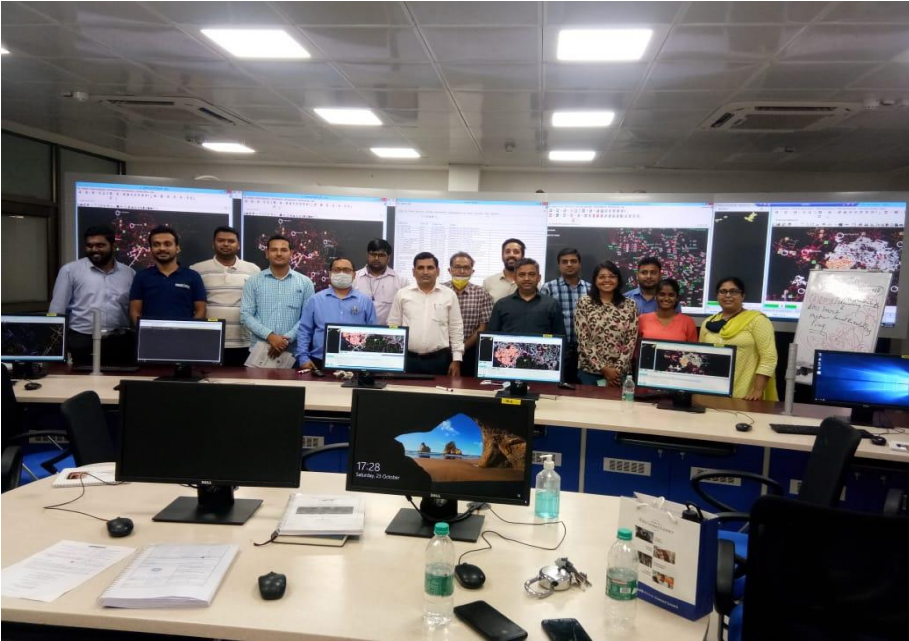
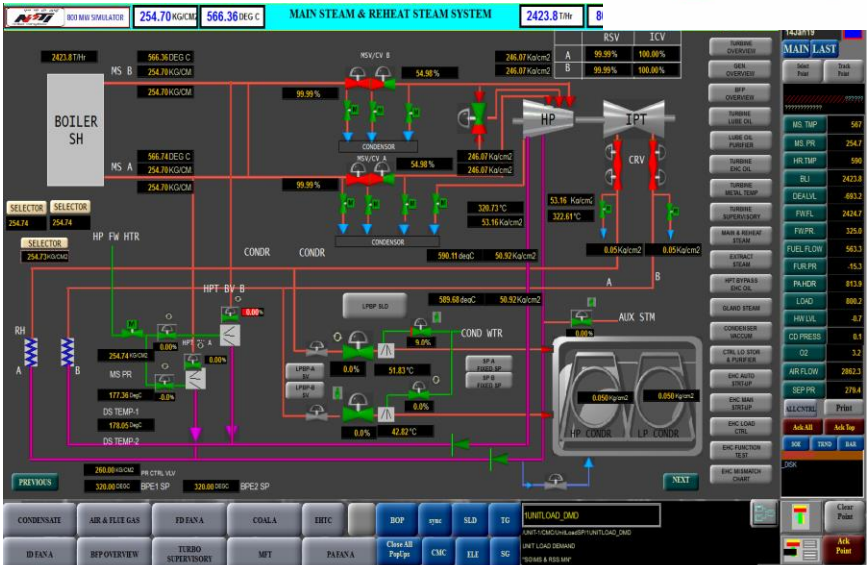


# International Training for Bhutan

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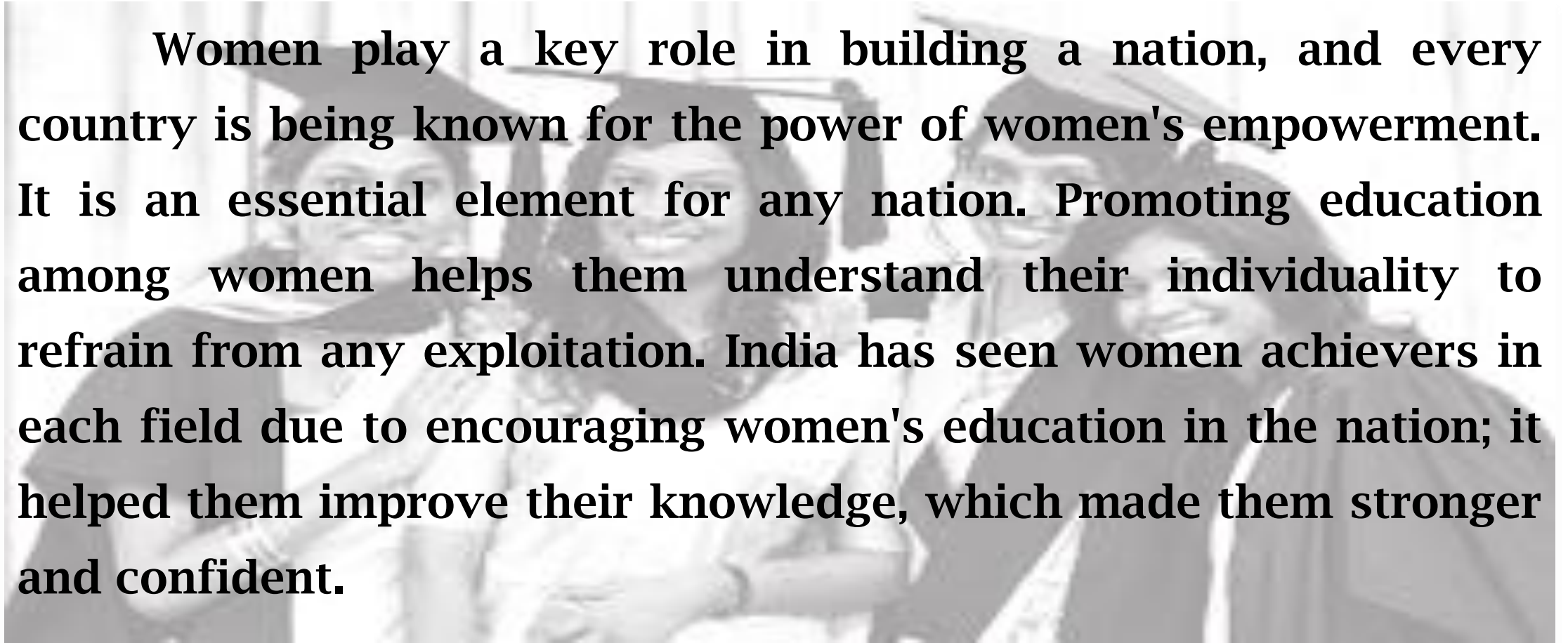
# Hi - Tech Real - Time Simulators



# **Importance of Women Education in India**

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**Women play a key role in building a nation, and every country is being known for the power of women's empowerment. It is an essential element for any nation. Promoting education among women helps them understand their individuality to refrain from any exploitation. India has seen women achievers in each field due to encouraging women's education in the nation; it helped them improve their knowledge, which made them stronger and confident.**



# **NPTI (PSTI), Bangalore has conducted 5 Days Internship Program for Women Students**

<b>Sl. No.</b>	<b>Name of the Internship Program</b>	<b>Participants</b>	<b>Duration</b>
1.	Internship Program on Accounting and Personality Development	40 Women Students from Vivekanandha College of Arts and Science for Women, Elayampalayam, Tamilnadu	5 Days; from 19 <sup>th</sup> to 23 <sup>rd</sup> September, 2022
2.	Internship Program on Accounting and Personality Development	40 Women Students from Vivekanandha College of Arts and Science for Women, Elayampalayam, Tamilnadu	5 Days; from 10 <sup>th</sup> to 14 <sup>th</sup> October, 2022
3.	Internship Program on Accounting and Personality Development	40 Women Students from Vivekanandha Arts and Science College for Women, Sankari - TK, Salem District, Tamilnadu	5 Days; from 07 to 11 November, 2022



**Batch-I**



**Batch-II**





**Batch-III**





ऊर्जा संरक्षण पर क्षमता संवर्धन कार्यक्रम - सुल्तानगंज डाइट परिसर भोगाँव मैनपुरी



ऊर्जा संरक्षण पर क्षमता संवर्धन कार्यक्रम - राँबर्ट्सगंज - सोनभद्र



ऊर्जा संरक्षण पर क्षमता संवर्धन कार्यक्रम - जिला हापुड़



ऊर्जा संरक्षण पर क्षमता संवर्धन कार्यक्रम - बड़ौत बागपत



ऊर्जा संरक्षण पर क्षमता संवर्धन कार्यक्रम - प्रयागरज, उत्तर प्रदेश



ऊर्जा संरक्षण पर क्षमता संवर्धन कार्यक्रम - खिरकिया कुशीनगर

# Training Needs Analysis in RE Sector



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- **Mini and Micro Grids**
  - **Floating Solar Plants**
  - **Solar-Wind Hybrid Plants**
  - **Off-Shore Wind Plants**
  - **Battery Storage**

Each emerging above listed topics needs to have a separate training program in four different areas listed below:

- **Business Development**
- **Design**
- **Construction and commissioning**
- **Operation and Maintenance (O&M)**

S. NO.	Topic	Training in Specialized Area	Duration **
1.	Mini and Micro Grids	Business Development	Short term Training
		Design	Medium term Training
		Construction and commissioning	Sort and Medium term Training
		Operation and Maintenance (O&M)	Medium term Training
2.	Floating Solar Plants	Business Development	Short term Training
		Design	Short term Training
		Construction and commissioning	Short term Training
		Operation and Maintenance (O&M)	Short term Training

3.	<b>Solar-Wind Hybrid Plants</b>	Business Development	Short term Training
		Design	Medium term Training
		Construction and commissioning	Short term Training
		Operation and Maintenance (O&M)	Medium term Training
4.	Off-Shore Wind Plants	Business Development	Short term Training
		Design	Medium term Training
		Construction and commissioning	Medium term Training
		Operation and Maintenance (O&M)	Medium term Training
5.	Battery Storage	Business Development	Short term Training
		Design	Medium term Training
		Construction and commissioning	Short term Training
		Operation and Maintenance (O&M)	Medium term Training





**Thank You**

## Group Discussion Question 4 (10 minutes)

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- Identify 3 top key technical trainings that you would like to take or deliver in your organization?



Go to [www.menti.com](https://www.menti.com) and use the code 78 48 03 0

 Mentimeter

Identify 3 top key technical trainings that you would like to take or deliver in your organization?




## Group Discussion Question 5 (10 minutes)

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- Identify 3 top soft skills trainings that you intend to take or deliver in your organization?



Go to [www.menti.com](https://www.menti.com) and use the code 78 48 03 0

Identify 3 top soft skills trainings that you intend to take or deliver in your organization?  Mentimeter





# Dr. Maria Beatriz Orlando, Lead Social Development Specialist, World Bank

## Closing Remarks

3<sup>rd</sup> WePOWER Regional  
Conference

Bangkok, Thailand (Dec 6-8, 2022)



