



ASSESSMENT MATERIAL EVIDENCE GUIDE	<h1>ENERGY EFFICIENCY ADVISOR</h1>
Qualification Energy Efficiency Advisor CS Code: Level: 5 Credit: 95 Version: 1	

CONTENTS	1. Assessment Summary and Record 2. Candidate Assessment 3. Assessor Judgment Guide 4. List of required tools/equipment, material and context of assessment
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ASSESSMENT AND ASSESSOR DETAILS	Competent <input type="checkbox"/> Not Yet Competent <input type="checkbox"/>																		
	Assessment <input type="checkbox"/> Re-Assessment <input type="checkbox"/>																		
	Assessor's Name Assessor's Code Assessor's Signature Date <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> <tr> <td style="text-align: center; font-size: 8px;">DD</td> <td style="text-align: center; font-size: 8px;">MM</td> <td colspan="6"></td> <td style="text-align: center; font-size: 8px;">YYYY</td> </tr> </table>											DD	MM						
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CANDIDATE DETAILS	Candidate's Name <small style="display: flex; justify-content: space-between; width: 100%;"> First Name Last Name </small>																				
	Father's Name																				
	Institute Name and District																				
	CNIC/BFORM # <table border="1" style="display: inline-table; border-collapse: collapse; width: 150px; height: 20px;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table>																				
	Registration Number issued by Assessment Body																				
Gender Male <input type="checkbox"/> Female <input type="checkbox"/> Transgender <input type="checkbox"/>																					
Candidate's Consent I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal. Candidate's Signature																					

ASSESSMENT RESULTS SUMMARY FORM	You can use this coversheet as an <i>Assessment Results Summary Form</i> . Simply post a photocopy of this completed coversheet to NAVTTCC
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NAVTTCC OFFICE ONLY	1. DATE FORM RECEIVED: <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> <tr> <td style="text-align: center; font-size: 8px;">DD</td> <td style="text-align: center; font-size: 8px;">MM</td> <td colspan="4"></td> <td style="text-align: center; font-size: 8px;">YYYY</td> </tr> </table>									DD	MM					YYYY	2. DATE ENTERED INTO DATABASE: <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> <tr> <td style="text-align: center; font-size: 8px;">DD</td> <td style="text-align: center; font-size: 8px;">MM</td> <td colspan="4"></td> <td style="text-align: center; font-size: 8px;">YYYY</td> </tr> </table>									DD	MM					YYYY
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ASSESSMENT SUMMARY & RECORD

ACTIVITY	METHOD				DESIRED OUTCOMES	RESULT	
	WRITTEN	ORAL	PORTFOLIO	OBSERVATION		COMPETENT	NOT YET COMPETENT
NATURE OF ACTIVITY					DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: PREPARE TO CARRY OUT HVAC WORK		
Practical Skill Demonstration				✓	<ul style="list-style-type: none"> • Prepare a project proposal as per TORs • Conduct energy review of the company • Advise on developing company energy policy and strategies • Monitor the energy performance of the Company • Develop Workforce Competencies of the Company 		
Knowledge Assessment	✓	✓			<ul style="list-style-type: none"> • Answer all questions your assessor may have during the practical assessment 		
Other Requirements			✓		<p>Provide verified evidence of following;</p> <ul style="list-style-type: none"> • Energy Efficiency or Energy Management Project Proposal and Signed contract with a company • Report of energy review of the company • Documentation of company energy policy and strategies • Energy performance monitoring report • Develop Workforce Competencies of the Company 		

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CANDIDATE ASSESSMENT

Candidate's Name.....Father's Name

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following tasks within **3hrs.00 min** timeframe:

- Prepare a project proposal as per TORs
- Conduct energy review of the company
- Advise on developing company energy policy and strategies
- Monitor the energy performance of the Company
- Develop Workforce Competencies of the Company

ACTIVITIES	CANDIDATE RESPONSE
<p>1. Complete practical task of Energy Efficiency Advisor under observation by an assessor</p>	<p>During a practical assessment, under observation by an assessor, I will correctly :</p> <ul style="list-style-type: none"> • Demonstrate use of any of the following equipment necessary to conduct energy review as per assessor choice <ul style="list-style-type: none"> ○ Demonstrate use of Energy Analyser <ul style="list-style-type: none"> ✓ Attach Current Transformer and Voltage probes with analyser ✓ Select proper C.T. and attach to load ✓ Configure time interval, sample rate, range, direction to measure energy ✓ Measure data and save it ✓ Interpret and make graph of measured data ○ Demonstrate use of Thermal Imager <ul style="list-style-type: none"> ✓ Select appropriate emissivity ✓ Set reflected apparent temperature ✓ Set temperature range ✓ Focus the object and take image ✓ Download the image on PC and apply basic tools to investigate the image ○ Demonstrate use of Emission Gas Analyser <ul style="list-style-type: none"> ✓ Set and analyse for appropriate gases ✓ Set a probe at appropriate point of reading ✓ Measure the reading ✓ Download on PC and get the result ○ General Requirements <ul style="list-style-type: none"> ✓ Pack and unpack equipment appropriately ✓ Connect equipment correctly ✓ Check battery ✓ Check memory card ✓ Follow OHS for using the equipment • Prepare energy policy as per provided case study (APPENDIX I) to: <ul style="list-style-type: none"> ✓ Ensure appropriate nature and scale of organization's energy use and consumption ✓ Commit continual improvement in energy performance ✓ Commit to ensure the availability of information and of necessary resources to achieve objectives and targets ✓ Commit to comply with applicable legal requirements and with other requirements to which the organization subscribes which relate to its energy use, consumption, and efficiency ✓ Provide framework for setting and reviewing energy objectives and targets ✓ Ensure purchase of energy efficient products and services and design for energy performance improvement • Develop a measurement plan for monitoring the energy performance as per case study provided by assessor (APPENDIX II) <ul style="list-style-type: none"> ✓ Identify Significant Energy Users (SEUs) of the company ✓ Determine the data requirements for monitoring of energy performance indicators of SEUs

	<ul style="list-style-type: none"> ✓ Identify locations for data collection as per data requirements ✓ Identify measurement equipment with specifications as per data requirements and identified locations ✓ Define appropriate EnPIs for SEUs
<p>2. Other requirements</p>	<ul style="list-style-type: none"> • Provide Verified evidence of a project proposal including following; <ul style="list-style-type: none"> ✓ Interpret requirements as per project ✓ Market research limited to project scope for assessing your organisational capabilities ✓ Estimation of resources and their costs <ul style="list-style-type: none"> ▪ Human resources ▪ Man Hours ▪ Tools and equipment ▪ Logistics ▪ Material consumables ▪ Project time ✓ Roles and responsibilities of parties in the contract as per project requirement • Provide verified evidence of analysis of energy use and consumption of company including following. <ul style="list-style-type: none"> ✓ Data requirement to initiate energy review, after understanding process flow ✓ Identified data sources and communicate to relevant departments for data collection and collect data, as per available resources ✓ Data measurement requirement and identify measurement points for required data ✓ Occupation Health & Safety (OHS) requirement for data measurement ✓ Compilation of the measured data for further analysis ✓ Process flow analysis using collected and measured data ✓ Energy and mass balance with in project boundaries ✓ Patterns and areas with significant energy consumption of organization ✓ Calculation of the costs of energy • Provide verified evidence of documented EnPIs and their baseline for the company • Provide verified evidence of identification of potential areas of improvement in the company including following. <ul style="list-style-type: none"> ✓ Calculation of the efficiency of significant energy users, with in project scope ✓ Analysis of internal and external energy performance and gaps between baseline benchmarks ✓ Targets for energy performance for significant energy users • Provide verified evidence of documented energy policy for the company including following. <ul style="list-style-type: none"> ✓ Energy policy and objective outline based on the given data (case study). ✓ Methodology for periodically reviewing and updating energy policy, objectives and energy performance. • Provide verified evidence of energy action plan including following. <ul style="list-style-type: none"> ✓ Option for energy improvement. ✓ Calculation of improvement potential for each option. ✓ Criteria for prioritization of identified energy performance improvement options and make a comparison among them. ✓ Calculation of the required resources for energy performance improvement option (e.g. HR, finance, time). • Provide verified evidence of monitoring effectiveness of action plan of the company including following <ul style="list-style-type: none"> ✓ Calculation of energy savings of implemented actions as per action plan ✓ Gap analysis of proposed and actual energy saving of implemented actions ✓ Impact assessment of realized saving on Energy Performance Indicators ✓ Recommendations for corrective and preventive measures to mitigate gaps identified in gap analysis • Provide verified evidence of executing training plan based on need assessment and evaluate its effectiveness including following. <ul style="list-style-type: none"> ✓ Training need assessment report ✓ Training plan based on need assessment. ✓ Progress review of implementation for trainings against designed plan ✓ Criteria for evaluation of trainings as per training need assessment (TNA) ✓ Analysis of effectiveness of trainings based on results of evaluation and recommends the improvements.

3. Answer any questions your assessor may have during the practical assessment

My answers to questions are correct and demonstrate my understanding of the topics and their application.

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ASSESSOR JUDGEMENT GUIDE

Candidate's Name Father's Name.....

INSTRUCTIONS FOR ASSESSOR

This section contains minimum evidence requirements. Oral questioning may be used to clarify candidate understanding of the topic and its application.

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES	NO	ASSESSOR COMMENTS
1. Complete practical task of Monitor Energy Performance Of The Company under observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out the following tasks:			
Demonstrate use of any of the following equipment necessary to conduct energy review as per assessor choice	Demonstrated use of Energy Analyser <ul style="list-style-type: none"> ✓ Attach Current Transformer and Voltage probes with analyser ✓ Select proper C.T. and attach to load ✓ Configure time interval, sample rate, range, direction to measure energy ✓ Measure data and save it ✓ Interpret and make graph of measured data 			
	Demonstrated use of Thermal Imager <ul style="list-style-type: none"> ✓ Select appropriate emissivity ✓ Set reflected apparent temperature ✓ Set temperature range ✓ Focus the object and take image ✓ Download the image on PC and apply basic tools to investigate the image 			
	Demonstrated use of Emission Gas Analyser <ul style="list-style-type: none"> ✓ Set and analyse for appropriate gases ✓ Set a probe at appropriate point of reading ✓ Measure the reading ✓ Download on PC and get the result 			
	General Requirements <ul style="list-style-type: none"> ✓ Pack and unpack equipment appropriately ✓ Connect equipment correctly ✓ Check battery ✓ Check memory card ✓ Follow OHS for using the equipment 			
Prepare energy policy as per provided case study	Ensured appropriate nature and scale of organization's energy use and consumption			
	Committed to continual improvement in energy performance			
	Committed to ensure the availability of information and of necessary resources to achieve objectives and targets			
	Committed to comply with applicable legal requirements and with other requirements to which the organization subscribes which relate to its energy use, consumption, and efficiency			
	Provided framework for setting and reviewing energy objectives and targets			
	Ensured purchase of energy efficient products and services and design for energy performance improvement			

Develop a measurement plan for monitoring the energy performance as per case study provided by assessor	Identified Significant Energy Users (SEUs) of the company			
	Determined the data requirements for monitoring of energy performance indicators of SEUs			
	Identified locations for data collection as per data requirements			
	Identified measurement equipment with specifications as per data requirements and identified locations			
Defined appropriate EnPIs for SEUs				
2. Other requirements				
	<p>Provided Verified evidence of a project proposal including following;</p> <ul style="list-style-type: none"> ✓ Interpret requirements as per project ✓ Market research limited to project scope for assessing your organisational capabilities ✓ Estimation of resources and their costs <ul style="list-style-type: none"> ▪ Human resources ▪ Man Hours ▪ Tools and equipment ▪ Logistics ▪ Material consumables ▪ Project time ✓ Roles and responsibilities of parties in the contract as per project requirement 			
	<p>Provided verified evidence of analysis of energy use and consumption of company including following.</p> <ul style="list-style-type: none"> ✓ Data requirement to initiate energy review, after understanding process flow ✓ Identified data sources and communicate to relevant departments for data collection and collect data, as per available resources ✓ Data measurement requirement and identify measurement points for required data ✓ Occupation Health & Safety (OHS) requirement for data measurement ✓ Compilation of the measured data for further analysis ✓ Process flow analysis using collected and measured data ✓ Energy and mass balance with in project boundaries ✓ Patterns and areas with significant energy consumption of organization ✓ Calculation of the costs of energy 			
	Provided verified evidence of documented EnPIs and their baseline for the company			
	<p>Provide verified evidence of identification of potential areas of improvement in the company including following.</p> <ul style="list-style-type: none"> ✓ Calculation of the efficiency of significant energy users, with in project scope ✓ Analysis of internal and external energy performance and gaps between baseline benchmarks ✓ Targets for energy performance for significant energy users 			
	<p>Provided verified evidence of documented energy policy for the company including following.</p> <ul style="list-style-type: none"> ✓ Energy policy and objective outline based on the given data (case study). ✓ Methodology for periodically reviewing and updating energy policy, objectives and energy performance. 			

	<p>Provided verified evidence of energy action plan including following.</p> <ul style="list-style-type: none"> ✓ Option for energy improvement. ✓ Calculation of improvement potential for each option. ✓ Criteria for prioritization of identified energy performance improvement options and make a comparison among them. ✓ Calculation of the required resources for energy performance improvement option (e.g. HR, finance, time). 			
	<p>Provided verified evidence of monitoring effectiveness of action plan of the company including following</p> <ul style="list-style-type: none"> ✓ Calculation of energy savings of implemented actions as per action plan ✓ Gap analysis of proposed and actual energy saving of implemented actions ✓ Impact assessment of realized saving on Energy Performance Indicators ✓ Recommendations for corrective and preventive measures to mitigate gaps identified in gap analysis 			
	<p>Provided verified evidence of executing training plan based on need assessment and evaluate its effectiveness including following.</p> <ul style="list-style-type: none"> ✓ Training need assessment report ✓ Training plan based on need assessment. ✓ Progress review of implementation for trainings against designed plan ✓ Criteria for evaluation of trainings as per training need assessment (TNA) ✓ Analysis of effectiveness of trainings based on results of evaluation and recommend the improvements 			

3. Answer any questions the assessor may have during the practical assessment

Candidate's answers to questions are correct and demonstrate understanding of the topics and their application.

Assessor to document below all questions asked and candidate answers. Use extra sheets if required and attach.

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LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

INSTRUCTIONS	<p>This section contains information regarding;</p> <ul style="list-style-type: none"> Context of the assessment List of required tools and equipment. List of consumable items required during the service
1. Context of Assessment	This task will be performed in real time/simulated environment.

2. List of tools and equipment required(for five candidates)		
S. No	Items	Quantity
1	Calculator	1
2	Energy Analyser	1
3	Thermal Imager	1
4	Emission Analyser	1
5	Ultrasonic leakage detector	1
6	pH meter	1

3. List of consumable items required(for five candidates)		
S. No	Items	Quantity
1	Pen	5
2	Printed case studies	5
3	Notebook	5

APPENDIX I

CASESTUDY FOR ENERGY POLICY

Note: This is a sample casestudy assessor may provide another casestudy accordingly.

You as an energy efficiency advisor are invited by the knitwear garments manufacturing company. The director introduced the processes involved in preparation of garments. Director said, "Beautiful colors - a medium sized textile company, is producing export quality knitwear. Pre-treatment of grey fabric is the first step of the process, requires approximately 30 % of the specific energy of the product. Then followed by dyeing and finishing having 20 % share of specific energy consumption. After dyeing and finishing, fabric is cut and stitched as per buyer requirement and then packed and dispatched". He adds, "Stitching and packaging are not very energy intensive processes. We are planning to setup a new stitching plant adjacent to the existing one, and definitely all pre-processes will also be the part of the plan. We are planning to implement the energy management system, but definitely we will do that in steps. In the first step we will implement this in our existing factor. You asked him what the specific energy consumption of the company is. 3.02 Kwh/kg, he replied.

You inquired about any audit conducted by the company? He said, "Yes we hired an Energy Auditing company. As per report, there is 30 % saving potential in boiler operation, 20 % in compressed air system and 50 % in lighting system and 10 % in oil heaters. They also suggested that about 20 % of the water consumption can also be reduced in the dyeing process that will contribute 10 % reduction of specific energy consumption of the factory."

You asked, "How much %age of steam, compressed air, lights and heated oil used in pre-treatment process?"

He replied, as per our data, 50 % of steam, 20 % compressed air 10 % lighting, and 5% heated oil is used in this department.

The company is located at 125 A, SITE Karachi, near a shared waste water treatment plant. Increasing water pollution in the waste water drains is the issue for municipality. Local Govt. is thinking to take serious action to cater the problem.

Now it is your assignment to develop energy policy for this company as per standard requirements.

APPENDIX II

CASESTUDY FOR DEVELOPING MEASUREMENT PLAN FOR MONITORING ENERGY PERFORMANCE

Note: This is a sample casestudy assessor may provide another casestudy accordingly.

A textile spinning unit M/S Strong Yarns, expanded their facilities by erecting a new plant in Quaid e azam industrial state Lahore, but the management is much concerned with energy consumption due to high rates. The sanctioned load of company from LESCO is 2500kW. There is 1 spinning unit of 20000 spindles having 1.5MW, producing 1750 lbs. in 24 hours. There is a yarn dying section having 3 units of each 100kW dying 750 kgs in 24 hrs. Company has a coal fired boiler of 5TPH and two compressors of 250kW and 120kW for pneumatic operations producing 1700cfm of air. Repair and maintenance shop has load 50kW. Management decided to monitor the energy consumption for the service and production cost. HR/Admin and finance department have 15kW x 6 chillers and lighting system of 135kW and other equipment of 50kVA. The company has stand by diesel generators of 500kVA and 1500 kVA and are synchronized consumes 150 ltrs per hours on average and average load of 1050 kW.

Suggest company a monitoring plan that helps them to achieve their purpose and as the machines and equipment having power more than 100kW covers the 75% of energy consumption and rest of machines are 25%. In first phase management decided to cater 75% energy consumers and all utilities.