

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR GREEN JOBS



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What are Occupational Standards (OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack- Rooftop Solar Photovoltaic Entrepreneur

SECTOR: GREEN JOBS

SUB-SECTOR: Renewable Energy

OCCUPATION: Rooftop Solar Photovoltaic Entrepreneur

REFERENCE ID: SGJ/Q0104

ALIGNED TO: NCO-2015/NIL

Rooftop Solar Photovoltaic Entrepreneur is an individual having the ability to start a solar company and venture into Solar Rooftop market.

Brief Job Description: Rooftop Solar Photovoltaic Entrepreneur is an individual having the ability to venture into Solar Rooftop market to lead an enterprise as he/she has the understanding of solar business models and has the technical knowledge of rooftop solar PV plants along with the components available in the local market. He can prepare the feasibility study report and basic energy generation forecasting using simulation softwares. He/she is responsible for the managing the complete Solar PV rooftop project lifecycle.

Personal Attributes: The individual is required to have good interpersonal and problem solving skills. The individual must be self-driven and organized with their work and act with integrity while performing multiple task for the customers with quality deliverables.



Job Details	Qualifications Pack Code	SGJ/Q0104		
	Job Role	Rooftop Solar Photovoltaic Entrepreneur This job role is applicable in both national and international scenarios		
	Credits(NSQF)	TBD	Version number	1.0
	Sector	Green Jobs	Drafted on	15/04/2016
	Sub-sector	Renewable Energy	Last reviewed on	02/05/2016
	Occupation	Rooftop Solar Photovoltaic Entrepreneur	Next review date	01/05/2019
	NSQC Clearance on	N.A		

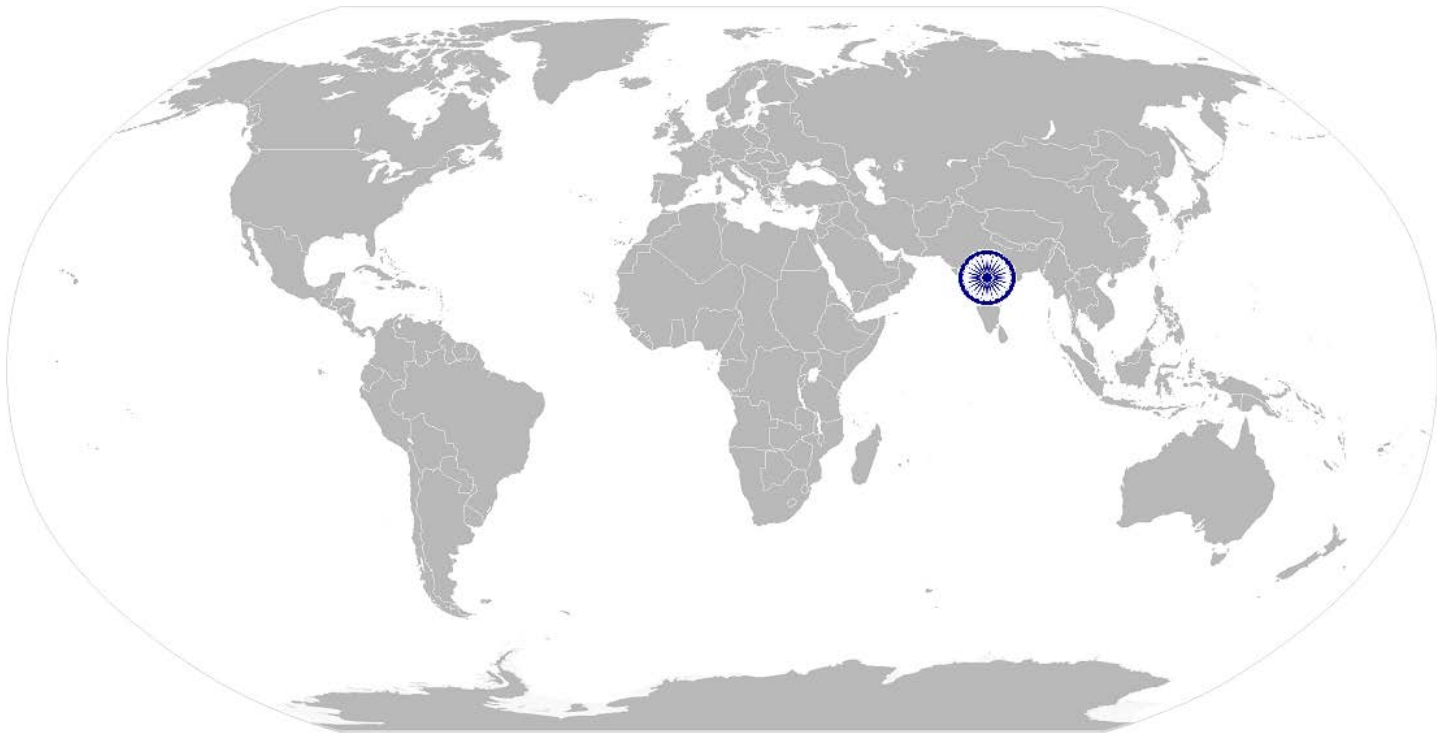
Job Role	ROOFTOP SOLAR PHOTOVOLTAIC ENTREPRENEUR
Role Description	Rooftop Solar Photovoltaic Entrepreneur is an individual having the ability to venture into Solar Rooftop market to lead an enterprise, prepare the feasibility study report and is responsible for the managing the complete Solar rooftop PV project lifecycle.
NSQF level	6
Minimum Educational Qualifications	B.E. / B. Tech. / Any Graduate with Science background, preferred
Maximum Educational Qualifications	Not Applicable.
Training (Suggested but not mandatory)	N/A
Minimum Job Entry Age	21 years.
Experience	Not Required.
Applicable National Occupational Standards (NOS)	<p>Compulsory: SGJ/N0108: Carry out market research and prepare a cost estimate for a Rooftop Solar Photovoltaic plant SGJ/N0109: Prepare site feasibility study report SGJ/N0110: Manage Solar PV project lifecycle SGJ/N0111: Entrepreneurship skills SGJ/N0106: Maintain Personal Health & Safety at project site</p> <p>Optional: Not Applicable.</p>
Performance Criteria	As described in the relevant OS units.

Definitions	Keywords/Terms	Description
	Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
	Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
	Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
	Function	Function is an activity necessary for achieving the key purpose of the sector, occupation or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
	Job Role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization
	OS	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
	Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
	NOS	NOS are Occupational Standards which apply uniquely in the Indian context.
	Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack
	Qualifications Pack	Qualifications Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
	Unit Code	Unit Code is a unique identifier for an Occupational Standard, which is denoted by an 'N'.
	Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
	Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
	Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to conform to the required standard.
	Organizational Context	Organizational Context includes the way the organization is structured And how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
	Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills or Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.	



SGJ/ N0108 **Carry out market research and prepare a cost estimate for a Rooftop Solar Photovoltaic plant**

National Occupational Standard



Overview

This unit is about the preparation of cost estimate of rooftop Solar PV plant. This unit also includes understanding about the solar photovoltaic technology and its components.

SGJ/ N0108 Carry out market research and prepare a cost estimate for a Rooftop Solar Photovoltaic plant

National Occupational Standard	Unit Code	SGJ / N0108
	Unit Title (Task)	Carry out market research and prepare a cost estimate for a Rooftop Solar Photovoltaic plant
	Description	This unit is about assessing the cost of system installation and identification of various business models
	Scope	This unit covers the following: <ul style="list-style-type: none"> Assess the quality of solar components Assess the cost of solar PV power plant and carry out basic financial calculations Select the appropriate business model for the solar rooftop sector
	Performance Criteria(PC) w.r.t. the Scope	
	Element	Performance Criteria
	Assess the quality of solar components	To be competent, the user/ individual must be able to: <ul style="list-style-type: none"> PC1. select the right quality of solar module by identifying the key technical parameters in data specification sheets PC2. select the right quality of inverter by identifying the key technical parameters in data specification sheets PC3. select the right quality of mounting structure by identifying the key technical parameters in data specification sheets PC4. select the right quality of battery by identifying the key technical parameters in data specification sheets PC5. select the balance of system by identifying the key technical parameters
	Assess the cost of system and carry out basic financial calculations	To be competent, the user/ individual must be able to: <ul style="list-style-type: none"> PC6. Identify market price of different components of solar PV system PC7. prepare a cost estimate for a solar project PC8. prepare a cost benefit analysis for a rooftop solar PV plant including LCOE, Payback, IRR etc.
	Select the appropriate business model for the solar rooftop sector	To be competent, the user/ individual must be able to: <ul style="list-style-type: none"> PC9. Identify the policy, regulations and procedures for solar rooftop sector in the local market PC10. identify and select the appropriate business models in solar rooftop sector
	Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company /organization and its processes)	The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> KA1. Company's installation policy KA2. Company's customer support policy KA3. Company's documentation policy KA4. Document information using appropriate corporate forms KA5. Obtain authorization from specified field safety officer and supervisor 	

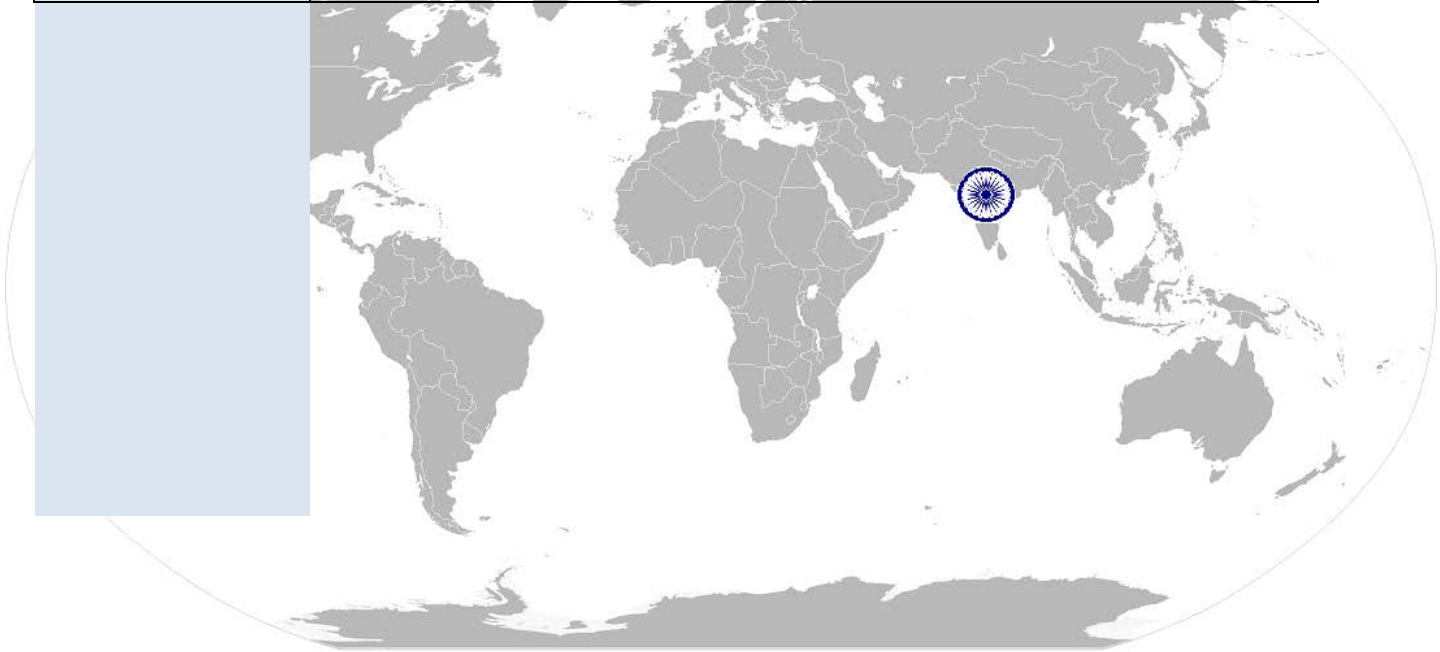
SGJ/ N0108 Carry out market research and prepare a cost estimate for a Rooftop Solar Photovoltaic plant

<p>B. Technical Knowledge</p>	<p>The individual on the job needs to know and understand:</p> <p>KB1. Definition of the terms: energy and power, cell, module, string, array, mono-crystalline, poly-crystalline, amorphous silicon</p> <p>KB2. Knowledge of all the technical parameters and interpretation of specification sheets of different components</p> <p>KB3. Fundamentals of solar resource like GHI, DNI etc.</p> <p>KB4. Effect on array output of current and voltage based on series / parallel connections of modules, tilt angle, orientation and shading</p> <p>KB5. Perform simple calculations to derive the power and energy received from solar radiation in a given area</p> <p>KB6. Efficiency, cost and typical specifications, functioning and operating principle of different types of solar photovoltaic plants, commercially available PV modules, inverters, charge controllers, battery, mounting structures, cables, junction boxes and other components</p> <p>KB7. Mechanical and electrical features necessary for the long life of the PV power plant under a wide range of operating conditions</p> <p>KB8. Prepare costing and cost benefit analysis for project including ICOE, Payback, IRR etc.</p> <p>KB9. Project budgeting</p> <p>KB10. Business models for solar rooftop sector like capex, opex, boot, etc.</p> <p>KB11. Policy, regulations and procedures for installing a rooftop solar PV power plant</p> <p>KB12. Net metering and gross metering concepts</p>
<p>Skills (S)</p>	
<p>A. Core Skills/ Generic Skills</p>	<p>Writing Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. Prepare and maintain documentation.</p> <p>Reading Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA2. Read vernacular/English language</p> <p>SA3. Read and understand manuals, health and safety instructions, memos, other company documents</p> <p>SA4. Read from different sources- books, screens in machines and signage.</p> <p>SA5. Read various colour codes, as per standard electrical, mechanical and civil nomenclature.</p> <p>Oral Communication (Listening and Speaking skills)</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. Express statements or information clearly so that others can hear and understand</p> <p>SA7. Participate in and understand the main points of simple discussions</p> <p>SA8. Respond appropriately to any queries</p> <p>SA9. Communicate with employees</p>
<p>B. Professional Skills</p>	<p>Decision making</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. Define organization rule- based decision making process</p> <p>SB2. Take decision with systematic course of actions and/or response</p> <p>Plan and organize</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. Plan and organize work schedule to meet deadlines.</p> <p>SB4. Work constructively and collaboratively with others.</p>



SGJ/ N0108 Carry out market research and prepare a cost estimate for a Rooftop Solar Photovoltaic plant

	Customer centricity
	The user/individual on the job needs to know and understand how to: SB5. Prepare organization code of conduct. SB6. Manage relationships with customers with intent on satisfying its requirements for service delivery.
	Problem solving
	The user/individual on the job needs to know and understand how to: SB7. Recognize problems and search for solutions. SB8. Choose best methods to complete assigned tasks.
	Analytical thinking
	The user/individual on the job needs to know and understand how to: SB9. Apply domain knowledge, observations and data to select course of action to perform tasks related to solar photovoltaic power plant.
	Critical thinking
	The user/individual on the job needs to know and understand how to: SB10. Critically evaluate information obtained from customers and workers to perform day to day activities. SB11. Ask questions for better understanding.

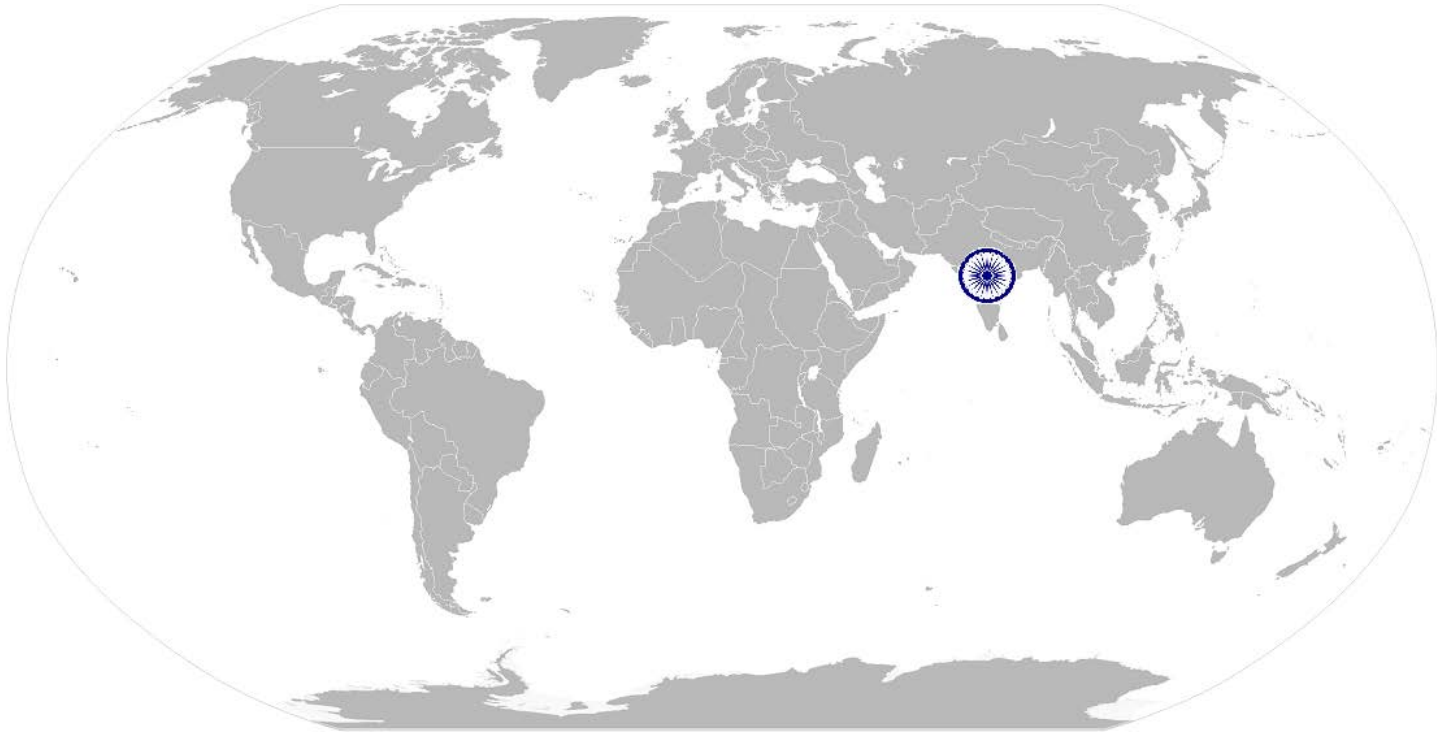




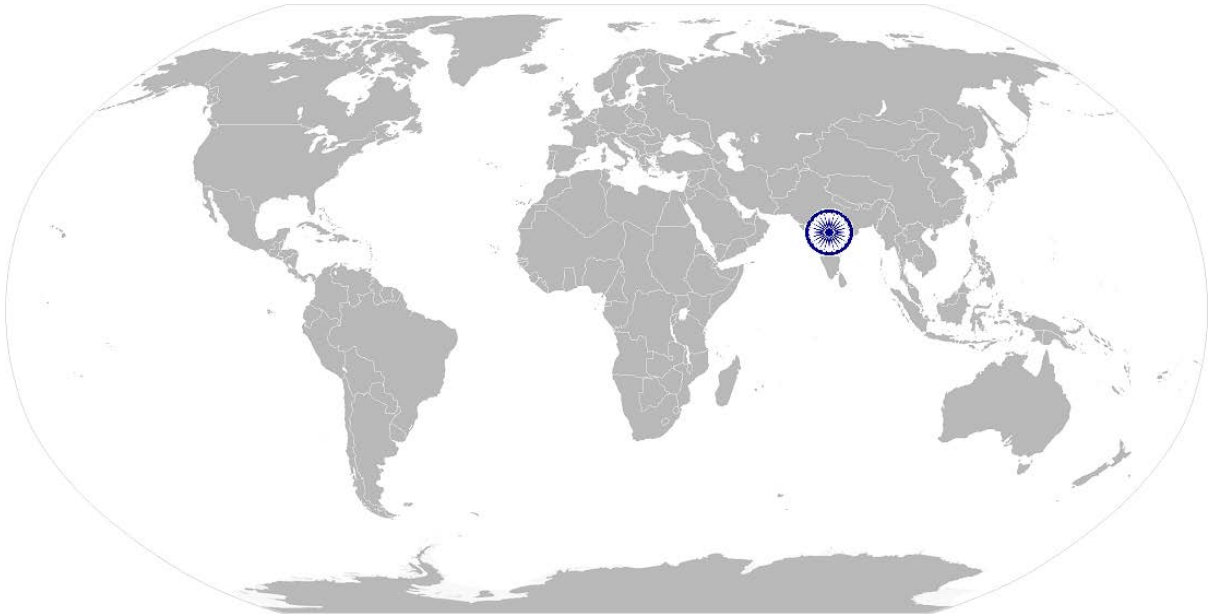
**SGJ/ N0108 Carry out market research and prepare a cost estimate for a Rooftop Solar
Photovoltaic plant**

NOS Version Control

NOS Code	SGJ/N0108		
Credits (NSQF)	TBD	Version number	1.0
Industry Sector	Green Jobs	Drafted on	15/04/2016
Industry Sub-sector	Renewable Energy	Last reviewed on	02/05/2016
Occupation	Solar Market Analyst	Next review date	01/05/2019



National Occupational Standard



Overview

This unit is about the key steps involved in preparing a site feasibility report for rooftop solar PV power plant along with the assessment of client's requirement.

SGJ/N0109

Prepare site feasibility study report

National Occupational Standard

Unit Code	SGJ/N0109
Unit Title (Task)	Prepare site Feasibility Study Report
Description	This unit is about the key steps involved in developing a site feasibility report for rooftop solar PV system along with assessing client requirement
Scope	This unit/ task covers the following: <ul style="list-style-type: none"> Assess the rooftop condition Assess the client requirement Prepare site feasibility study report
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Assess the rooftop condition	To be competent, the user/ individual must be able to: <ul style="list-style-type: none"> PC1. Identify optimum location of installations PC2. Assess the site level pre-requisites for solar panel installation PC3. Decide on the type of mounting to be constructed and place of mounting as per client requirement PC4. Check for any shading obstacles PC5. Prepare a site map of the location where installation has to be carried out
Assess the client requirement	To be competent, the user/ individual must be able to: <ul style="list-style-type: none"> PC6. Assess the load to be run on solar pv power plant and prepare a load profile PC7. Estimate the capacity of solar pv power plant PC8. Decide on battery backup as per grid availability, loads and client expectation
Prepare site feasibility study report	To be competent, the user/ individual must be able to: <ul style="list-style-type: none"> PC9. Assess or obtain the site specific major parameters of solar resource data like GHI, DNI, Temperature and Wind PC10. Perform shading analysis PC11. Estimate the energy generated from the rooftop solar PV power plant using solar design softwares like PV*SOL®, PVsyst, etc. PC12. Identify the risks associated with the specific solar project PC13. Prepare a site Feasibility Study Report using specialized software like PV*SOL®, PVsyst, etc.
Knowledge and Understanding (K)	
A. Organizational Context	The individual on the job needs to know and understand: <ul style="list-style-type: none"> KA1. Company's policies on: incentives, personnel management KA2. Company's code of conduct KA3. Importance of individual's role in the work flow KA4. Company's documentation policy KA5. Company's installation policy KA6. Company's customer support policy

SGJ/N0109

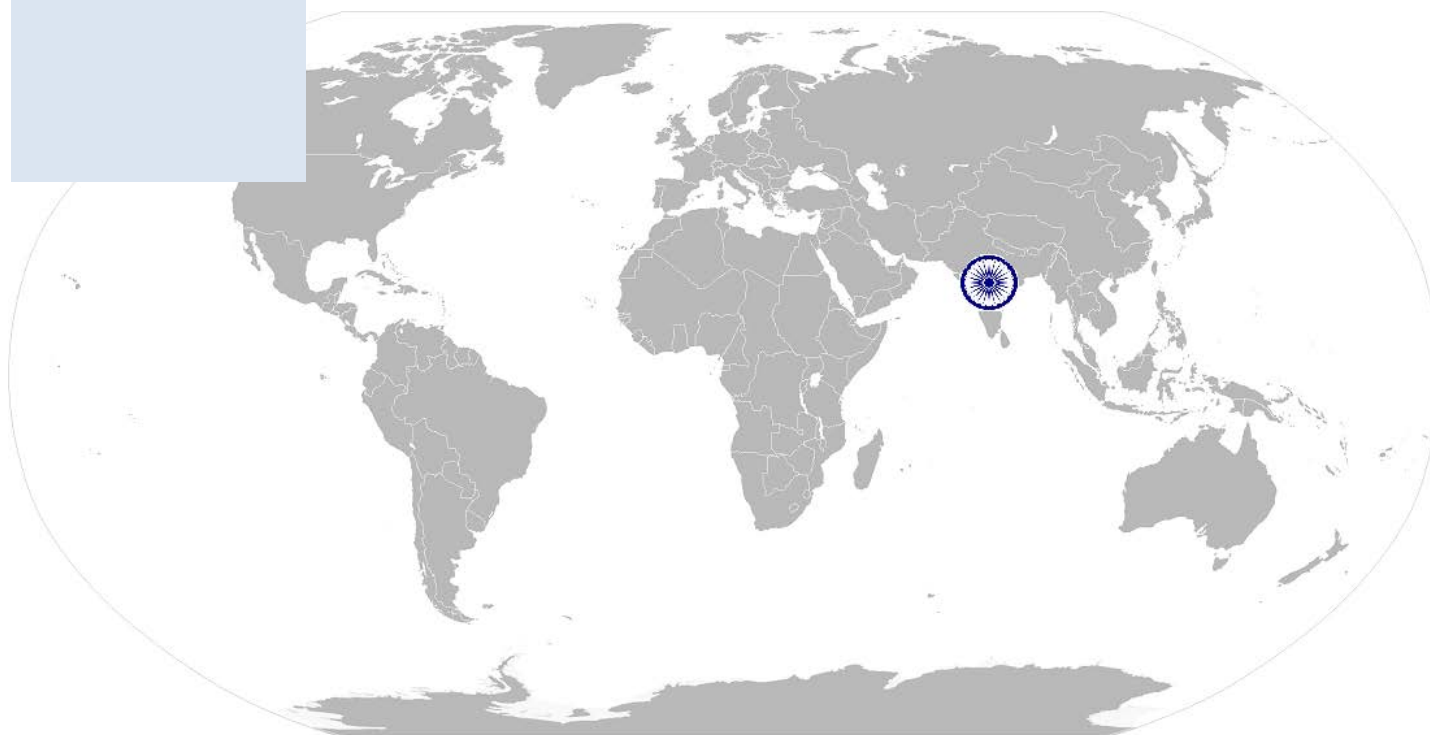
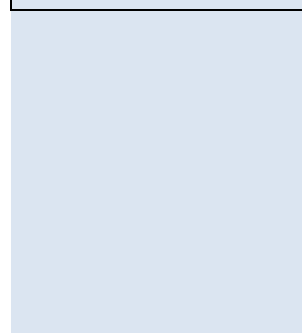
Prepare site feasibility study report

<p>B. Technical Knowledge</p>	<p>The individual on the job needs to know and understand:</p> <p>KB1. Perform simple calculations to derive the power and energy received from solar radiation in a given area</p> <p>KB2. Solar resource assessment including direct normal irradiation, diffuse horizontal irradiation, global horizontal irradiation and albedo.</p> <p>KB3. Understand ground based measurement and satellite derived data</p> <p>KB4. Determine the building orientation.</p> <p>KB5. Types of roofs and suggestive mounting structure for that specific roof basic concepts of trigonometry and coordinate geometry</p> <p>KB6. Effect on array output of current and voltage based on series / parallel connections of modules, tilt angle, orientation and shading.</p> <p>KB7. Determining whether any shading will occur and estimate its effect on the system using tools like solar path finder and softwares like pv*sol®, pvsyst, etc.</p> <p>KB8. Determining the cabling route and estimate the length of cable required.</p> <p>KB9. Different types of tracking systems</p> <p>KB10. How to use a simulation software, such as pv*sol®, pvsyst, etc. , optimally.</p> <p>KB11. Risks associated with the solar project</p>
<p>Skills (S)</p>	
<p>A. Core Skills/ Generic Skills</p>	<p>Writing Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. Prepare and maintain documentation</p> <p>Reading Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA2. Read vernacular/english language</p> <p>SA3. Read and understand manuals, health and safety instructions, memos, other company documents</p> <p>SA4. Read from different sources- books, screens in machines and signage</p> <p>SA5. Read various colour codes, as per standard electrical, mechanical and civil nomenclature</p> <p>Oral Communication (Listening and Speaking skills)</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. Express statements or information clearly so that others can hear and understand</p> <p>SA7. Participate in and understand the main points of simple discussions</p> <p>SA8. Respond appropriately to any queries</p> <p>SA9. Communicate with employees</p>
<p>B. Professional Skills</p>	<p>Decision making</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. Define organization rule- based decision making process</p> <p>SB2. Take decision with systematic course of actions and/or response</p> <p>Plan and organize</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. Plan and organize work schedule to meet deadlines</p> <p>SB4. Work constructively and collaboratively with others</p> <p>Customer centricity</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB5. Prepare organization code of conduct</p> <p>SB6. Manage relationships with customers with intent on satisfying its requirements for service delivery</p>

SGJ/N0109

Prepare site feasibility study report

	Problem solving
	The user/individual on the job needs to know and understand how to: SB7. Recognize problems and search for solutions SB8. Choose best methods to complete assigned tasks
	Analytical thinking
	The user/individual on the job needs to know and understand how to: SB9. Apply domain knowledge, observations and data to select course of action to perform tasks related to solar photovoltaic power plant
	Critical thinking
	The user/individual on the job needs to know and understand how to: SB10. Critically evaluate information obtained from customers and workers to perform day to day activities SB11. Ask questions for better understanding

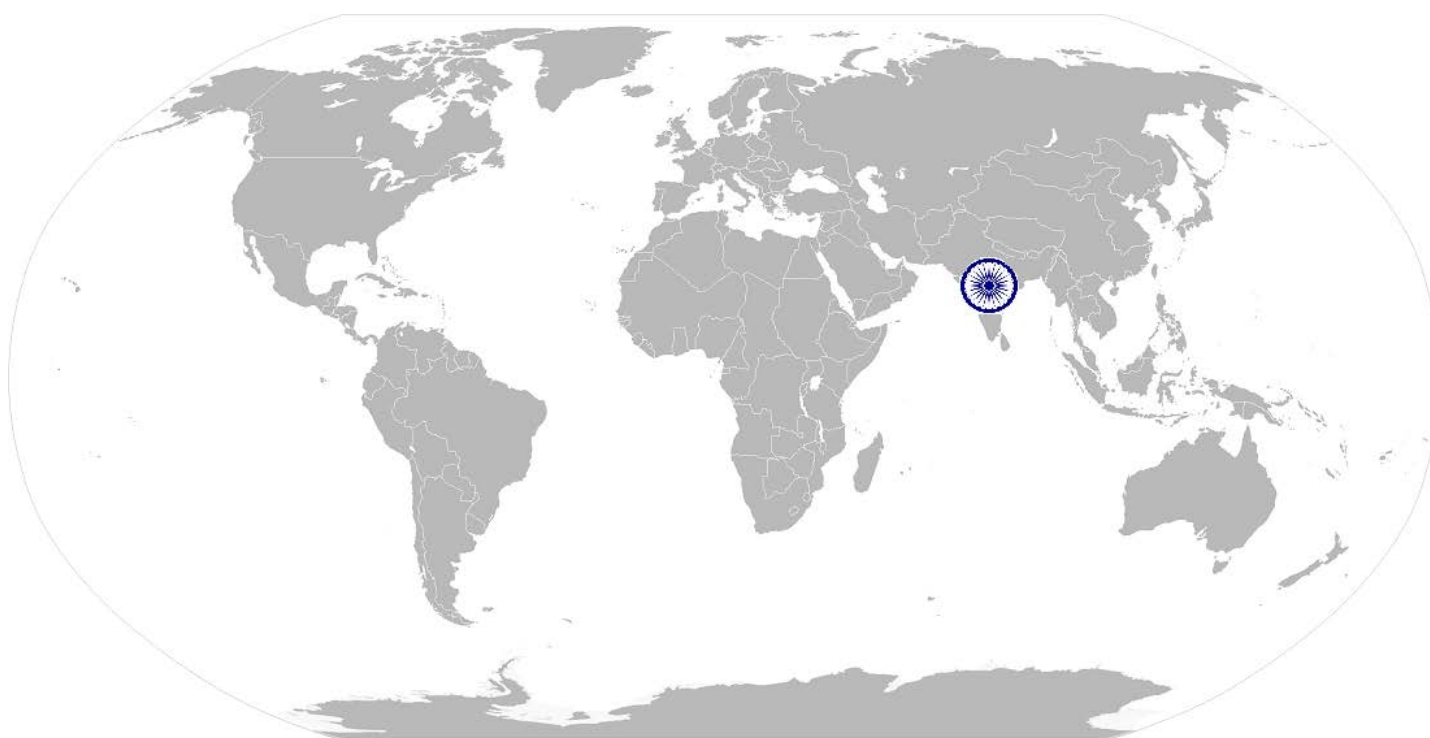


SGJ/N0109

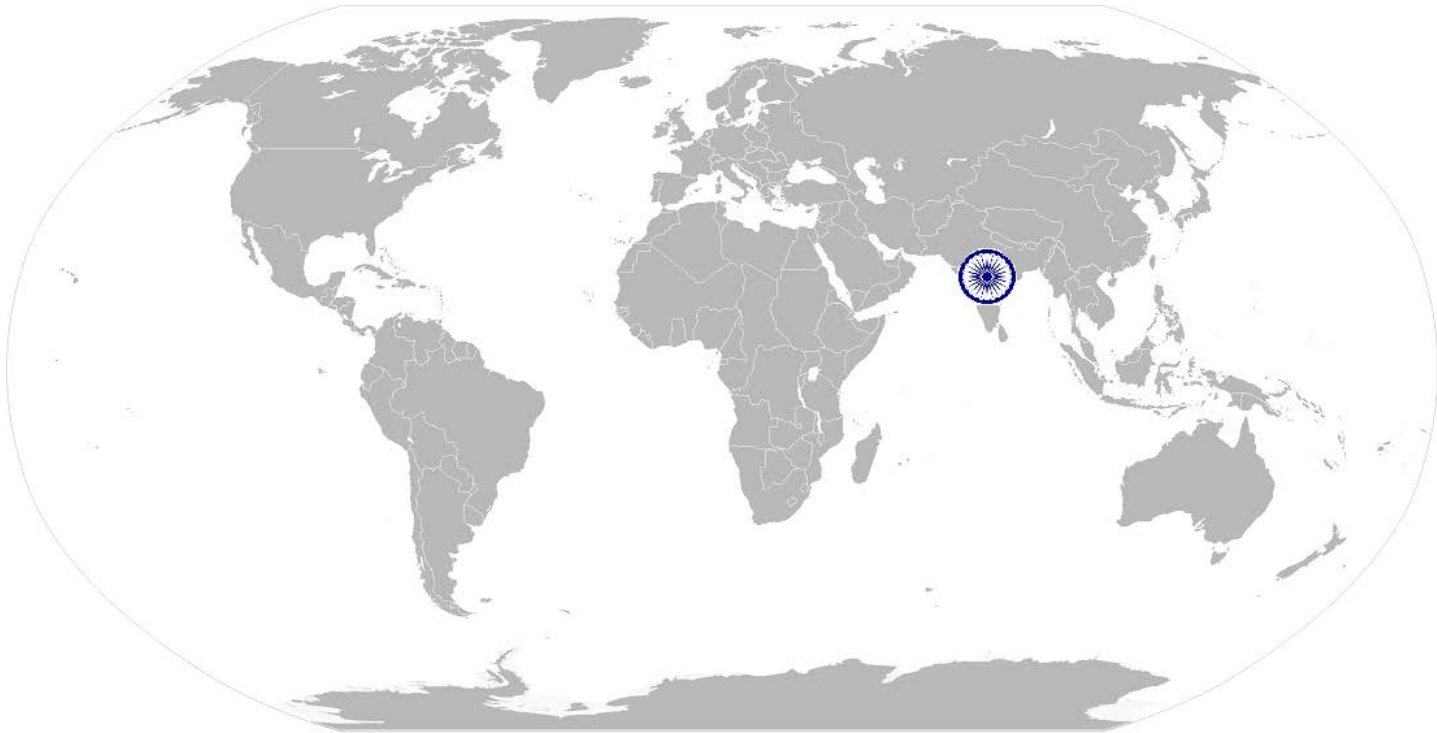
Prepare site feasibility study report

NOS Version Control

NOS Code	SGJ/N0109		
Credits(NSQF)	TBD	Version number	1.0
Industry	Green jobs	Drafted on	15/04/2016
Industry Sub-sector	Renewable energy	Last reviewed on	02/05/2016
Occupation	Solar Site Survey	Next review date	01/05/2019



National Occupational Standard



Overview

This unit is about managing the project lifecycle of Rooftop Solar Photovoltaic Power Plant.

SGJ/ N0110

Manage Solar PV project lifecycle

National Occupational Standard

Unit Code	SGJ / N0110
Unit Title (Task)	Manage Solar PV project lifecycle
Description	This unit is about the managing the implementation schedule and maintenance of rooftop solar PV project for effective functioning to achieve the specified output.
Scope	<p>This OS unit/task covers the following:</p> <ul style="list-style-type: none"> • Prepare the lifecycle cost of a rooftop solar project • Identify and mitigate project risks • Prepare action plan and coordinate the implementation of a rooftop solar project • Maintain rooftop solar pv power plant
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Prepare the lifecycle cost of a rooftop solar project	<p>To be competent ,the user/individual on the job must be able to:</p> <p>PC1. Read and interpret the single line diagram, civil / mechanical drawings and electrical drawings</p> <p>PC2. Read and interpret the bill of material</p> <p>PC3. Calculate the lifecycle cost of a rooftop solar project</p>
Identify and mitigate project risks	<p>PC4. Identify and mitigate various risks associated with the project</p> <p>PC5. Ensure the solar PV system and structure meets the local government and regulatory requirements</p>
Prepare action plan and coordinate the implementation of rooftop solar project	<p>PC6. Coordinate with the design team to get the bill of material and drawings</p> <p>PC7. Coordinate with the supplier for timely delivery of components</p> <p>PC8. Ensure arrangement of skilled technicians and engineers for installation</p> <p>PC9. Prepare a draft project activity implementation plan</p> <p>PC10. Coordinate with supervisor at client's side to ensure timely implementation of project to avoid any cost overrun</p>
Maintain rooftop solar PV plant	<p>PC11. Identify the maintenance activity required for a rooftop solar PV power plant components</p> <p>PC12. Prepare a preventive maintenance schedule</p> <p>PC13. Ensure proper cleaning of solar panels periodically</p> <p>PC14. Ensure regular inspection of the solar PV system to identify and rectify the faults</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company/ organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Legislative, organization, site requirements and procedures</p> <p>KA2. The environmental requirements</p> <p>KA3. Work in varying weather conditions</p>

SGJ/ N0110

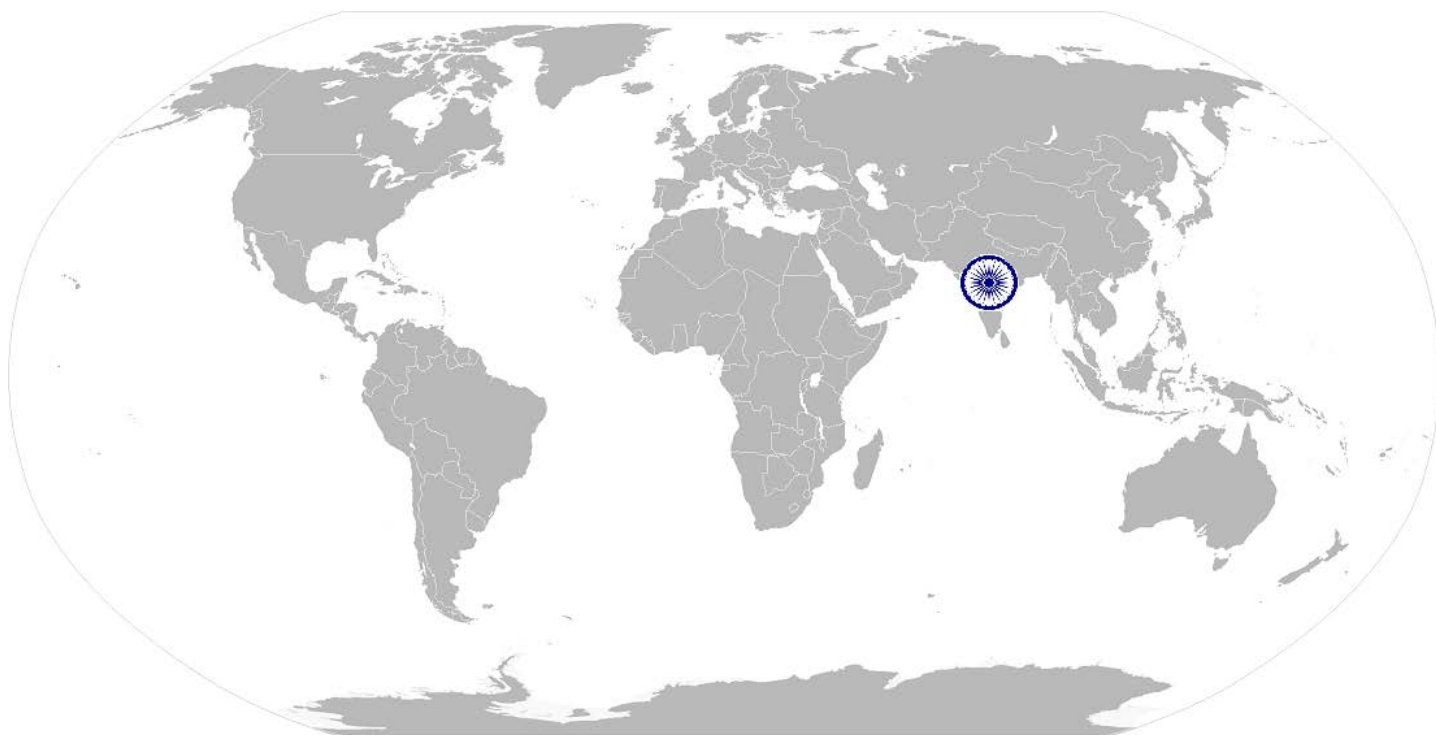
Manage Solar PV project lifecycle

<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Single line diagram, civil / mechanical drawings, electrical drawings and how to read a bill of material for a rooftop solar PV power plant</p> <p>KB2. Knowledge of excel and solar simulation softwares like PV*SOL®, PVsyst, etc</p> <p>KB3. Debt and equity financing options</p> <p>KB4. Understand sizing of solar PV system</p> <p>KB5. Different risks associated with the project like cost over-run, project completion risk, company risk related to key personnel and technical ability to execute on plans, environmental risk, financial risk, market risk, operational risk, technology risk and regulatory risk</p> <p>KB6. Preparation of an activity implementation plan for a rooftop solar project</p> <p>KB7. Maintenance activity required for a rooftop solar pv power plant components like solar modules, inverters, battery, mounting structures and balance of system.</p> <p>KB8. Preparation of preventive maintenance schedule for different components</p> <p>KB9. Tools involved in maintenance</p> <p>KB10. Identification and rectification of various faults that can occur in a solar pv power plant</p> <p>KB11. Safety precautions to be taken while handling different solar pv power plant components</p>
<p>Skills (S)</p>	
<p>A. Core Skills/ Generic Skills</p>	<p>Writing Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. Prepare and maintain proper documentation</p> <p>Reading Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA2. Ability to read from different sources- books screens in machines and signage</p> <p>SA3. Understand the various color codes, as per standard electrical, mechanical and civil nomenclature</p> <p>Communication skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. To clearly communicate installation and design instructions to team</p> <p>SA5. To clearly communicate customer's requirements</p> <p>SA6. Respond appropriately to any queries</p> <p>SA7. To communicate the constraints and quality requirements to team</p>
<p>B. Professional Skills</p>	<p>Decision Making</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. Take decision with systematic course of actions and/or response</p> <p>Plan and Organize</p> <p>The user/individual on the job needs to know and understand how to :</p> <p>SB2. Planning and organization of work to meet deadlines</p> <p>Customer Centricity</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. Follow code of conduct</p> <p>SB4. Manage relationships with customers with intent on satisfying its requirements for quality delivery</p>

SGJ/ N0110

Manage Solar PV project lifecycle

	Problem Solving
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB5. Recognize problems and search for solutions SB6. Choose best methods to complete assigned tasks SB7. Approach relevant authority when required
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB8. Apply domain knowledge, observations and data to select course of action to perform tasks related to Solar Photovoltaic Systems
	Critical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB9. Critically evaluate information obtained from customers and workers to perform day to day activities SB10. Ask questions for better understanding

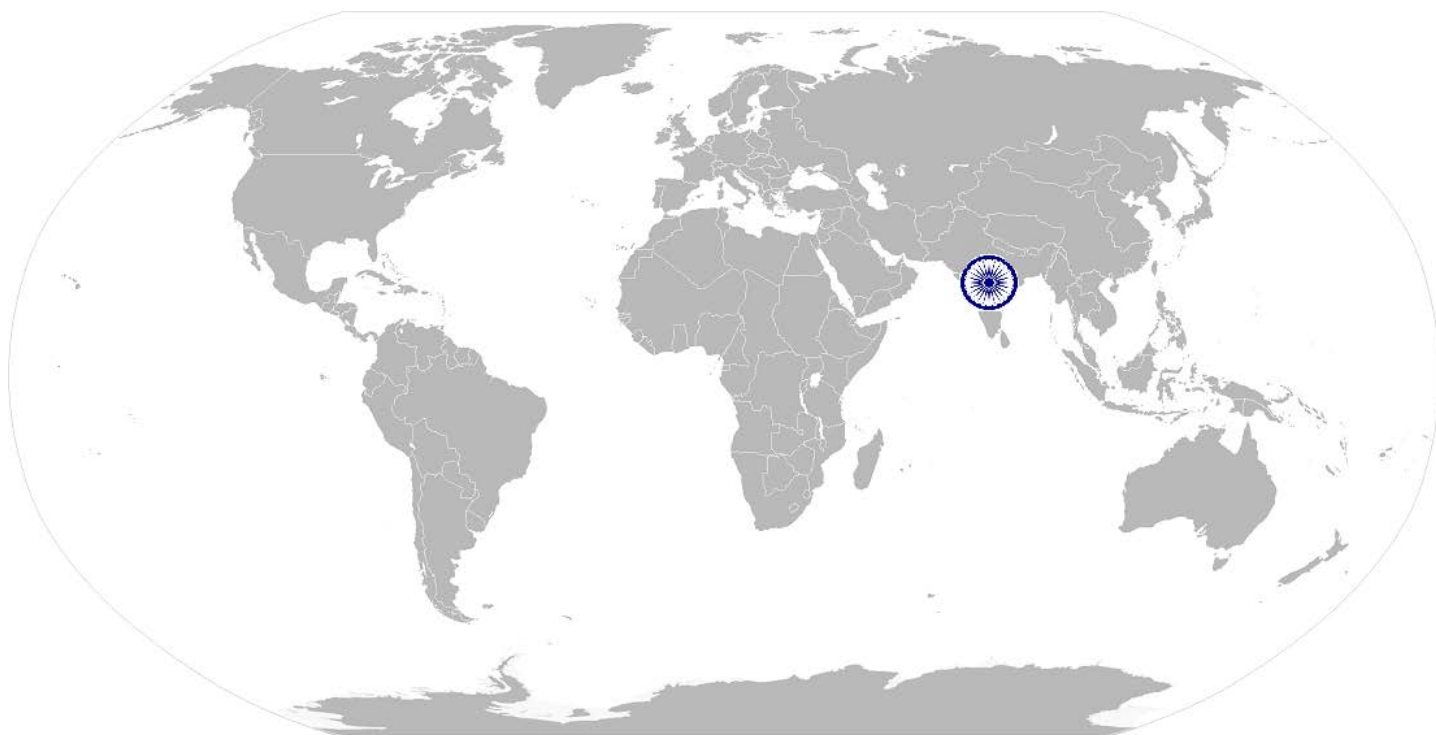


SGJ/ N0110

Manage Solar PV project lifecycle

NOS Version Control

NOS Code	SGJ/N0110		
Credits (NSQF)	TBD	Version number	1.0
Industry Sector	Green Jobs	Drafted on	15/04/2016
Industry Sub-sector	Renewable Energy	Last reviewed on	02/05/2016
Occupation	Solar Project management	Next review date	01/05/2019



National Occupational Standard



Overview

This unit is about developing entrepreneurship skills for starting a new business and managing it.

SGJ/ N0111

Entrepreneurship Skills

Unit Code	SGJ/N0111
Unit Title (Task)	Entrepreneurship Skills
Description	This unit is about developing entrepreneurship skills for starting a new business and managing it.
Scope	This unit/ task covers the following: <ul style="list-style-type: none"> Starting a new venture Maintaining a business.
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Starting a new venture	To be competent, the user/individual on the job must be able to: PC1. Describe the process for setting up a new venture PC2. Identify the key ingredients of a business plan PC3. Distinguish between fixed and working capital requirements PC4. Describe the components of a loan application for fund raising PC5. Demonstrate good Etiquettes and manners while communicating with the client PC6. Demonstrate the importance of time management PC7. Demonstrate leadership skills and effective resource management techniques
Maintaining a business	To be competent, the user/individual on the job must be able to: PC8. Demonstrate the use of MS word and MS excel for preparing a proposal PC9. Prepare a workable presentation for marketing and business development PC10. Choose the right buyer in a given situation of market parameters PC11. Identify the challenges and risks for new entrepreneurs and the possible mitigation measures
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. Government/corporate policies and guidelines on solar PV, solar rooftop KA2. Company's work safety policy KA3. Company's customer support policy KA4. Company's documentation policy KA5. Obtain authorization from specified field safety officer and supervisor KA6. Company's different department

SGJ/ N0111

Entrepreneurship Skills

<p>B. Technical Knowledge</p>	<p>The individual on the job needs to know and understand the following aspects:</p> <p>KB1. Definition of entrepreneurship from different perspectives</p> <p>KB2. Outline the importance of entrepreneurship: enhances creativity and innovation, builds self confidence in people, serves as a tool for nation building, serves as the engine of growth for the nation’s economy</p> <p>KB3. Explain the reasons why entrepreneurship should be developed in a country: reasons include: employment generation, increased national production and re-investing national resources</p> <p>KB4. State the characteristics of an entrepreneur: characteristics of the entrepreneurs, risk taking, innovation and creativity, opportunity orientation</p> <p>KB5. Explain the challenges/problems facing small businesses like financing and access to markets, government policies and inadequate managerial skills</p> <p>KB6. Describe the procedure for registering a business by defining a business idea, source of business idea, programs/ procedure and available schemes</p> <p>KB7. State the process of starting a new enterprises process by mobilizing and reorganizing resources</p> <p>KB8. study of different pictorial expression of non-verbal communication and its analysis</p> <p>KB9. Components of effective communication- conviction, confidence & enthusiasm, listening</p> <p>KB10. Kiss (keep it short & simple) in communication – composing effective messages</p> <p>KB11. Identifying one’s strength and weakness</p> <p>KB12. Time management concepts including discipline, punctuality, act in time on commitment and quality productive time</p> <p>KB13. Ability to shape and direct working/process methods according to self-defined criteria</p> <p>KB14. Empathize: comprehend other opinions points of views, and face them with understanding</p> <p>KB15. Learn MS word and MS excel: creating, organizing & formatting content, collaborating – merge, insert, view, edit, track mode etc.</p> <p>KB16. Understand the fixed and capital working requirements for running a business</p> <p>KB17. Understand how to make a business plan</p>
<p>Skills (S)</p>	
<p>A. Core Skills/ Generic Skills</p>	<p>Writing Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. Prepare and maintain documentation</p> <p>Reading Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA2. Read vernacular/english language</p> <p>SA3. Read and understand manuals, health and safety instructions, memos, other company documents</p> <p>SA4. Read from different sources- books, screens in machines and signage</p> <p>SA5. Read various colour codes, as per standard electrical, mechanical and civil nomenclature</p> <p>Oral Communication (Listening and Speaking skills)</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. Express statements or information clearly so that others can hear and understand</p> <p>SA7. Participate in and understand the main points of simple discussions</p> <p>SA8. Respond appropriately to any queries</p> <p>SA9. Communicate with employees</p>

SGJ/ N0111

Entrepreneurship Skills

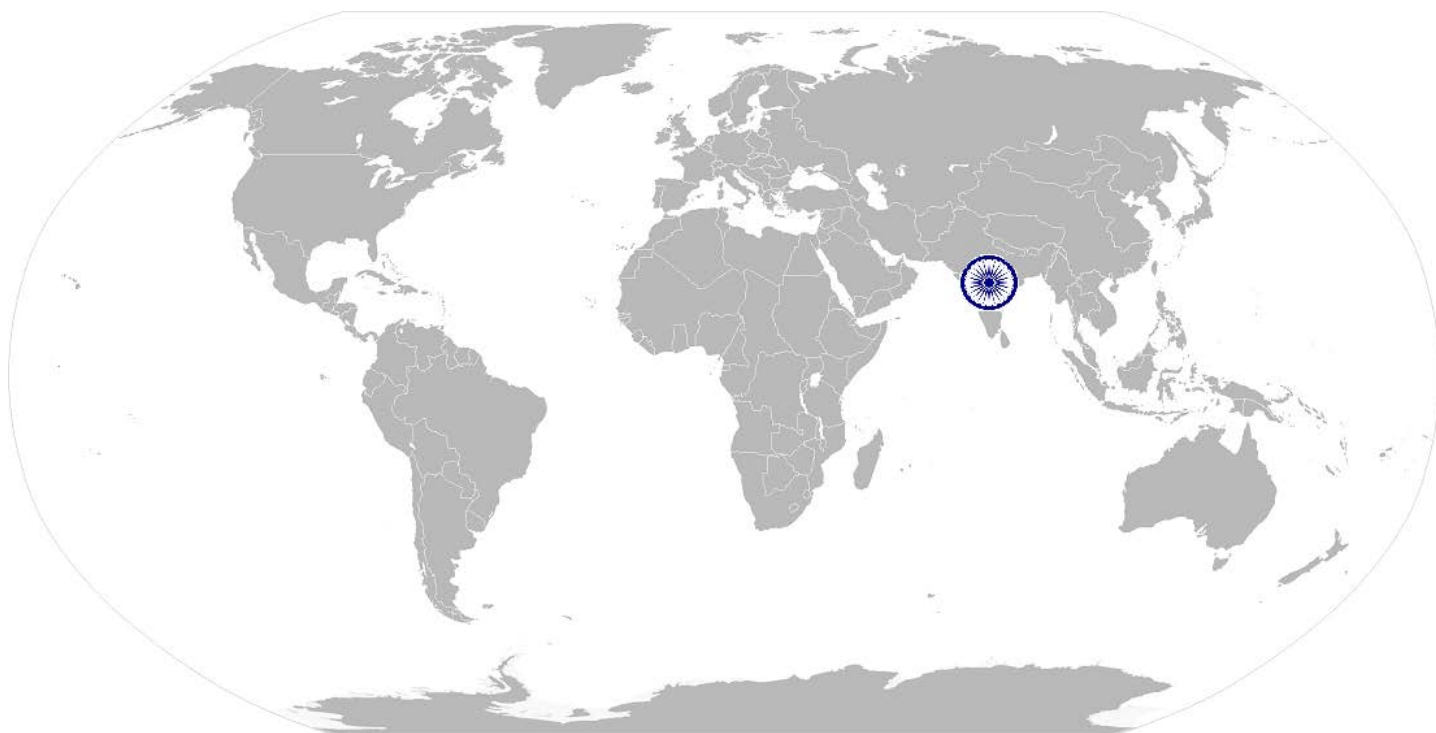
B. Professional Skills	Decision making
	The user/individual on the job needs to know and understand how to: SB1. Define organization rule- based decision making process SB2. Take decision with systematic course of actions and/or response
	Plan and organize
	The user/individual on the job needs to know and understand how to: SB3. Plan and organize work schedule to meet deadlines SB4. Work constructively and collaboratively with others
	Customer centricity
	The user/individual on the job needs to know and understand how to: SB5. Prepare organization code of conduct SB6. Manage relationships with customers with intent on satisfying its requirements for service delivery
	Problem solving
	The user/individual on the job needs to know and understand how to: SB7. Recognize problems and search for solutions SB8. Choose best methods to complete assigned tasks
	Analytical thinking
	The user/individual on the job needs to know and understand how to: SB9. Apply domain knowledge, observations and data to select course of action to perform tasks related to solar photovoltaic power plant
	Critical thinking
The user/individual on the job needs to know and understand how to: SB10. Critically evaluate information obtained from customers and workers to perform day to day activities SB11. Ask questions for better understanding	

SGJ/ N0111

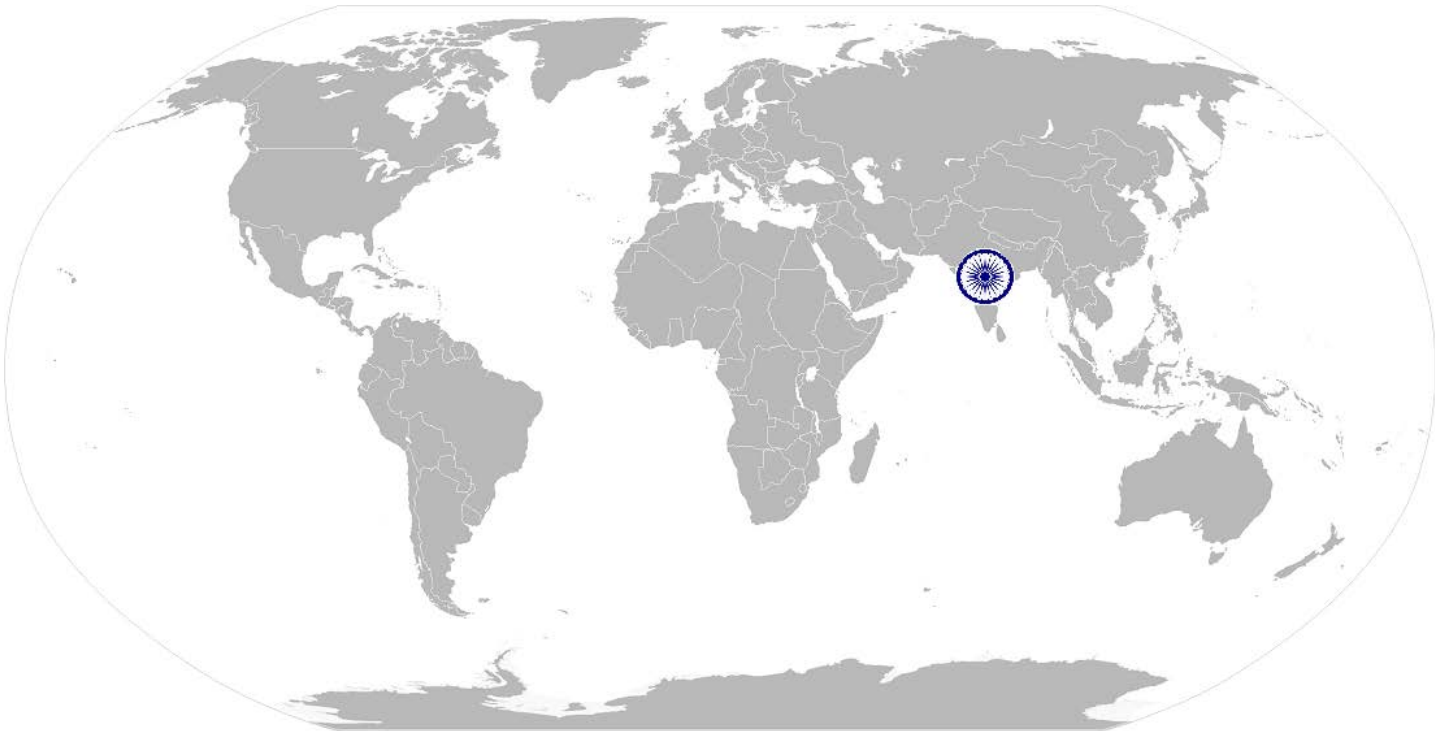
Entrepreneurship Skills

NOS Version Control

NOS Code	SGJ/N0111		
Credits (NSQF)	TBD	Version number	1.0
Industry Sector	Green Jobs	Drafted on	15/04/2016
Industry Sub-sector	Renewable Energy	Last reviewed on	02/05/2016
Occupation	Entrepreneur	Next review date	01/05/2019



National Occupational Standard



Overview

This unit is about maintaining Personal Health & Safety at project site.

SGJ/ N0106

Maintain Personal Health & Safety at project site

National Occupational Standard

Unit Code	SGJ / N0106
Unit Title (Task)	Maintain Personal Health & Safety at project site
Description	This unit is about maintaining Work Safety for Solar Photovoltaic Power Plants.
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Establish and follow safe work procedure • Use and maintain personal protective equipment • Identify and mitigate safety hazards • Demonstrate safe and proper use of required tools and equipment • Identify work safety procedures and instructions for working at height
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Establish and Follow safe work procedure	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. Identify corporate policies required for workplace safety</p> <p>PC2. Identify requirements for safe work area and create a safe work environment</p> <p>PC3. Identify contact person when workplace safety policies are violated</p> <p>PC4. Provide information about incident/violation</p> <p>PC5. Identify the location of first aid materials and administer first aid</p>
Use and maintain personal protective equipment	<p>PC6. Identify the personal protection equipment required for specific locations on-site</p> <p>PC7. Identify expiry dates and wear & tear issues of specified equipment</p> <p>PC8. Demonstrate safe and accepted practices for personal protection</p>
Identify and mitigate safety hazards	<p>PC9. Identify environmental hazards associated with photovoltaic installations</p> <p>PC10. Identify electrical hazards</p> <p>PC11. Identify personal safety hazards or work site hazards and mitigate hazards</p>
Demonstrate safe and proper use of required tools and equipment	<p>PC12. Select tools, equipment and testing devices needed to carry out the work</p> <p>PC13. Demonstrate safe and proper use of required tools and equipment</p>
Identify work safety procedures and instructions for working at height	<p>PC14. Check access from ground to work area to ensure it is safe and in accordance with requirements</p> <p>PC15. Reassess risk control measures, as required, in accordance with changed work practices and/or site conditions and undertake alterations</p> <p>PC16. Inspect/install fall protection and perimeter protection equipment ensuring adequacy for work and conformance to regulatory requirements</p> <p>PC17. Identify approved methods of moving tools and equipment to work area and minimize potential hazards associated with tools at heights</p> <p>PC18. Select and install appropriate signs and barricades</p> <p>PC19. Place tools and materials to eliminate or minimize the risk of items being knocked down</p> <p>PC20. Dismantle safety power plant in accordance with sequence and remove from worksite to clear work area</p>

SGJ/ N0106

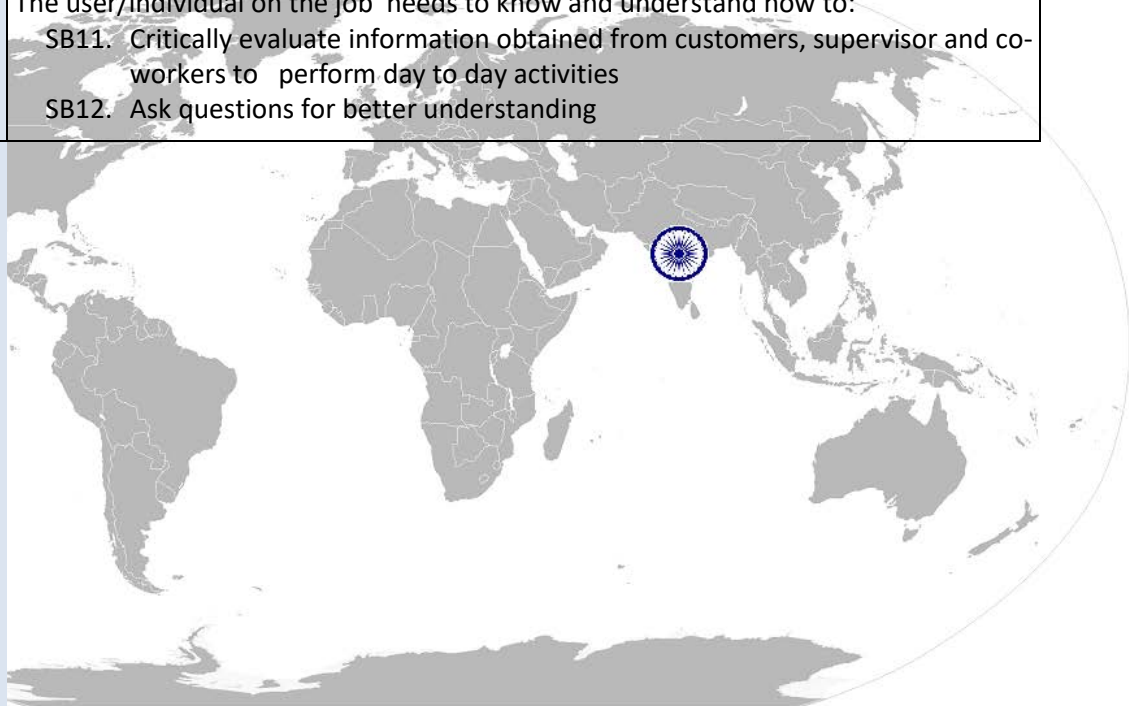
Maintain Personal Health & Safety at project site

Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> KA1. Company's installation policy KA2. Company's work safety policy KA3. Company's customer support policy KA4. Company's documentation policy KA5. Obtain authorization from specified field safety officer and supervisor KA6. Company's reporting structure and organization culture KA7. Company's different department and concerned authority
B. Technical Knowledge	<p>The individual on the job needs to know and understand the following aspects:</p> <ul style="list-style-type: none"> KB1. Relevant personal protective equipment's required for installation KB2. Relevant standards and regulations for installation of solar photovoltaic power plant in india KB3. Occupational health and safety (ohs) standards for installation of solar photovoltaic power plant KB4. Risk identification and mitigation procedure for safe installation of solar photovoltaic power plant KB5. Knowhow of tools & tackles required to carry out the work
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SA1. Fill up documentation applicable to one's role
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SA2. Read english and/or vernacular language SA3. Read and understand manuals, health and safety instructions, memos, other company documents SA4. Ability to read from different sources- books screens in machines and signage SA5. Understand the various color codes, as per standard electrical, mechanical and civil nomenclature
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SA6. Express statements or information clearly so that others can hear and understand SA7. Participate in and understand the main points of simple discussions SA8. Respond appropriately to any queries SA9. Communicate with supervisor
B. Professional Skills	Decision Making
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB1. Follow organization rule-based decision making process SB2. Take decision with systematic course of actions and/or response
	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to :</p> <ul style="list-style-type: none"> SB3. Planning and organization of work to meet deadlines SB4. Work constructively and collaboratively with others

SGJ/ N0106

Maintain Personal Health & Safety at project site

	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB5. Follow code of conduct SB6. Manage relationships with customers with intent on satisfying its requirements for service delivery
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB7. Recognize problems and search for solutions SB8. Choose best methods to complete assigned tasks SB9. Approach relevant authority when required
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB10. Apply domain knowledge, observations and data to select course of action to perform tasks related to Solar Photovoltaic Systems
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB11. Critically evaluate information obtained from customers, supervisor and co-workers to perform day to day activities SB12. Ask questions for better understanding

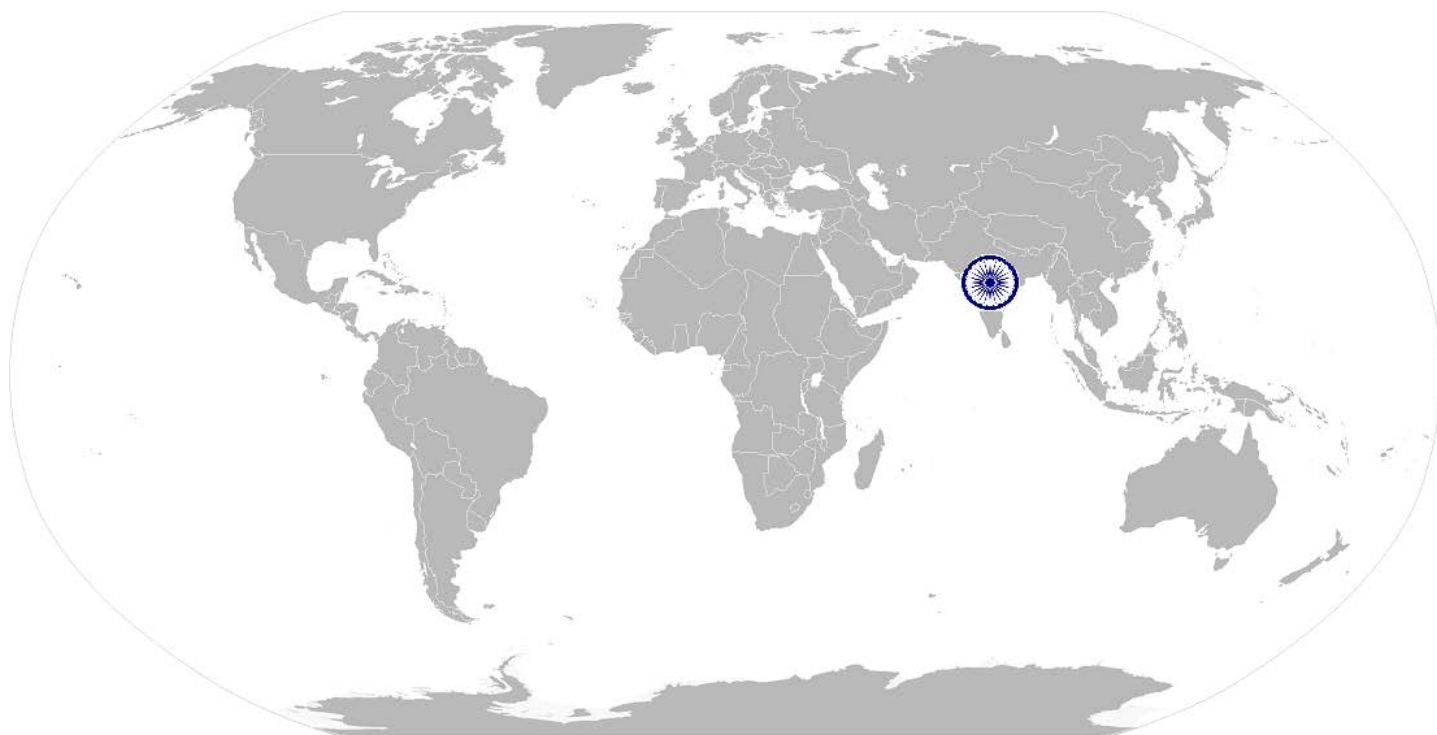


SGJ/ N0106

Maintain Personal Health & Safety at project site

NOS Version Control

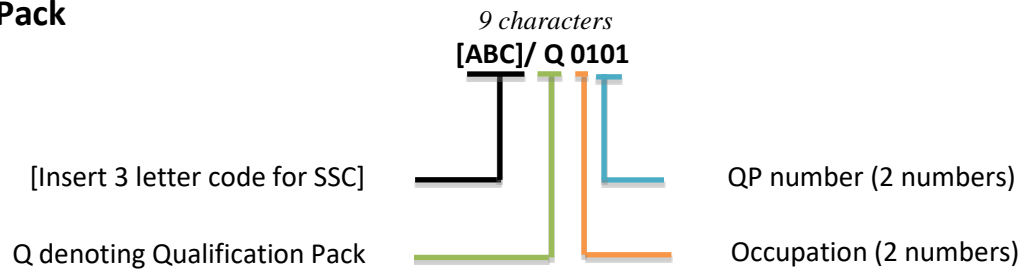
NOS Code	SGJ/N0106		
Credits (NSQF)	TBD	Version number	1.0
Industry Sector	Green Jobs	Drafted on	26/06/2015
Industry Sub-sector	Renewable Energy	Last reviewed on	21/10/2015
Occupation	Health & Safety	Next review date	01/10/2018



Annexure

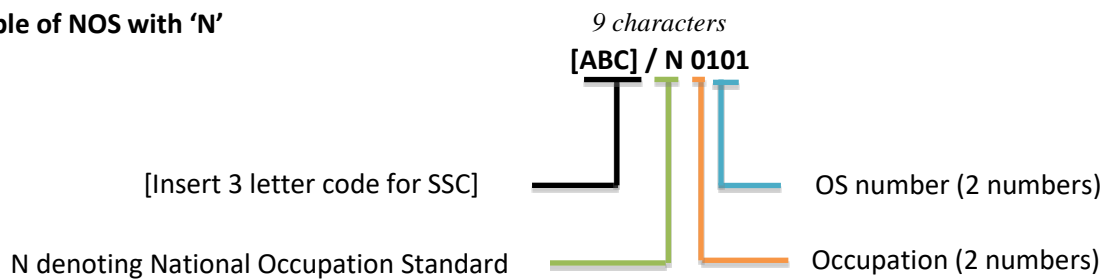
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with ‘N’



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Qualification Pack for “Rooftop Solar Photovoltaic Entrepreneur”

The following acronyms/codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Solar Photovoltaic	01-05
Solar Thermal	06-10
Wind	11-15
Hydro	16-20
Biomass	21-25
Geothermal	26-30
All Renewables (Cross-cutting/ Enabling Activities)	31-35
Alternative Fuel Transportation	36-40
Bio-fuels and Farming	40-45
Environmental Compliance and Sustainability Planning	46-50
Green Buildings	51-55
Energy Efficiency	56-60
Waste Management	61-65
Water and Wastewater Management	66-70
Co-generation	71-75
Other Green Jobs	76-99

Sequence	Description	Example
Three letters	Industry name	SGJ
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

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Qualification Pack for “Rooftop Solar Photovoltaic Entrepreneur”

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Rooftop Solar Photovoltaic Entrepreneur

Qualification Pack SGJ/Q0104

Sector Skill Council Green Jobs

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack

NOS	Performance Criteria	Marks Allocation			
		Total Mark	Out Of	Theory	Skills Practical
SGJ/N0108 Carry out Market Research and prepare a cost estimate for a Rooftop Solar Photovoltaic Plant	PC1. Select the right quality of solar module by identifying the key technical parameters in data Specification Sheets.	55	5	2	3
	PC2. Select the right quality of Inverter by identifying the key technical parameters in data Specification Sheets.		5	2	3
	PC3. Select the right quality of Mounting Structure by identifying the key technical parameters in data Specification Sheets.		5	2	3
	PC4. Select the right quality of battery by identifying the key technical parameters in data Specification Sheets.		5	2	3
	PC5. Select the balance of system by identifying the key technical parameters in data Specification Sheets.		5	2	3
	PC6. Identify market price of different components of Solar PV system.		3	1	2
	PC7. Prepare an estimate for a solar project		3	1	2
	PC8. Prepare a cost benefit analysis for a rooftop solar PV plant.		7	3	4
	PC9. Identify different business models in solar rooftop Sector		7	3	4
	PC10. Identify the policy, regulations and procedures for solar rooftop sector in the local market.		10	4	6
	TOTAL	55	22	33	



SGJ/ Q0104 Qualification Pack for “Rooftop Solar Photovoltaic Entrepreneur”

SGJ/N0109 Prepare site feasibility study report.	PC1. Identify optimum location of Installations	65	3	1	2
	PC2. Assess the site level pre-requisites for solar panel installation		10	4	6
	PC3. Decide on the type of mounting to be constructed and place of mounting as per client requirement.		4	2	2
	PC4. Check for any shading obstacles		3	1	2
	PC5. Prepare a site map of the location where installation has to be carried out.		3	1	2
	PC6. Assess the load to be run on Solar PV power plant and prepare a load profile.		3	1	2
	PC7. Estimate the capacity of Solar PV power plant		5	2	3
	PC8. Decide on battery backup as per grid availability, loads and client expectation		5	2	3
	PC9. Assess or Obtain the site specific major parameters of solar resource data like GHI, DNI, Temperature and Wind.		3	1	2
	PC10. Perform shading analysis		5	2	3
	PC11. Estimate the energy generated from the rooftop solar PV power plant using software like PV*SOL®, PVSYST, ETC.		10	3	7
	PC12. Identify the risks associated with the specific solar project.		5	2	3
	PC13. Prepare a site feasibility study report.		6	3	3
	TOTAL	65	25	40	
SGJ/N0110 Manage Solar PV Project lifecycle	PC1. Read and interpret the single line diagram, Civil / Mechanical drawings and Electrical drawings.	100	7	3	4
	PC2. Read and interpret the bill of material.		5	2	3
	PC3. Calculate the lifecycle cost of a rooftop solar project using softwares like Excel, PV*SOL®, PVsyst, etc.		10	4	6
	PC4. Identify and mitigate various risks associated with project.		15	5	10
	PC5. Ensure the solar PV system and structure meets the local government and regulatory requirements.		5	2	3
	PC6. Coordinate with Design team to get the bill of materials and drawings.		2	1	1
	PC7. Coordinate with the supplier for timely delivery of components.		3	1	2
	PC8. Ensure arrangement of skilled technicians and engineers for installation.		10	4	6
	PC9. Prepare a draft project activity implementation plan.		10	4	6
	PC10. Coordinate with supervisor at client’s side to ensure timely implementation of project to avoid any cost overrun.		3	1	2
	PC11. Identify the maintenance activity required for a rooftop solar PV power plant components.		10	4	6
	PC12. Prepare a preventive maintenance schedule		3	3	5
	PC13. Ensure Proper Cleaning of Solar Panels		10	2	3



SGJ/ Q0104 Qualification Pack for “Rooftop Solar Photovoltaic Entrepreneur”

	PC14. Ensure Regular inspection of the solar PV system and rectify the faults.		8	3	4
			100	39	61
SGJ/N0111 Entrepreneurship Skills	PC1. Describe the process for setting up a new venture	100	8	4	4
	PC2. Identify the key ingredients of a business plan		12	5	7
	PC3. Distinguish between fixed and working capital requirements		8	3	5
	PC4. Describe the components of a loan application for fund raising		8	4	4
	PC5. Demonstrate good Etiquettes and manners while communicating with the client		8	4	4
	PC6. Demonstrate the importance of time management		8	4	4
	PC7. Demonstrate leadership skills and effective resource management techniques		8	4	4
	PC8. Demonstrate the use of MS word and MS excel for preparing a proposal		10	4	6
	PC9. Prepare a workable presentation for marketing and business development		10	4	6
	PC10. Choose the right buyer in a given situation of market parameters		10	4	6
	PC11. Identify the challenges and risks for new entrepreneurs and the possible mitigation measures		10	5	5
	TOTAL		100	45	55
SGJ/N0106 Maintain Personal Health & Safety at project site	PC1. Identify corporate policies required for workplace safety.	50	2	1	1
	PC2. Identify requirements for safe work area and create a safe work environment.		3	2	1
	PC3. Identify contact person when workplace safety policies are violated.		1	1	0
	PC4. Provide information about incident/violation.		1	1	
	PC5. Identify the location of First Aid materials and administer first aid		2	1	1
	PC6. Identify the personal protection equipment required for specific locations on-site		3	2	1
	PC7. Identify expiry dates and wear & tear issues of specified equipment.		2	1	1
	PC8. Demonstrate safe and accepted practices for personal protection.		3	2	1
	PC9. Identify environmental hazards associated with the project site.		2	1	1
	PC10. Identify electrical hazards.		4	2	2
	PC11. Identify personal safety hazards or work site hazards and Mitigate hazards.		4	2	2
	PC12. Select tools, equipment and testing devices needed to carry out the work.		4	2	2
	PC13. Demonstrate safe and proper use of required tools and equipment.		4	2	2
	PC14. Check access from ground to work area to ensure it is safe and in accordance with requirements.		2	1	1



SGJ/ Q0104

Qualification Pack for “Rooftop Solar Photovoltaic Entrepreneur”

	PC15. Reassess risk control measures, as required, in accordance with changed work practices and/or site conditions and undertake alterations.		2	2	0
	PC16. Inspect/install fall protection and perimeter protection equipment ensuring adequacy for work and conformance to regulatory requirements.		4	2	2
	PC17. Identify approved methods of moving tools and equipment to work area and minimize potential hazards associated with tools at heights		2	1	1
	PC18. Select and install appropriate signs and barricades		2	1	1
	PC19. Place tools and materials to eliminate or minimize the risk of items being knocked down.		1	1	
	PC20. Dismantle Plant safely in accordance with sequence and remove from worksite to clear work area.		2	1	1
		Total	50	29	21