

ANNEX A

COMPETENCY STANDARDS FOR ENERGY CONSERVATION OFFICERS (ECO)

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**COMPETENCY STANDARDS FOR
ENERGY EFFICIENCY AND CONSERVATION LEVEL III**

The **Competency Standards of ECO** consist of competencies that a Candidate must achieve to be able to demonstrate competence, proficiency, and ethical fitness in energy management specifically for the supervision and maintenance of the facilities of Types 1, 2, and 3 designated establishments in the proper management of energy consumption of facilities, equipment and devices for efficient and judicious utilization of energy.

The units of competency comprising this qualification include the following:

Code	CORE COMPETENCIES
UTL741323	Manage Energy Consumption of Facilities, Equipment, and Devices
UTL741324	Plan and Support the Implementation of Regular Energy Audit
UTL741325	Perform Energy Consumption Monitoring and Control
UTL741326	Carry-out Implementation and Improvement of Energy Efficiency Measures
UTL741327	Coordinate inventories and purchasing/sourcing of energy. efficient equipment or devices
UTL741328	Install, operate, and maintain energy-consuming machines. and equipment in facilities
UTL311208	Apply Energy Management System Standards

Competency Standards

This section gives the details of the contents of the competencies required for Energy Efficiency and Conservation Level III.

UNIT OF COMPETENCY: **MANAGE ENERGY CONSUMPTION OF FACILITIES, EQUIPMENT AND DEVICES**

UNIT CODE : **UTL741323**

DESCRIPTOR : This unit covers the knowledge, skills and attitude required to provide an appropriate management of energy consumption in the facility and its corresponding equipment and devices. This unit includes competencies in checking current energy consumption of facilities, equipment, and devices; checking appropriate ways to prevent energy consumption increase; performing modification and improvement of settings, processes and behaviors and conducting management review on energy performance.

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Check current energy consumption of facilities, equipment, and devices	1.1 Energy consuming facilities, equipment and devices are identified based on assets list, electrical, mechanical and as-built plan of the premises 1.2 Energy consumption of the facilities, equipment and devices are measured and properly reported. * 1.3 High energy consumption detection is recorded according to company SOP. *	1.1. Usage of energy measuring devices 1.2. Identification of types of energy consuming equipment and devices and their specifications 1.3. Application and usage of equipment and devices 1.4. Analysis of Electrical and mechanical plans 1.5. Familiarization with Energy Consumption measurement procedures 1.6. Basic Math (MDAS) 1.7. Written and oral communication	1.1. Using energy measuring instruments 1.2. Technical writing skills 1.3. Identifying energy consuming equipment and devices 1.4. Analytical skills 1.5. Communication skills 1.6. Interpretation skills 1.7. Mathematical skills
2. Check appropriate ways to manage energy consumption and improve efficiency	2.1 Specifications of equipment and devices performance are verified and familiarized based on specifications. 2.2 Phantom loads, overheating and	2.1 Up-to-date knowledge of energy efficient technologies 2.2 Energy equipment and devices actual performance versus standards or benchmarks	2.1 Detecting and managing proper usage of facilities, equipment, and devices 2.2 Using instrumentation for measuring

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	building envelope are checked according to <i>technical reference standards.</i> * 2.3 Equipment and devices modification, retrofit, upgrade and similar action are verified against existing <i>energy efficiency reference standards.</i> * 2.4 Standard usage of facilities, equipment and devices are checked and observed and including the entire processes and control settings.	2.3 Procedures in checking phantom loads, overheating and building envelope. 2.4 Different energy efficiency reference standards in energy consumption Procedures in modification, retrofitting and upgrading energy equipment and devices. 2.5 Detection and management of proper use of facilities, equipment, and devices 2.6 Production and operation processes and control settings	energy consumption 2.3 Communication skills 2.4 Interpretation skills 2.5 Mathematical skills
3. Perform modification and improvement of settings, processes, and behaviors	3.1 Safety protocols are observed based on OSHA. * 3.2 Analysis and recommendations are made on identified high energy consumption use. 3.3 Proper modification and improvement of processes/settings and behavior are reviewed and analyzed following standards requirements prior to implementation. * 3.4 Implemented changes are monitored versus change objectives and reported regularly	3.1 Safety protocols/ OSHA 3.2 Production and operation processes and control settings 3.3 Correct and safe modification of energy efficient devices/ equipment 3.4 Proper usage of basic electrical and mechanical tools	3.1 Analytical skills 3.2 Using basic electrical and mechanical tools properly 3.3 Communication skills 3.4 Interpretation skills

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Conduct management review on energy performance	4.1 Energy performance plans versus targets are evaluated according to EnMS. * 4.2 Performance review and necessary function testing are conducted based on operational and testing procedures. * 4.3 Deviations, non-conformance are identified based on established targets and objectives. * 4.4 Action plans to improve performance are recommended based on EnMS	4.1 Familiarity with the operating performance of the installed equipment 4.2 Understanding of the systems performance for all related equipment. 4.3 Company's energy policy, process, and procedures on EnMS	4.1 Interpretation and analysis of data. 4.2 Using energy related instrument (e.g. clamp meter)

* *Critical Aspects of Competency*

RANGE OF VARIABLES

VARIABLE	RANGE
1. Energy consumption report	Energy consumption reporting may include: 1.1. Calculations 1.2. Tabulations 1.3. Graphs 1.4. Data collection
2. High energy consumption detection	High energy consumption detection may include: 2.1. Phantom loads detection 2.2. Overheating/over-used detection 2.3. Energy bill 2.4. Consumption data trends
3. Technical reference standards	Technical reference standards may include: 3.1. efficient lighting standards 3.2. Philippine Electrical Code 3.3. Philippine Mechanical Code 3.4. Guidelines for Energy Conserving Designs for Buildings 3.5. Green Building Code 3.6. Energy Efficiency related policies and department circulars of DOE 3.7. Fire Code of the Philippines 3.8. OSHA 3.9. ASHRAE 3.10. Environmental Code
4. Energy efficiency reference standards	Energy efficiency reference standards may include: 4.1. Guidelines for Energy Conserving Designs for Buildings 4.2. Green Building Code 4.3. Energy Efficiency related policies and department circulars of DOE 4.4. OSHA 4.5. ASHRAE 4.6. ISO 50001

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Checked current energy consumption of facilities, equipment, and devices. 1.1.1. Measured and properly reported Energy consumption of the facilities, equipment, and devices. 1.1.2. Recorded high energy consumption detection according to company SOP. 1.2. Checked appropriate ways to prevent energy consumption increase. 1.2.1. Checked phantom loads, overheating, and building envelope according to reference standards. 1.2.2. Verified equipment and devices modification, retrofit, upgrade and similar action against existing energy efficiency reference standards. 1.3. Performed modification and improvement of settings, processes and behaviors. 1.3.1. Observed safety protocols based on OSHA. 1.3.2. Reviewed and analyzed proper modification and improvement of processes/settings and behavior following standards requirements 1.4. Conducted management review on energy performance. 1.4.1. Evaluated energy performance plans versus targets according to EnMS. 1.4.2. Conducted performance review and necessary function testing based on Energy Management System (EnMS) 1.4.3. identified deviations, non-conformance based on established targets and objectives
2. Resource implications	The following resources should be provided: 2.1. Appropriate energy measuring equipment and tools. 2.2. Applicable PPE 2.3. Appropriate assessment resources 2.4. Workplace or assessment area 2.5. Legislation, policies, procedures, protocol, and local ordinances relating to energy utilization
3. Method of assessment	Competency in this unit may be assessed through: 3.1. Demonstration/Observation with oral questioning 3.2. Written test 3.3. Portfolio
4. Context of assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY:

PLAN AND SUPPORT THE IMPLEMENTATION OF
REGULAR ENERGY AUDIT

UNIT CODE

:

UTL741324

DESCRIPTOR

:

This unit covers the knowledge, skills and attitude required to conduct regular energy audit. This unit also includes planning & scheduling and implementing energy audit including developing and recommending strategies for improving energy audit.

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and schedule energy audit	1.1. Audit team is developed through capability building methods . 1.2. Audit plan is prepared based on coordination with different divisions/plants. * 1.3. Final schedule for resource requirements is approved and communicated. *	1.1. Energy audit methodology, principles, process, guidelines, and procedures 1.2. Facilities production and operation processes and boundaries 1.3. Energy equipment devices specifications 1.4. Scope of an Energy Audit 1.5. Knowledge of Resources requirement 1.6. Selection of Audit method based on recognized need	1.1. Analytical skills 1.2. Communication skills 1.3. Writing/reporting skills 1.4. Coordination and team management skills 1.5. Identifying list of data to be collected. 1.6. Operate metering equipment. 1.7. Identifying area to be audited
2. Implement energy audit	2.1. Meeting is conducted in accordance with the energy audit plan. * 2.2. Data collection and measurement plan are implemented based on the energy audit plan.* 2.3. Site inspection is conducted based on energy audit plan. 2.4. Data are analyzed using simple statistical tools and energy auditing techniques. * 2.5. Reporting and closing are done based on energy audit plan.	2.1. Energy audit methodology, principles, process, guidelines, and procedures 2.2. Facilities production and operation processes and boundaries 2.3. Energy equipment devices specifications 2.4. Knowledge about setting of Energy Target and Plan 2.5. Analysis of result 2.6. Estimates of manpower and budget required.	2.1. Analytical skills 2.2. Communication skills 2.3. Writing/reporting skills 2.4. Coordination and team management skills 2.5. Identifying area or equipment to be included in the Audit. 2.6. Ensuring complete metering and instrumentation needed

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.6. Conduct of audit are monitored up to closing meeting and made sure audit plan is followed within the time frame	2.7. External auditors' proper credentials and track record.	
3. Develop and recommend strategies for improving energy efficiency	3.1. Strategies are developed based on the outcome of the audit findings. * 3.2. Recommendation for energy use reduction or energy efficiency improvement strategy is prepared based on the results of the audit. * 3.3. Recommendation for opportunities for improvement is proposed based on the results of the audit. *	3.1. Energy audit methodology, principles, process, guidelines, and procedures 3.2. Facilities production and operation processes and boundaries 3.3. Energy equipment devices specifications 3.4. target energy reduction check audit recommendations. 3.5. Assessment on identified opportunities for improvement	3.1. Analytical skills 3.2. Communication skills 3.3. Writing/ reporting skills 3.4. Coordination and team management 3.5. Presentation skills 3.6. Assisting Audit team and provide needed metering equipment and instrumentation

* Critical Aspects of Competency

RANGE OF VARIABLES

VARIABLE	RANGE
1. Capability building methods	May include: 1.1. training and seminars 1.2. mentoring 1.3. consulting or hiring third party. 1.4. outsourcing
2. Resource requirements	May include: 2.1. manpower 2.2. equipment 2.3. budgets
3. Analyzed	May include: 3.1. data analysis and presentation outputs: 3.2. identify energy performance trends, 3.3. issues and performance gaps, 3.4. opportunities for improvement
4. Measure actual use of energy	May include: 4.1. Specific energy consumption (kWh or equivalent) 4.2. Operating Hours 4.3. Energy Baseline Consumption 4.4. Energy baseload 4.5. Energy Efficiency Index (EEI) 4.6. Seasonal variability
5. Strategies	Development of strategies may include: 5.1. Conduct of Level 1 Energy Audit to establish baseline. 5.2. Determine actual energy use for the overall process. 5.3. Identification of Energy Conserving Measures (ECM) 5.4. Applying fuel substitution when applicable 5.5. Analysis of process, operation, and control setpoints 5.6. Policies and behavioral analysis 5.7. Identification of energy efficient technologies
6. Recommendation	Recommendation for an energy efficiency improvement strategy may include: 6.1. Process and operation control analysis. 6.2. Cost-benefit analysis 6.3. Life Cycle Analysis 6.4. Consideration for downtime

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Plan and schedule energy audit. 1.1.1. Prepared audit plan based on coordination with different divisions/plants. 1.1.2. Approved and communicated final schedule for resource requirements. 1.2. Implement energy audit. 1.2.1. Conducted meeting is conducted in accordance with the energy audit plan. 1.2.2. Implemented data collection and measurement plan based on the energy audit plan. 1.2.3. Analyzed data using statistical tools and techniques. 1.3. Develop and recommend strategies for improving energy efficiency. 1.3.1. Developed strategies based on the outcome of the audit findings. 1.3.2. Prepared recommendation for energy use reduction strategy based on the results of the audit. 1.3.3. Proposed recommendation for opportunities for improvement based on the results of the audit
2. Resource Implications	The following resources should be provided: 2.1. Appropriate energy measuring equipment. 2.2. Applicable PPE 2.3. Appropriate energy audit tools 2.4. Workplace or assessment area: actual place of audit
3. Method of assessment	Competency in this unit may be assessed through: 3.1. Demonstration/Observation with oral questioning 3.2. Written test 3.3. Portfolio
4. Context of assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY:

PERFORM ENERGY CONSUMPTION MONITORING AND CONTROL

UNIT CODE

:

UTL741325

DESCRIPTOR

:

This unit covers the outcomes required for performing energy monitoring and control. This unit includes competencies in conducting data gathering, using measuring tools and instrument panel for monitoring, and analyzing the energy consumption data.

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Conduct data gathering	1.1. Checklists and forms are prepared based on required/needed information. 1.2. Data for energy consumption are gathered based on checklist and forms. * 1.3. Data are properly recorded, documented, and stored for future analysis. *	1.1. Understanding of set points parameter 1.2. Understanding on the use of test and measuring equipment and devices 1.3. Facilities electrical and mechanical plans 1.4. Basic Statistics	1.1. Reading and understanding of units of measurements 1.2. data gathering skills. 1.3. documentation skills 1.4. communication skills
2. Use measuring tools and Instrument Panel for monitoring	2.1. Measuring tools and instrument panel are prepared for energy consumption monitoring. 2.2. Measuring tools and instrument panel are used to compared standards versus actual parameters. *	2.1 Understanding of analog and digital instrumentation panels 2.2 Facilities electrical and mechanical plans	2.1 Reading and understanding of units of measurements 2.2 Data gathering skills. 2.3 documentation skills 2.4 Communication skills
3. Analyze the energy consumption data	3.1. Collected data are normalized, analyzed and issues and trends identified. 3.2. Calibration and adjustment are made based on results of the analysis versus standards and requirements. * 3.3. Settings are adjusted based on results of the analysis versus	3.1. Basics of electrical controls 3.2. Facilities electrical and mechanical plans 3.3. Process, operation and control settings	3.1. Problem solving 3.2. Analytical skills 3.3. Skill in reading meters and use of instruments

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	standards and requirements. * 3.4. Other action plans are recommended based on the result of the analysis		

* *Critical Aspects of Competency*

RANGE OF VARIABLES

VARIABLE	RANGE
1. Collected data	May include: 1.1 Data based on Key Performance Index 1.2 KPI may include capacity. 1.3 Other energy data and statistics

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Conducted data gathering. 1.1.1. Gathered data for energy consumption based on checklist and forms. 1.1.2. Recorded, documented, and stored data properly for future analysis. 1.2. Used measuring tools and instrument panel for monitoring. 1.2.1. Used measuring tools and instrument panel to compare standards versus actual parameters. 1.3. Analyzed the energy consumption data. 1.3.1. Made calibration or adjustment based on results of the analysis. 1.3.2. Adjusted settings based on the results of the analysis.
2. Resource implications	The following resources should be provided: 2.1. Appropriate energy measuring equipment and tools. 2.2. Applicable PPE 2.3. Appropriate assessment resources 2.4. Workplace / assessment location 2.5. Legislation, policies, procedures, protocol, and local ordinances relating to energy utilization.
3. Method of assessment	Competency in this unit may be assessed through: 3.1. Demonstration/Observation with oral questioning 3.2. Written test 3.3. Portfolio
4. Context of assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY:

CARRY OUT IMPLEMENTATION AND IMPROVEMENT OF
ENERGY EFFICIENCY MEASURES

UNIT CODE

:

UTL741326

DESCRIPTOR

:

This unit covers the outcomes required to carry out implementation and improvement of energy efficiency measures. This unit includes competencies in studying/ selecting appropriate process, systems, and technology, applying appropriate process, systems and technology including operating and maintaining energy production and operation process, system and technology and including applicable EnMS management systems.

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Study/select appropriate process, systems, and technology	1.1. Use of different processes, systems and technology are evaluated and assessed based on facilities energy performance requirement. * 1.2. Appropriate process systems and technology are selected as per evaluation and assessment energy efficiency performance requirements. *	1.1. Understanding of the current process, systems and technology used. 1.2. Awareness of new process, system and technology and its functions 1.3. Communication techniques 1.4. Health and safety procedures 1.5. Company policy in relation to relevant technology 1.6. Machineries /equipment and their application	1.5. Analytical skills 1.6. Writing skills 1.7. Communication skills 1.8. Market research skills 1.9. Identifying relevant energy technology on job
2. Apply appropriate process, systems, and technology	2.1. Appropriate and approved process, systems and technology are effectively used in carrying the objectives set. * 2.2. Applicable software and hardware are used as per task requirement. * 2.3. Energy management concepts are observed and practiced following best practices on energy efficiency and conservation (EEC) which may	2.1. Communication techniques 2.2. Knowledge on operating instructions 2.3. Understanding software and hardware system 2.4. Health and safety procedure 2.5. Company policy in relation to relevant EEC technology 2.6. Different management concepts 2.7. Technology adaptability	2.1. Applying relevant technology 2.2. Communication skills 2.3. Using software application as needed 2.4. Conducting assessment evaluation and post implementation audit

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	pertain to ISO 50001.		
3. Operate and maintain energy production and operation process, system and technology and including applicable EnMS management systems	3.1. Energy production and operation process, and technology support are operated and maintained in accordance with industry <i>standard operating procedures, manufacturer's operating guidelines,</i> and occupational health and safety procedures to ensure reliability and safety. * 3.2. Energy production and operation process, systems and technology support are updated through continuing education or training in accordance with job requirements. 3.3. Failures/defects/variations and non-compliance are immediately reported to the concerned/responsible person or section for <i>appropriate action</i>	3.1. Awareness on EEC technology and its function 3.2. Understanding of the company's energy production and operation process, systems, and technology support 3.3. Repair and maintenance procedure. 3.4. Health and safety procedure 3.5. Upgrading of technology 3.6. Organizational set-up/workflow	3.1. Basic troubleshooting skills 3.2. Identifying failures or defects 3.3. Communication skills 3.4. Applying corrective and preventive maintenance. 3.5. Analytical skills 3.6. Using of software application as needed 3.7. Conducting assessment, evaluation, and post implementation audit

* Critical Aspects of Competency

RANGE OF VARIABLES

VARIABLE	RANGE
1. Processes, systems, and technology	Energy production and operation process, systems and technology support may include: 1.1 Office technology 1.2 Production & operation process 1.3 Industrial technology 1.4 System technology 1.5 Information technology 1.6 Training technology
2. Management Concepts	May include: 2.1 EnMS (ISO 50001) 2.2 Real time or Just in time (JIT) 2.3 PDCA 2.4 5S 2.5 TQM (ISO 9001, ISO 9002) 2.6 ISO 14001 2.7 Other Management Productivity Tools
3. Standard Operating Procedures	EEC Standard Operating Procedures may include: 3.1 Written guidelines relative to the usage of energy equipment/devices and control systems 3.2 Verbal advise / instruction from the co-worker. 3.3 Equipment manual of operation 3.4 Materials Safety data Sheet 3.5 Manufacturer's or Engineering recommended settings
4. Manufacture's operating guidelines / instruction	May include: 4.1 Written instruction / manual of specific EEC technology / equipment 4.2 General instruction manual 4.3 Recommendation from manufacturer relative to the operation of the EEC equipment (documented)
5. Appropriate action	May include: 5.1 Implementing preventive maintenance schedule. 5.2 Coordinating with manufacturer's technician

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Studied/Selected appropriate process, systems, and technology. 1.1.1. Evaluated and assessed use of different processes, systems and technology based on facilities energy performance requirement. 1.1.2. Selected appropriate process systems and technology as per evaluation and assessment energy efficiency performance requirements. 1.2. Applied appropriate process, systems, and technology. 1.2.1. Used appropriate and approved process, systems, and technology effectively in carrying the objectives set. 1.2.2. Used applicable software and hardware as per task requirement. 1.3. Operated and maintained energy production and operation process, system and technology and including applicable EnMS management systems. 1.3.1. Operated and maintained energy production and operation process, and technology support in accordance with industry standard operating procedures, manufacturer's operating guidelines, and occupational health and safety procedures to ensure reliability and safety
2. Resource implications	The following resources should be provided: 2.1. Appropriate equipment and tools 2.2. Applicable PPE 2.3. Appropriate assessment resources 2.4. Workplace/ assessment location 2.5. Relevant energy production and operation process, systems, and technology support
3. Method of assessment	Competency in this unit may be assessed through: 3.1. Demonstration/observation with questioning 3.2. Written test 3.3. Portfolio
4. Context of assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY :

**COORDINATE INVENTORIES AND PURCHASING/
SOURCING OF ENERGY EFFICIENT EQUIPMENT,
DEVICES, OR SERVICES**

UNIT CODE.

: **UTL741327**

DESCRIPTOR

: This unit covers the outcomes required to carry out inventories and purchasing/sourcing of energy efficient equipment or devices. The unit includes competencies in maintaining inventory records of energy equipment/devices, preparing purchase requisition/orders, and performing delivery acceptance of orders.

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Maintain inventory records of energy equipment/ devices	1.1. Relevant <i>inventory system</i> is used effectively in carrying out inventory function. * 1.2. Applicable software or system is used as per task requirement. 1.3. Inventory records are matched with the actual physical count. *	1.1. Communication techniques 1.2. Knowledge on operating instructions 1.3. Knowledge on software and hardware system 1.4. Inventory management, tracking and record monitoring systems/ techniques. 1.5. Record of machineries/ equipment supplier information	1.1. Applying relevant technology 1.2. Communicating skills 1.3. Using software application skills 1.4. Maintaining complete records 1.5. Tracking expiry dates of products (chemicals) and warranty coverage
2. Prepare purchase requisition/ orders	2.1. Specifications and terms of reference are checked for completeness and appropriateness for end use or purpose. * 2.2. Proposals are evaluated based on life cycle cost and equipment efficiency. *	2.1. Specification for items being purchased. 2.2. Conduct of technical evaluation of vendor proposal 2.3. Lifecycle costing 2.4. Recording or Log in Techniques 2.5. Tracking and Record Monitoring Systems/ techniques 2.6. Record of machineries/ equipment	2.1. Ability to coordinate with suppliers. 2.2. Analytical skills 2.3. Familiarity with Tracking Systems 2.4. Ability to coordinate with suppliers

ELEMENT	PERFORMANCE CRITERIA <i>(Italicized terms are elaborated in the range of variables)</i>	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		supplier information	
3. Perform delivery acceptance of orders	3.1. Delivered item are tested and evaluated based on specifications and standards and terms of reference of the purchase order. * 3.2. All purchases are tracked against warranty and expiry dates. *	3.1. Specifications and terms of reference of the items 3.2. Familiarity of purchase order and contract conditions 3.3. Identification and labeling of the equipment 3.4. Preparation of Records 3.5. Identification and labeling of the equipment 3.6. Records and log ins of Purchases 3.7. Warranty cards and information	3.1. Reading and writing skills 3.2. Skill in recognizing and detecting defects of units delivered. 3.3. Attention to details. 3.4. Familiarity of the areas where energy consuming devices are located. 3.5. Familiarity of Users and Suppliers

* Critical Aspects of Competency

RANGE OF VARIABLES

VARIABLE	RANGE
1. Inventory System	Inventory system may include: 1.1. Records and log ins of Purchases, installations, and warehouse inventory count 1.2. Warranty and guarantee cards and information 1.3. Materials safety and data sheet 1.4. Contact Persons of the supplier

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Maintained inventory records of energy equipment/ devices. 1.1.1. Used relevant inventory system effectively in carrying out inventory function. 1.1.2. Matched inventory records with the actual physical count 1.2. Prepared purchase requisition/ Orders 1.2.1. Checked specifications and terms of reference for completeness and appropriateness for end use or purpose. 1.2.2. Evaluated proposals based on life cycle cost and equipment efficiency. 1.3. Performed delivery acceptance of orders. 1.3.1. Tested and evaluated delivered item based on specifications and standards and terms of reference of the purchase order. 1.3.2. Tracked all purchases against warranty and expiry dates
2. Resource implications	The following resources should be provided: 2.1. Appropriate energy measuring equipment. 2.2. Applicable PPE 2.3. Appropriate resources 2.4. Workplace / assessment location 2.5. Legislation, policies, procedures, protocol, and local ordinances relating to energy utilization.
3. Method of assessment	Competency in this unit may be assessed through: 3.1. Demonstration/Observation with oral questioning 3.2. Written test 3.3. Portfolio
4. Context of assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : **INSTALL, OPERATE AND MAINTAIN ENERGY-CONSUMING MACHINES AND EQUIPMENT IN FACILITIES**

UNIT CODE : **UTL741328**

DESCRIPTOR : This unit covers the outcomes required to carry out installation, operation and maintenance of energy-consuming machines and equipment in facilities. This involves working with a team. The scope of this unit covers considering all equipment and devices used.

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for installation work	1.1. Instructions for the installation and work activities are communicated and confirmed to ensure clear understanding based on manufacturers and engineering requirements. 1.2. Tools, equipment, and PPE needed in specific work are identified and checked to ensure the work correctly as intended and are safe to use in accordance with established procedures. * 1.3. Materials and work methodology needed for installation work are obtained in accordance with established procedures. * 1.4. installation teams are identified for actual installation.	1.1. Awareness on energy equipment and devices and its functions and specifications 1.2. Communication techniques 1.3. Health and safety procedures on transport, handling, installation of equipment 1.4. Installation manual 1.5. Company policy in relation to relevant technology 1.6. Machineries/ equipment and their application 1.7. Other related documents and information needed for installation	1.1. Planning skills 1.2. Coordination and teamwork 1.3. Communication skills 1.4. Identifying relevant energy technology on job 1.5. Skill in using hand tools and power tools to do assembly. 1.6. Skill in determining if all electrical connections are within standards and regulations requirements.
2. Install energy-consuming machines and equipment in facilities.	2.1. Energy consuming machines and equipment are installed following standard installation guides and reference materials . * 2.2. Relevant process, systems and technology needed	2.1. Communication techniques 2.2. Health and safety procedures on transport, handling, installation of equipment 2.3. Installation manual 2.4. Other related documents and	2.1 Applying relevant technology 2.2 Communicating skills 2.3 Using software application skills 2.4 Technical skills for installation work (electrical,

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized</i> terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	in the installation is used effectively in carrying out the installation function. * 2.3. Software and hardware are used as applicable. 2.4. Energy consuming machines and equipment are tested and commissioned following standards. * 2.5. Management concepts are observed and practiced per established energy efficiency and conservation (EEC) practices	information needed for installation. 2.5. Knowledge on Operating instructions 2.6. Understanding software and hardware system	mechanical, civil, etc.) 2.5 Use of Installation Manuals 2.6 Interpretation skills of drawings on manuals
3. Notify completion of installation work	3.1. Final checks are made to ensure the installation work conforms to instructions and requirements. * 3.2. Supervisor is notified upon completion of work. * 3.3. All relevant documents are turned over to concerned parties. 3.4. Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked, and returned to storage in accordance with established procedures. 3.5. Work area is cleaned and made safe	3.1. Use of turnover Checklists 3.2. Health and safety procedures on transport, handling, installation of equipment including storage and disposal. 3.3. Installation manual 3.4. Familiarity with required tools 3.5. Preparation of a log sheet for all equipment users. 3.6. Documentation of all necessary procedures and steps to guide users. 3.7. Other related documents and information needed for installation, operation, maintenance, and troubleshooting	3.1. Use of Installation Manuals 3.2. Coordination skills 3.3. Inventory of equipment, tools, and parts on and off job sites. 3.4. Maintain a clean, organized environment at the job site
4. Operate and maintain energy-consuming	4.1. Safety policies and procedures are followed in	4.1. Awareness on EEC technology and its function	4.1. Performing basic troubleshooting

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the range of variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
machines and in equipment facilities	accordance with OSH and enterprise procedures. * 4.2. Materials, tools, equipment, testing devices and PPE needed are prepared for the maintenance work requirements. * 4.3. Potential hazards are identified for prevention and control measures are selected in accordance with the work plan and site procedures. 4.4. Operation and maintenance of energy consuming equipment is performed in accordance with applicable standards and policies on operation and maintenance. * 4.5. Work instructions are prepared according to machine's manual and established enterprise procedures. 4.6. Concerned department/ personnel are informed on the schedule of work according to standard operating procedure. 4.7. Availability of maintenance records are prepared in accordance with established procedure. *	4.2. Operation and maintenance procedures 4.3. Repair and maintenance procedure. 4.4. Health and safety procedure 4.5. Upgrading of technology 4.6. Organizational set-up/workflow 4.7. Incident management and disaster management	g and repair skills 4.2. Performing preventive maintenance 4.3. Identifying failures or defects 4.4. Communication skills 4.5. Applying corrective maintenance.

* Critical Aspects of Competency

RANGE OF VARIABLES

VARIABLE	RANGE
1. relevant documents	May include: 1.1. MSDS, 1.2. installation guide, 1.3. operating manual, 1.4. warranty, 1.5. guarantee, 1.6. contact information of suppliers
2. Reference materials	May include: 2.1. Operation Manual 2.2. Equipment Manual 2.3. Installation Procedures 2.4. Preventive Maintenance Manual 2.5. Safety and handling procedures of equipment

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Planned and prepared for installation work. 1.1.1. Identified and checked tools, equipment and PPE needed in specific work to ensure the work correctly as intended and are safe to use in accordance with established procedures. 1.1.2. Obtained materials and work methodology needed for installation work in accordance with established procedures. 1.2. Installed energy-consuming machines and equipment in facilities are tested and operates properly. 1.2.1. Installed energy consuming machines and equipment following standard installation guides and reference materials. 1.2.2. Used relevant process, systems and technology needed in the installation effectively in carrying out the installation function. 1.2.3. Tested and commissioned energy consuming machines and equipment following standards. 1.3. Notified completion of installation work 1.3.1. Made final checks to ensure the installation work conforms to instructions and requirements. 1.3.2. Notified supervisor upon completion of work. 1.4. Operated and maintained energy-consuming machines and equipment in facilities. 1.4.1. Safety policies and procedures are followed in accordance with OSH and enterprise procedures. 1.4.2. Prepared materials, tools, equipment, testing devices and PPE needed for the maintenance work requirements. 1.4.3. Performed operation and maintenance of energy consuming equipment in accordance with applicable standards and policies on operation and maintenance. 1.4.4. Prepared availability of maintenance records in accordance with established procedure
2. Resource Implications	The following resources should be provided: 2.1. Appropriate energy measuring equipment. 2.2. Applicable PPE 2.3. Appropriate installation, operation, and maintenance tools 2.4. Workplace or assessment area
3. Method of assessment	Competency in this unit may be assessed through: 3.1. Demonstration/Observation with oral questioning 3.2. Written test 3.3. Portfolio
4. Context of assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : **APPLY ENERGY MANAGEMENT SYSTEM
STANDARDS**

UNIT CODE : **UTL311208**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to implement, monitor, and manage energy consumption thru the implementation of Energy Management Systems following the ISO 50001 principles and standards. This would entail energy management systems training that include continuous improvement of processes, and documentation which is all geared towards energy efficiency and conservation. It involves data collection and keeping accurate and complete records and documentation.

ELEMENT	PERFORMANCE CRITERIA (<i>Italicized terms are elaborated in the Range of Variables</i>)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Access information concerning energy management systems, energy efficiency programs and policies	• Relevant provisions of energy management related regulations and issuances from DOE environmental legislation and codes of practice are accurately followed • Information on workplace energy management policies, procedures and programs is stored in a readily accessible location and manner • Information is accurately and clearly explained to the work team • Information about the outcomes of energy management systems, identification and control procedures is provided to the appropriate personnel	• Relevant Energy Laws and Energy Management and Energy Efficiency related circulars, issuances, and programs • Company's Energy management system policies, initiatives, process, and procedures. • Energy efficiency standards required in the workplace	• Workplace reporting and recording processes and procedures • Communication skills • Accessing information and data • Ability to recognize potential increase in energy consumption and identifying ways of minimizing them.

2. Implement and monitor procedures concerning energy usage	- Existing and potential areas for energy savings in the workplace are identified and reported - Identified priority energy consuming devices/ equipment are assessed in relation to relevant energy consumption baseline or standards Workplace procedures dealing with energy intensive processes are implemented wherever necessary to ensure that prompt control action is taken to ensure efficiency measures	- Relevant energy management related laws and regulations & codes of practice in Energy Efficiency and Energy Conservation - Company's energy policy, process, procedures, and guidelines for implementing and monitoring EnMS - Equipment and resources required when implementing and monitoring energy conservation measures. Organizational structure and site layout should be made clear and available.	- Workplace reporting and recording processes and procedures - Communication skills - Problem solving skills - Ability to recognize potential energy savings in the workplace - Counseling, advising, and informing others on energy conservation matters - Identifying and correctly using equipment and vehicles in accordance with energy conservation measures (ECM)
3. Implement and monitor energy management procedures following the PDCA cycle	- Existing energy efficiency measures are implemented, monitored, and reviewed - Work procedures to implement energy management systems and energy conservation measures are implemented and adherence to them by the work group is monitored - Required improvements to existing control measures are identified, including required resources for implementation, and reported to appropriate personnel	- Relevant energy management and energy conservation related regulations & Codes of practice are in place. - Company's energy policy, process and procedures and guidelines for implementing and monitoring EnMS. - Equipment and resources required when implementing and monitoring Energy Management Systems control procedures - Organizational structure and site layout	- Workplace reporting and recording processes and procedures - Communication skills - Accessing information and data - Problem solving skills - Ability to counsel, advise and inform others on environmental control procedures - Identifying and correctly using equipment and vehicles in accordance with environmental control procedures, regulations, and guidelines.

RANGE OF VARIABLES

VARIABLE	RANGE
1 Information	Information/documents may include: 1.1 Workplace procedures and practices related to energy consumption, including all financial, operating and customer service policies and procedures 1.2 Occupational Health & Safety 1.3 Regulations for Compliance 1.4 Workplace housekeeping procedures and policies 1.5 Code of practice for energy management system 1.6 Policies and procedures for equipment and devices used in the workspace 1.7 Manufacturer's instructions concerning the use and servicing of equipment 1.8 Plans, Objectives and Targets 1.9 Documentation, Review 1.10 Monitoring and Control 1.11 Checking for Corrective Actions 1.12 Management Review
2 Appropriate personnel	Appropriate personnel may include: 2.1 Workplace personnel including supervisors and management 2.2 Site Engineers 2.3 Contractors 2.4 Operators and Maintenance personnel
3 Areas for energy saving (Energy Cost Centers)	Energy Cost Centers may include: 3.1 Administration Building 3.2 Production area 3.3 Packaging Area 3.4 HVAC Systems 3.5 Power Generation
4 Workplace procedures	Workplace procedures for Energy Intensive Processes may include: 4.1 Inspection and housekeeping 4.2 Maintenance including plant and equipment 4.3 Measurement and Monitoring System 4.4 Operational instruction on Phantom load detection 4.5 Energy Usage Peak and Off-Peak Hours

Training Arrangements

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for Competency Standard of ECOs.

3.1 CURRICULUM DESIGN

Recognized Training Institutions shall provide the training on the development of competency-based curricula to enable training providers develop their own curricula with the components mentioned below.

Delivery of knowledge requirements for the basic, common and core units of competency specifically in the areas of mathematics, science/technology, communication/language, and other academic subjects shall be contextualized. To this end, TVET providers shall develop a Contextual Learning Matrix (CLM) to include green technology, issues on health and drugs and catering to persons with disabilities (PWD's) to accompany their curricula.

Course Title	:	Energy Efficiency and Conservation Level III
Nominal Training Duration	:	1 hr. – Common Competency 47 hrs. – Core Competencies ----- 48 hrs. – Total training duration

* SIL can be delivered thru Dual Training System (DTS)/Dualized Training Program (DTP) or Enterprise-based Training

Note: Trainees who are employed workers may request the SIL to be done in their own company upon approval of the training provider

Course Description:

This program is designed to provide the learner with knowledge, practical skills and attitude, applicable in performing work activities involve in managing energy consumption of facilities, equipment and devices, planning and supporting the implementation of regular energy audit, performing energy consumption monitoring and control, carrying out implementation and improvement of energy efficiency measures, coordinating inventories and purchasing/sourcing of energy efficient equipment or devices, and installing, operating and maintaining energy-consuming machines and equipment in facilities.

Upon completion of the program, the learners are expected to demonstrate the above-mentioned competencies to be employed. To obtain this, all units prescribed for this qualification must be achieved.

3.2 TRAINEE ENTRY REQUIREMENT

The trainees who wish to enter the course should possess the following requirements:

- Must have completed at least 2 years of college education or completed a TESDA technical vocational program related to energy, power, and associated technologies.
- Must have at least (2) years of continuous hands-on experience in the installation, operation and maintenance of energy-consuming machines and equipment in facilities.
- Able to communicate both oral and/or written.

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Accessed information concerning Energy management systems, Energy efficiency programs and policies 1.2 Implemented and monitored procedures concerning energy usage 1.3 Implemented and monitored energy management procedures following the PDCA cycle
2. Resource implications	The following resources should be provided: 2.1 Energy Management Systems procedural manual and trainings. 2.2 Energy Laws and Regulations on Energy Efficiency and Energy Conservation 2.3 Appropriate energy measuring equipment 2.4 Applicable PPE 2.5 Appropriate installation tools (i.e., pliers, screwdrivers, etc.) 2.6 Workplace or assessment area
3. Methods of assessment	Competency in this unit may be assessed through: 3.1 Direct evaluation of energy management performance monitoring and control 3.2 Demonstration/Observation with oral questioning 3.3 Written test 3.4 Use of methods of measurements and verification for the implementation of energy efficiency and conservation projects
4. Context of assessment	4.1 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines 4.2 Assessment may be conducted in the workplace.

3.3 LIST OF TOOLS, EQUIPMENT AND MATERIALS

Recommended list of tools, equipment, and materials for the training of **25 trainees** for Energy Efficiency and Conservation NC III:

Up-to-date tools, materials, and equipment of equivalent functions can be used as alternatives. This also applies in consideration of community practices and their availability in the local market.

Equipment	
QTY	ITEM
IT SYSTEM	
1	PC/Laptop
1	Sound system
1	LCD /multimedia projector / TV monitor
1	White board

NOTES: Access to and use of equipment /facilities can be provided through cooperative arrangements or MOA with other partner-companies. Subject to conformity of the health and safety protocols

3.4 TRAINING FACILITIES

Based on a class intake of 25 students/trainees.

Space Requirements	Space (m)	Area in Sq. Meters	Qty	Total Area in Sq. Meters
LECTURE AREA / WORKSHOP AREA*	6 x 10	60	1	60
LEARNING RESOURCE AREA	3 x 4	12	1	12
TOOL/STORAGE /CABINET AREA*	2 x 2	4	1	4
WASHROOM & TOILET *	2 x 3	6	1	6
TOTAL				82
FACILITIES/EQUIPMENT/CIRCULATION				25
TOTAL AREA				107

*Common facilities/** Area requirement is equivalent to 30% of the total teaching/learning areas

NOTES: Access to and use of equipment /facilities can be provided through cooperative arrangements or MOA with other partner-companies. Subject to conformity of the health and safety protocols.

3.5 TRAINERS QUALIFICATIONS FOR MCP PROGRAM OF ECO

- Must be DOE Certified Energy Manager or Certified Energy Auditor
- Preferably have a PRC license related to energy, power, engineering, and associated technologies.
- Must have at least 2 years relevant industry experience within the last 5 years.
- Must be computer literate

3.6 INSTITUTIONAL ASSESSMENT

Institutional Assessment is the gathering of evidence to determine the achievements of the requirements of the competency standards to enable the trainer to make a judgement whether the trainee is competent or not competent.

GLOSSARY OF TERMS

GENERAL

- 1) **Certification** - is the process of verifying and validating the competencies of a person through assessment.
- 2) **Certificate of Competency (COC)** – is a certification issued to individuals who pass the assessment for a single unit or cluster of units of competency.
- 3) **Common Competencies** - are the skills and knowledge needed by all people working in a particular industry.
- 4) **Competency** - is the possession and application of knowledge, skills, and attitudes to perform work activities to the standard expected in the workplace.
- 5) **Competency Assessment** - is the process of collecting evidence and making judgments on whether competency has been achieved.
- 6) **Competency Standard (CS)** - is the industry-determined specification of competencies required for effective work performance.
- 7) **Context of Assessment** - refers to the place where assessment is to be conducted or carried out.
- 8) **Core Competencies** - are the specific skills and knowledge needed in a particular area of work - industry sector/occupation/job role.
- 9) **Critical aspects of competency** - refers to the evidence that is essential for successful performance of the unit of competency.
- 10) **Elements** - are the building blocks of a unit of competency. They describe in outcome terms the functions that a person performs in the workplace.
- 11) **Evidence Guide** - is a component of the unit of competency that defines or identifies the evidence required to determine the competence of the individual. It provides information on critical aspects of competency, underpinning knowledge, underpinning skills, resource implications, assessment method and context of assessment.
- 12) **Level** - refers to the category of skills and knowledge required to do a job.
- 13) **Method of Assessment** - refers to the ways of collecting evidence and when, evidence should be collected.
- 14) **National Certificate (NC)** – is a certification issued to individuals who achieve all the required units of competency for a national qualification defined under the Training Regulations. NCs are aligned to specific levels within the PTQF.
- 15) **Performance Criteria** - are evaluative statements that specify what is to be assessed and the required level of performance.
- 16) **Qualification** - is a cluster of units of competencies that meets job roles and is significant in the workplace. It is also a certification awarded to a person on successful completion of a course in recognition of having demonstrated competencies in an industry sector.
- 17) **Range of Variables** - describes the circumstances or context in which the work is to be performed.
- 18) **Recognition of Prior Learning (RPL)** – is the acknowledgement of an individual's skills, knowledge and attitudes gained from life and work experiences outside registered training programs.

SECTOR SPECIFIC

- 1) **Analog instruments** are mechanical devices that indicate the magnitude of the quantity in the form of the pointer movement, and the value is read according to markings on a scale and gives an output that varies continuously as the quantity being measured changes.
- 2) **ASHRAE** refers to American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE ASH-ray) is an American professional association seeking to advance heating, ventilation, air conditioning and refrigeration (HVAC&R) systems design and construction. ASHRAE has more than 57,000 members in more than 132 countries worldwide.
- 3) **Calibration** is the comparison of measurement values delivered by a device under test with those of a calibration standard of known accuracy.
- 4) **Certified Energy Conservation Officer (CECO)** refers to a professional who obtains a certification as a CECO after demonstrating high levels of experience, competence, proficiency, and ethical fitness in the energy management profession, and who shall be responsible for the supervision and maintenance of the facilities of Type 1 designated establishments for the proper management of energy consumption and such other functions deemed necessary for the efficient and judicious utilization of energy under the Act.
- 5) **Certified Energy Manager (CEM)** refers to a licensed engineer who obtains a certification as a CEM after demonstrating high levels of experience, competence, proficiency, and ethical fitness in the energy management profession, and who shall be chosen by Type 2 designated establishments to plan, lead, manage, coordinate, monitor, and evaluate the implementation of sustainable energy management within their organizations.
- 6) **Designated Establishment** refers to a private or public entity in the commercial, industrial, transport, power, agriculture, public works, and other sectors identified by the DOE as energy intensive industries based on their annual energy consumption in the previous year or an equivalent annual index; the amount of consumption is indicated in the Act and subject to adjustment by the DOE as it deems necessary.
- 7) **Digital instrument** has an output that varies in discrete steps and so can have only a finite number of values.
- 8) **Distribution Utility** refers to any electric cooperative, private corporation, government-owned utility, or existing local government unit which has an exclusive franchise to operate a distribution system including those whose franchise covers economic zones.
- 9) **Energy** refers to all types of energy available commercially including natural gas (liquid natural gas and liquid oil gas), all heating and cooling fuels (including district heating and district cooling), coal, transport fuels, and renewable energy sources.
- 10) **Energy Accounting Center (EAC)** refers to an identified separate and distinct area of the organization for effective control and monitoring of energy consumption.
- 11) **Energy Audit** refers to the evaluation of energy consumption and review of current energy cost to determine appropriate intervention measures and efficiency projects in which energy can be judiciously and efficiently used to achieve savings.
- 12) **Energy audit report** refers to the results of an energy audit where it identifies energy consumed by a facility and locates energy conservation measures.
- 13) **Energy Conservation** refers to the reduction of losses or wastage in various energy stages from energy production to energy consumption through the adoption of appropriate measures which may, among others be, technologically feasible, economically sound, environmentally friendly, or socially affordable.
- 14) **Energy Conservation Measures (ECM)** refers to the upgrades, retrofits, repairs, and replacements that businesses can implement to become more energy efficient.

- 19) **Resource Implication** - refer to the resources needed for the successful performance of the work activity described in the unit of competency. It includes work environment and conditions, materials, tools, and equipment.
- 20) **Basic Competencies** - are the skills and knowledge that everyone needs for work.
- 21) **Underpinning Knowledge** - refers to the competency that involves in applying knowledge to perform work activities. It includes specific knowledge that is essential to the performance of the competency.
- 22) **Underpinning Skills** - refers to the list of the skills needed to achieve the elements and performance criteria in the unit of competency. It includes generic and industry specific skills.
- 23) **Unit of Competency** – is a component of the competency standards stating a specific key function or role in a particular job or occupation; it is the smallest component of achievement that can be assessed and certified under the PTQF.

- 33) **Minimum Energy Performance (MEP)** refers to a performance standard, which prescribes a minimum level of energy performance for energy-consuming products including appliances, lighting, electrical equipment, machinery, and transport vehicles that must be met or exceeded before they can be offered for sale or used for residential, commercial, transport, and industrial purposes.
- 34) **OHSAS 18001** is a framework for an Occupational Health and Safety (OHS) Management Systems and is part of the OHSAS 18000 series of standards, along with OHSAS 18002.
- 35) **Operation and Maintenance (O&M)** means the functions, duties and labor associated with the daily operations and normal repairs, replacement of parts and structural components, and other activities needed to preserve an asset so that it continues to provide acceptable services and achieves its expected life.
- 36) **Personal Protective Equipment (PPE)** refers to protective clothing, helmets, goggles, or other garment or equipment designed to protect line personnel from job-related occupational hazards.
- 37) **Philippine Qualifications Framework (PQF)** refers to a national policy describing the levels of educational qualifications and sets of standards for qualification outcomes. It is a quality assured national system for the development, recognition, and award of qualifications based on the standards of knowledge, skills, and values acquired in different ways and methods by learners and workers. It is an assessment-based qualification recognition which is competency-based, and labor market driven.
- 38) **Record Monitoring System** involves collecting energy consumption data for each Energy Accounting Center (EAC).
- 39) **Repair and Maintenance** refers to those activities associated with the routine care and upkeep of a structure or an asset to keep it operating at its present condition.
- 40) **Risks** refers to a probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action.
- 41) **Safety protocols** refers to workplace safety protocols, often called safety procedures, are step-by-step safety plans guiding employees through the safe performance of a given workplace procedure.
- 42) **Specific Energy Consumption** refers to the energy consumption volume required per unit, such as production volume, sales amount, transportation kilometer, transportation ton-kilometer, floor space, and such other indicators relevant to energy consumption.
- 43) **Technology Adaptability** is the ability to learn technology quickly and with confidence.
- 44) **Transmission Utility** refers to any private corporation or government-owned utility which has an exclusive franchise to operate the system of wires for the conveyance of electricity through a high voltage backbone line.
- 45) **Transport Vehicle** refers to land, air, or sea vehicles conveying cargo or passengers, regardless of size or weight classification.
- 46) **Voltage Detector** is a sensor used to detect presence of electricity in a wire.

- 15) **Energy Consumption** is the amount of energy or power used and refers to energy used to perform an action, manufacture something or simply inhabit a building.
- 16) **Energy Efficiency** refers to the way of managing or restraining the growth in energy consumption resulting in the delivery of more services for the same energy input or the same services for less energy input.
- 17) **Energy Efficiency and Conservation Officer** (EEC Officer) refers to the head of the EECO responsible for overseeing the implementation of the Local EE&C Plan at the local government level, who may be designated from the existing personnel of the LGU.
- 18) **Energy Efficiency Index** refers to an efficiency performance measure or indicator expressed as a ratio or index of energy utilization.
- 19) **Energy Efficiency Standards** refers for the energy performance measurement used as an industry reference guide following extensive studies, benchmarking, best practices, and regulatory requirements.
- 20) **Energy Efficient Technologies** refers to technologies that use Energy efficiency as a means of measuring the energy-expenditure required to achieve a certain benefit. The lower the losses in energy in achieving a specific purpose, the higher are the degree of energy efficiency.
- 21) **Energy End User** refers to all individuals and entities, which consume energy to include households, industrial and commercial customers, power plants, distribution utilities, and transmission utilities.
- 22) **Energy Intensive Industries** are industries that use large amounts of energy such as iron and steel, cement, and pulp and paper.
- 23) **Energy Management** refers to the process of designing and/or implementing an optimal program of purchasing, generating, and consuming various types of energy based on the end user's overall short-term and long-term management program, with due consideration of factors including costs, availability, economics, and environmental impact.
- 24) **Energy Management System (EnMS)** refers to a management system or process to manage the energy in the establishment following ISO 50001 requirements and guidance.
- 25) **Energy Performance Requirement** refers to the standard or goal for energy performance required to be achieved for a period following regulatory requirements and/or business plans.
- 26) **Full Body Harness** is form of protective equipment designed to protect a person from injury due to falling.
- 27) **Hazard Control Measures** refer to measures that eliminate the hazards from the workplace to protect the workers and include wearing of appropriate Personal Protective Equipment (PPEs).
- 28) **Hazard Prevention** refers to effective controls to protect workers from workplace hazards; help avoid injuries, illnesses, and incidents; minimize or eliminate safety and health risks; and help employers provide workers with safe and healthful working conditions.
- 29) **Hazardous** an atmosphere that may expose employees to the risk of death, atmosphere incapacitation, impaired ability to self-rescue unaided, injury, or acute illness.
- 30) **Hygrometer** is an instrument used to measure the amount of water vapor in air, in soil, or in confined spaces.
- 31) **Installation** is the act or process of making a machine, a service, etc., ready to be used in a certain place: the act of installing something (such as a piece of equipment end made ready for use.
- 32) **Inventory management system** (or inventory system) is the process by which you track your goods throughout your entire supply chain, from purchasing to production to end sales. It governs how you approach inventory management for your business.



EUMB - EPMPD
Quality Management System
CECO APPLICATION FORM
(ANNEX B)

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CHECKLIST FOR CERTIFIED ENERGY CONSERVATION OFFICER APPLICANT

- ☐ One (1) Original copy of Letter of Endorsement from the head of the Type 1, 2, or 3 Designated Establishment;
- ☐ One (1) Certified True Copy of any academic credentials and for graduates of K-12 Academic Track of Science, Technology, Engineering and Mathematics (STEM), Transcript of Records and/or Diploma;
- ☐ One (1) Original Copy of Sworn statement of the applicant in discharging functions of Energy Conservation Officer; and
- ☐ One (1) Copy of Proof of payment of One Thousand Pesos (PHP 1,000.00) for Application Fee for Certification
- ☐ One (1) Copy of specialized and/or refresher training from Recognized Training Institution (RTI) *

*Additional for renewal application

Type of Application :

☐ New

☐ Renewal

DOE CECO APPLICATION FORM

GENERAL INFORMATION

Name : _____
Sumame First Name Middle Name

Address : _____

TIN : _____

Contact number : _____

E-mail address : _____

Birth date : _____

Birthplace : _____

Highest Educational : _____

Attainment : _____

PRC ID No (if any) : _____

Work Experience

Inclusive Dates (dd/mm/yyyy)		Position Title	Name of Company
From	To		

(Continue on a separate sheet if necessary)



EUMB - EPMPD
Quality Management System
CECO APPLICATION FORM
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Seminar/Training Program Attended *

Title of Seminar/Training Programs (Write in full)	Inclusive Dates (dd/mm/yyyy)		Number of Hours	Conducted/Sponsored By (Write in full)

(Continue on a separate sheet if necessary)

Reference/s (Provide three (3) non-relative persons.)

Name

Contact Number

Assurances:

By signing this application form and this set of assurances, I hereby acknowledge the following conditions of the Energy Utilization Management Bureau (EUMB)/ Energy Efficiency and Conservation Program Management and Technology Promotion Division (EPMPD) and agree to abide by them if this application is accredited.

1. I agree to submit complete registration/certification requirement documents and to abide by the accreditation criteria for CECO.
2. I hereby authorized the EPMPD of DOE to make direct inquiries to any person, firm, or organization named in the application to verify the information submitted herein.
3. I further agree that if we provide false or misleading information on our application form or otherwise fail to demonstrate that we have sufficient experience or qualifications to perform as CECO, the EPMPD has the right to suspend without prior notice my accreditation from the Registration.
4. I, the undersigned, hereby apply for the registration/certification with EPMPD and certify that, to the best of my knowledge, the particulars given in this application and all accompanying documents/information are true and correct.

NAME : _____

SIGNATURE : _____

DATE : _____



EUMB - EPMPD
Quality Management System
SUBMISSION GUIDELINES
(ANNEX C)

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SUBMISSION GUIDELINES

The documents pertaining to the application of CECO to the DOE can be accessed through (https://bit.ly/DOE_DConCECO)

All applications, together with the required documents, should be submitted through the doe identified platform: https://bit.ly/Apply_CECO. Please take note that submissions made through e-mail addresses will not be deemed official by the DOE. All queries and questions should be sent at e-mail address: certifiedeco@doe.gov.ph.

For further guidance, the following documents should be included in the e-mail of the applicant:

1. One (1) Original copy of Letter of Endorsement from the head of the Type 1 Designated Establishment
(PDF File, File Name: "CECO_Last Name_Endorsement.pdf")
2. One (1) Certified True Copy of any academic credentials and for graduates of K-12 Academic Track of Science, Technology, Engineering and Mathematics (STEM), Transcript of Records and/or Diploma
(PDF File, File Name: "CECO_Last Name_Credentials.pdf")
3. One (1) Original copy of Sworn statement of the applicant in discharging functions of Energy Conservation Officer (Annex B)
(PDF File, File Name: "CECO_Last Name_SwornStatement.pdf")
4. One (1) Copy of Proof of payment of One Thousand Pesos (PHP 1,000.00) for Application Fee for Certification
(PDF File, File Name: "CECO_Last Name_Payment.pdf")
5. One (1) Copy of Seminar/Training Programs attended
(PDF File, File Name: "CECO_Last Name_Training.pdf")



EUMB - EPMPD
Quality Management System
CECO APPLICATION PROCESS
(ANNEX D)

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**RESPONSIBLE
OFFICE/UNIT**

PROCEDURES

**PROCESSING
TIME**

Staff, EPMPD

N/A

Staff, EPMPD

3 Working Days

Staff, EPMPD
Staff, Treasury

Staff, EPMPD

2 Working Days

Staff, EPMPD

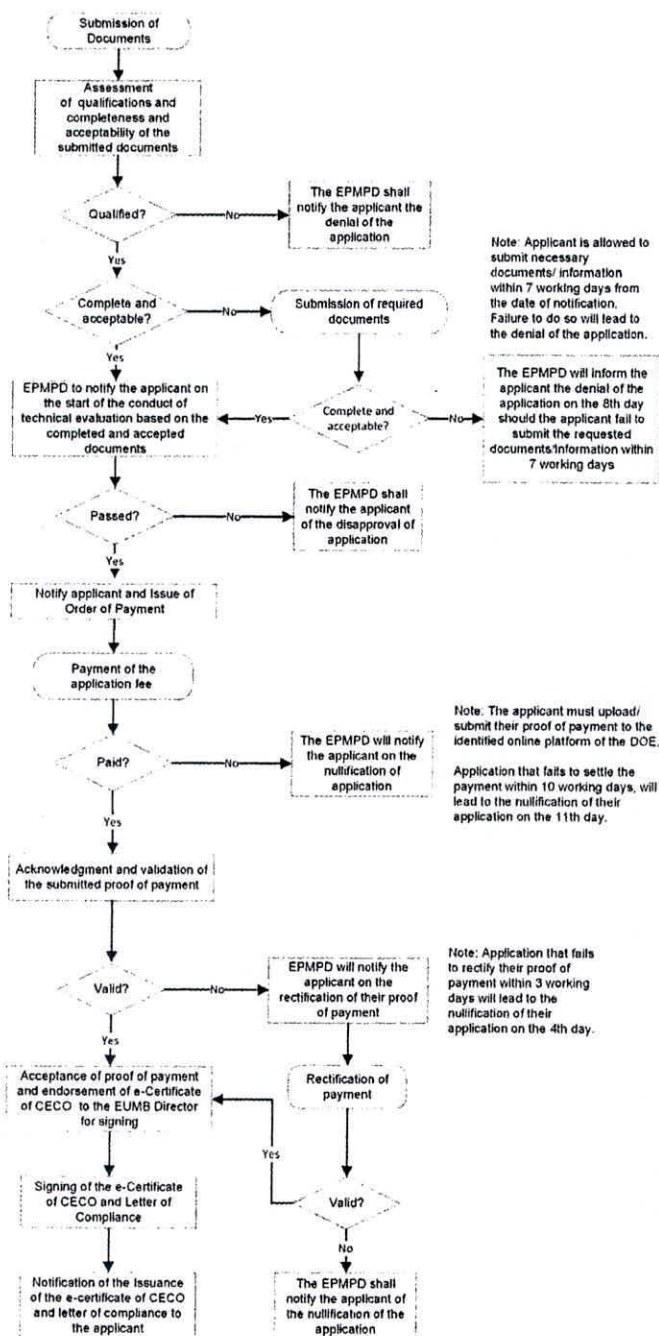
1 Working Day

Director, EUMB

Staff, EPMPD

1 Working Day

7 Working Days



* Legend:

- Applicant

- DOE

- Decision