TRAINING REGULATIONS (TR)

ENERGY MANAGEMENT

The Training Regulations (TR) serve as basis for the:

1 Registration and delivery of training programs;
2 Development of curriculum and assessment instruments; and
3 Competency assessment and certification

Each TR has four sections:

Section 1 **Definition of Qualification** describes the qualification and defines the competencies that comprise the qualification.

Section 2 **Competency Standards** gives the specifications of competencies required for effective work performance.

Section 3 **Training Arrangements** contains information and requirements in designing training program for certain qualification. It includes curriculum design; training delivery; trainee entry requirements; tools, equipment, and materials; training facilities; trainer's qualification; and institutional assessment.

Section 4 **Assessment and Certification Arrangements** describes the policies governing assessment and certification procedures.

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ENERGY MANAGEMENT

Section 1 ENERGY MANAGEMENT QUALIFICATION

The **Energy Management Qualification** consists of competencies that a person must achieve to enable him/her to demonstrate competence, proficiency and ethical fitness in energy management specifically for the supervision and maintenance of the facilities of Type 2 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	BASIC COMPETENCIES
DOE-CEM-01	Lead workplace communication
DOE-CEM-02	Lead small teams
DOE-CEM-03	Apply critical thinking and problem-solving techniques in the workplace
DOE-CEM-04	Work in a diverse environment
DOE-CEM-05	Propose methods of applying learning and innovation in the organization
DOE-CEM-06	Use information systematically
DOE-CEM-07	Evaluate occupational safety and health work practices
DOE-CEM-08	Evaluate environmental work practices
DOE-CEM-09	Facilitate entrepreneurial skills

Code	COMMON COMPETENCIES
DOE-CEM-10	Energy Management System (Iso 50001 or Similar Framework) Basic Awareness
DOE-CEM-11	Energy Audit (ISO 50002 or Similar Framework) Basic Awareness
DOE-CEM-12	Industry Rules and Regulations Awareness
DOE-CEM-13	Operate and Maintain Tools and Equipment for Monitoring, Testing and Technical Audit

Code	CORE COMPETENCIES
DOE-CEM-14	1.1.1.1. Energy Management System Development and Implementation
DOE-CEM-15	1.1.1.2. Plan and Organize Energy Audit (Basic Energy Audit: Electrical, Mechanical, And Thermal)
DOE-CEM-16	Technical Competencies
1.1.1.3.	1.1.1.4.

A person who has achieved this Qualification is competent to be:

- Energy Manager

CERTIFICATION

The certification of experience duration and field is proposed to be given by the respective organizations where the trainees belong. For independent professionals, certification may be issued from clients or organizations where the required activities were conducted.

1. **Qualifications of Candidate/Training Participant (*As described in the IRR*)**

    1.1 Must be a licensed engineer or a graduate of 4-year course with at least 3 years continuous hands-on experience in the installation, maintenance and operation of energy consuming machines in facilities with Type 2 Designated Establishments;

    1.2 The certification of experience duration and field is proposed to be given by the respective organizations where the trainees belong. For independent professionals, certification may be issued from clients or organizations where the required activities were conducted.

2. **Certification Process**

    2.1 The trainees are to undergo training from DOE Accredited Training Institutions (ATI)
    2.2 A minimum attendance shall be required by the ATI from the participants.
    2.3 A test/examination shall be instituted by the ATI after the training.
    2.4 Participants passing the test (recommended at 80% passing) and completed at least 80% attendance rate shall be given the certification.
    2.5 The ATI shall issue the certificates.

3. **Training Content Requirement**

    3.1 DOE Technical Working Group (TWG) shall finalize the Training Content Requirement for each CEM course.
    3.2 Each ATI shall submit to DOE its Training Plans to comply with the Training Course Requirement each for CEM courses for approval.
    3.3 The DOE approved Training Plan shall be the basis of the ATI to run its Training Courses.

SECTION 2: COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common, and core units of competency required for Certified Energy Managers (CEM).

BASIC COMPETENCIES

UNIT OF COMPETENCY : LEAD WORKPLACE COMMUNICATION

UNIT CODE : DOE-CEM-01

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to lead in the dissemination and discussion of ideas, information and issues in the workplace.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Communicate information about workplace processes	1.1 Relevant ***communication method*** is selected based on workplace procedures 1.2 Multiple operations involving several topics/areas are communicated following enterprise requirements 1.3 Questioning is applied to gain extra information 1.4 Relevant sources of information are identified in accordance with workplace/ client requirements 1.5 Information is selected and organized following enterprise procedures 1.6 Verbal and written reporting is undertaken when required 1.7 Communication and negotiation skills are applied and maintained in all relevant situations	1.1. Organization requirements for written and electronic communication methods 1.2. Effective verbal communication methods 1.3. Business writing 1.4. Workplace etiquette	1.1. Organizing information 1.2. Conveying intended meaning 1.3. Participating in a variety of workplace discussions 1.4. Complying with organization requirements for the use of written and electronic communication methods 1.5. Effective business writing 1.6. Effective clarifying and probing skills 1.7. Effective questioning techniques (clarifying and probing)
2. Lead workplace discussions	2.1 Response to workplace issues is sought following enterprise procedures 2.2 Response to workplace issues is provided immediately 2.3 Constructive contributions are made to ***workplace discussions*** on such issues	2.1 Organization requirements for written and electronic communication methods 2.2 Effective verbal	2.1 Organizing information 2.2 Conveying intended meaning 2.3 Participating in variety of workplace discussions

	as production, quality and safety 2.4 Goals/objectives and action plans undertaken in the workplace are communicated promptly	communication methods 2.3 Workplace etiquette	2.4 Complying with organization requirements for the use of written and electronic communication methods 2.5 Effective clarifying and probing skills
3. Identify and communicate issues arising in the workplace	3.1 Issues and problems are identified as they arise 3.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3 Dialogue is initiated with appropriate personnel 3.4 Communication problems and issues are raised as they arise 3.5 Identify barriers in communication to be addressed appropriately	3.1 Organization requirements for written and electronic communication methods 3.2 Effective verbal communication methods 3.3 Workplace etiquette 3.4 Communication problems and issues 3.5 Barriers in communication	3.1 Organizing information 3.2 Conveying intended meaning 3.3 Participating in a variety of workplace discussions 3.4 Complying with organization requirements for the use of written and electronic communication methods 3.5 Effective clarifying and probing skills 3.6 Identifying issues 3.7 Negotiation and communication skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Methods of communication	May include: 1.1. Non-verbal gestures 1.2. Verbal 1.3. Face-to-face 1.4. Two-way radio 1.5. Speaking to groups 1.6. Using telephone 1.7. Written 1.8. Internet
2. Workplace discussions	May include: 2.1. Coordination meetings 2.2. Toolbox discussion 2.3. Peer-to-peer discussion

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Dealt with a range of communication/information at one time 1.2. Demonstrated leadership skills in workplace communication 1.3. Made constructive contributions in workplace issues 1.4. Sought workplace issues effectively 1.5. Responded to workplace issues promptly 1.6. Presented information clearly and effectively written form 1.7. Used appropriate sources of information 1.8. Asked appropriate questions 1.9. Provided accurate information
2. Resource Implications	The following resources should be provided: 2.1. Variety of Information 2.2. Communication tools 2.3. Simulated workplace
3. Methods of Assessment	Competency in this unit must be assessed through 3.1. Case problem 3.2. Third-party report 3.3. Portfolio 3.4. Interview 3.5. Demonstration/Role-playing
4. Context for Assessment	4.1. Competency may be assessed in the workplace or in simulated workplace environment

UNIT OF COMPETENCY : LEAD SMALL TEAMS

UNIT CODE : DOE-CEM-02

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes to lead small teams including setting, maintaining and monitoring team and individual performance standards.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Provide team leadership	1.1. ***Work requirements*** are identified and presented to team members based on company policies and procedures 1.2. Reasons for instructions and requirements are communicated to team members based on company policies and procedures 1.3. ***Team members' queries and concerns*** are recognized, discussed and dealt with based on company practices	1.1 Facilitation of Team work 1.2 Company policies and procedures relating to work performance 1.3 Performance standards and expectations 1.4 Monitoring individual's and team's performance vis a vis client's and group's expectations	1.1 Communication skills required for leading teams 1.2 Group facilitation skills 1.3 Negotiating skills 1.4 Setting performance expectation
2. Assign responsibilities	2.1. Responsibilities are allocated having regard to the skills, knowledge and aptitude required to undertake the assigned task based on company policies. 2.2. Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible	2.1 Work plan and procedures 2.2 Work requirements and targets 2.2 Individual and group expectations and assignments 2.3 Ways to improve group leadership and membership	2.1 Communication skills 2.2 Management skills 2.3 Negotiating skills 2.4 Evaluation skills 2.5 Identifying team member's strengths and rooms for improvement
3. Set performance expectations for team members	3.1 Performance expectations are established based on client needs 3.2 Performance expectations are based on individual team members knowledge, skills and aptitude 3.3 Performance expectations are discussed and	3.1 One's roles and responsibilities in the team 3.2 Feedback giving and receiving 3.3 Performance expectation	3.1 Communication skills 3.2 Accurate empathy 3.3 Congruence 3.4 Unconditional positive regard 3.5 Handling of Feedback

	disseminated to individual team members		
4. Supervised team performance	4.1 Performance is ***monitored*** based on defined performance criteria and/or assignment instructions 4.2 Team members are provided with ***feedback***, positive support and advice on strategies to overcome any deficiencies based on company practices 4.3 ***Performance issues*** which cannot be rectified or addressed within the team are referenced to appropriate personnel according to employer policy 4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer needs and satisfaction 4.5 Team operations are monitored to ensure that employer/client needs and requirements are met 4.6 Follow-up communication is provided on all issues affecting the team 4.7 All relevant documentation is completed in accordance with company procedures	4.1 Performance Coaching 4.2 Performance management 4.3 Performance Issues	4.1 Communication skills required for leading teams 4.2 Coaching skill

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work requirements	May include: 1.1. Client Profile 1.2. Assignment instructions
2. Team member's concerns	May include: 2.1. Roster/shift details
3. Monitor performance	May include: 3.1. Formal process 3.2. Informal process
4. Feedback	May include: 4.1. Formal process 4.2. Informal process
5. Performance issues	May include: 5.1. Work output 5.2. Work quality 5.3. Team participation 5.4. Compliance with workplace protocols 5.5. Safety 5.6. Customer service

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Maintained or improved individuals and/or team performance given a variety of possible scenario 1.2. Assessed and monitored team and individual performance against set criteria 1.3. Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf 1.4. Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed 1.5. Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members
2. Resource Implications	The following resources should be provided: 2.1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2. Materials relevant to the proposed activity or task
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Written Examination 3.2. Oral Questioning 3.3. Portfolio
4. Context for Assessment	4.1. Competency may be assessed in actual workplace or at the designated Accredited Assessment Center

UNIT OF COMPETENCY : **APPLY CRITICAL THINKING AND PROBLEM SOLVING TECHNIQUES IN THE WORKPLACE**

UNIT CODE : **DOE-CEM-03**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem solving techniques and to determine and resolve the root cause/s of specific problems in the workplace.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Examine specific workplace challenges	1.1. Variances are examined from normal operating **parameters;** and product quality. 1.2. Extent, cause and nature of the specific problem are defined through observation, investigation and ***analytical techniques***. 1.3. ***Problems*** are clearly stated and specified.	1.1. Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations. 1.2. Competence to include the ability to apply and explain, enough for the identification of fundamental causes of specific workplace challenges. 1.3. Relevant equipment and operational processes. 1.4. Enterprise goals, targets and measures. 1.5. Enterprise quality OHS and environmental requirement. 1.6. Enterprise information systems and data collation 1.7. Industry codes and standards.	1.1. Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 1.2. Identifying extent and causes of specific challenges in the workplace.
2. Analyze the causes of specific workplace challenges.	2.1. Possible causes of specific problems are identified based on experience and the use of problem-solving tools **/** analytical techniques. 2.2. Possible cause statements are	2.1 Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to	2.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of

	developed based on findings. 2.3. Fundamental causes are identified per results of investigation conducted.	recognize non-standard situations. 2.2 Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations. 2.3 Relevant equipment and operational processes. 2.4 Enterprise goals, targets and measures. 2.5 Enterprise quality OSH and environmental requirement. 2.6 Enterprise information systems and data collation. 2.7 Industry codes and standards.	information) in examining specific challenges in the workplace. 2.2 Identifying extent and causes of specific challenges in the workplace. 2.3 Providing clear-cut findings on the nature of each identified workplace challenges.
3. Formulate resolutions to specific workplace challenges	3.1. All possible options are considered for resolution of the problem. 3.2. Strengths and weaknesses of possible options are considered. 3.3. Corrective actions are determined to resolve the problem and possible future causes. 3.4. **Action *plans*** are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures	3.1. Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations 3.2. Relevant equipment and operational processes 3.3. Enterprise goals, targets and measures 3.4. Enterprise quality OSH and environmental requirement 3.5. Principles of decision making strategies and techniques 3.6. Enterprise information systems and data collation 3.7. Industry codes and standards	3.1. Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 3.2. Identifying extent and causes of specific challenges in the workplace. 3.3. Providing clear-cut findings on the nature of each identified workplace challenges. 3.4. Devising, communicating, implementing and evaluating strategies and

			techniques in addressing specific workplace challenges.
4. Implement action plans and communicate results	4.1. Action plans are implemented and evaluated. 4.2. Results of plan implementation and recommendations are prepared. 4.3. Recommendations are presented to appropriate personnel. 4.4. Recommendations are followed-up, if required.	4.1 Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations 4.2. Relevant equipment and operational processes 4.3 Enterprise goals, targets and measures 4.4 Enterprise quality, OSH and environmental requirement 4.5 Principles of decision making strategies and techniques 4.6 Enterprise information systems and data collation 4.7 Industry codes and standards	4.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 4.2 Identifying extent and causes of specific challenges in the workplace. 4.3 Providing clear-cut findings on the nature of each identified workplace challenges. 4.4 Devising, communicating, implementing and evaluating strategies and techniques in addressing specific workplace challenges.

RANGE OF VARIABLES

VARIABLES	RANGE
1. Parameters	May include: 1.1 Processes 1.2 Procedures 1.3 Systems
2. Analytical techniques	May include: 2.1. Brainstorming 2.2. Intuitions/Logic 2.3. Cause and effect diagrams 2.4. Pareto analysis 2.5. SWOT analysis 2.6. Gant chart, Pert CPM and graphs 2.7. Scattergrams
3. Problem	May include: 3.1. Routine, non – routine and complex workplace and quality problems 3.2. Equipment selection, availability and failure 3.3. Teamwork and work allocation problem 3.4. Safety and emergency situations and incidents 3.5. Risk assessment and management
4. Action plans	May include: 4.1. Priority requirements 4.2. Measurable objectives 4.3. Resource requirements 4.4. Timelines 4.5. Co-ordination and feedback requirements 4.6. Safety requirements 4.7. Risk assessment 4.8. Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Examined specific workplace challenges. 1.2. Analyzed the causes of specific workplace challenges. 1.3. Formulated resolutions to specific workplace challenges. 1.4. Implemented action plans and communicated results on specific workplace challenges.
2. Resource Implications	2.1. Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios / case studies / what ifs will be required as well as bank of questions which will be used to probe the reason behind the observable action.
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Observation 3.2. Case Formulation 3.3. Life Narrative Inquiry 3.4. Standardized test The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.
4. Context for Assessment	4.1. In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

UNIT OF COMPETENCY : **WORK IN A DIVERSE ENVIRONMENT**

UNIT CODE : **DOE-CEM-04**

UNIT DESCRIPTOR : This unit covers the outcomes required to work effectively in a workplace characterized by diversity in terms of religions, beliefs, races, ethnicities and other differences.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop an individual's cultural awareness and sensitivity	1.1. Individual differences with clients, customers and fellow workers are recognized and respected in accordance with enterprise policies and core values. 1.2. Differences are responded to in a sensitive and considerate manner 1.3. ***Diversity*** is accommodated using appropriate verbal and non-verbal communication.	1.1. Understanding cultural diversity in the workplace 1.2. Norms of behavior for interacting and dialogue with specific groups (e. g., Muslims and other non-Christians, non-Catholics, tribes/ethnic groups, foreigners) 1.3. Different methods of verbal and non-verbal communication in a multicultural setting	1.1. Applying cross-cultural communication skills (i.e. different business customs, beliefs, communication strategies) 1.2. Showing affective skills – establishing rapport and empathy, understanding, etc. 1.3. Demonstrating openness and flexibility in communication 1.4. Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices
2. Work effectively in an environment that acknowledges and values cultural diversity	2.1 Knowledge, skills and experiences of others are recognized and documented in relation to team objectives. 2.2 Fellow workers are encouraged to utilize and share their specific qualities, skills or backgrounds with other team members and clients to enhance work outcomes. 2.3 Relations with customers and clients are maintained to show that	2.1 Value of diversity in the economy and society in terms of Workforce development 2.2 Importance of inclusiveness in a diverse environment 2.3 Shared vision and understanding of and commitment to team, departmental, and organizational goals and objectives 2.4 Strategies for customer service excellence	2.1 Demonstrating cross-cultural communication skills and active listening 2.2 Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices 2.3 Demonstrating collaboration skills

	diversity is valued by the business.		2.4 Exhibiting customer service excellence
3. Identify common issues in a multicultural and diverse environment	3.1 ***Diversity-related conflicts*** within the workplace are effectively addressed and resolved. 3.2 Discriminatory behaviors towards customers/stakeholders are minimized and addressed accordingly. 3.3 Change management policies are in place within the organization.	3.1 Value, and leverage of cultural diversity 3.2 Inclusivity and conflict resolution 3.3 Workplace harassment 3.4 Change management and ways to overcome resistance to change 3.5 Advanced strategies for customer service excellence	3.1 Addressing diversity-related conflicts in the workplace 3.2 Eliminating discriminatory behavior towards customers and co-workers 3.3 Utilizing change management policies in the workplace

RANGE OF VARIABLES

VARIABLE	RANGE
1. Diversity	This refers to diversity in both the workplace and the community and may include divergence in : 1.1 Religion 1.2 Ethnicity, race or nationality 1.3 Culture 1.4 Gender, age or personality 1.5 Educational background
2. Diversity-related conflicts	May include conflicts that result from: 2.1 Discriminatory behaviors 2.2 Differences of cultural practices 2.3 Differences of belief and value systems 2.4 Gender-based violence 2.5 Workplace bullying 2.6 Corporate jealousy 2.7 Language barriers 2.8 Individuals being differently-abled persons 2.9 Ageism (negative attitude and behavior towards old people)

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate**: 1.1 Adjusted language and behavior as required by interactions with diversity 1.2 Identified and respected individual differences in colleagues, clients and customers 1.3 Applied relevant regulations, standards and codes of practice
2. Resource Implications	**The following resources should be provided:** 2.1 Access to workplace and resources 2.2 Manuals and policies on Workplace Diversity
3. Methods of Assessment	**Competency in this unit may be assessed through**: 3.1 Demonstration or simulation with oral questioning 3.2 Group discussions and interactive activities 3.3 Case studies/problems involving workplace diversity issues 3.4 Third-party report 3.5 Written examination 3.6 Role Plays
4. Context for Assessment	Competency assessment may occur in workplace or any appropriately simulated environment

UNIT OF COMPETENCY : **PROPOSE METHODS OF APPLYING LEARNING AND INNOVATION IN THE ORGANIZATION**

UNIT CODE : **DOE-CEM-05**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to assess general obstacles in the application of learning and innovation in the organization and to propose practical methods of such in addressing organizational challenges.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess work procedures, processes and systems in terms of innovative practices	1.2. R***easons*** for innovation are incorporated to work procedures. 1.3. ***Models of innovation*** are researched. 1.4. G***aps or barriers*** to innovation in one's work area are analyzed. 1.5. Staff who can support and foster innovation in the work procedure are identified.	1.1 Seven habits of highly effective people. 1.2 Character strengths that foster innovation and learning (Christopher Peterson and Martin Seligman, 2004) 1.3 Five minds of the future concepts (Gardner, 2007). 1.4 Adaptation concepts in neuroscience (Merzenich, 2013). 1.5 Transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	1.1 Demonstrating collaboration and networking skills. 1.2 Applying basic research and evaluation skills 1.3 Generating insights on how to improve organizational procedures, processes and systems through innovation.

2. Generate practical action plans for improving work procedures, processes	2.1 Ideas for innovative work procedure to foster innovation using individual and group techniques are conceptualized 2.2 Range of ideas with other team members and colleagues are evaluated and discussed 2.3 Work procedures and processes subject to change are selected based on ***workplace requirements*** (feasible and innovative). 2.4 Practical action plans are proposed to facilitate simple changes in the work procedures, processes and systems. 2.5 ***Critical inquiry*** is applied and used to facilitate discourse on adjustments in the simple work procedures, processes and systems.	2.1 Seven habits of highly effective people. 2.2 Character strengths that foster innovation and learning (Christopher Peterson and Martin Seligman, 2004) 2.3 Five minds of the future concepts (Gardner, 2007). 2.4 Adaptation concepts in neuroscience (Merzenich, 2013). 2.5 Transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	2.1 Assessing readiness for change on simple work procedures, processes and systems. 2.2 Generating insights on how to improve organizational procedures, processes and systems through innovation. 2.3 Facilitating action plans on how to apply innovative procedures in the organization.

3. Evaluate the effectiveness of the proposed action plans	3.1 Work structure is analyzed to identify the impact of the new work procedures 3.2 Co-workers/key personnel is consulted to know who will be involved with or affected by the work procedure 3.3 Work instruction operational plan of the new work procedure is developed and evaluated. 3.4 Feedback and suggestion are recorded. 3.5 Operational plan is updated. 3.6 Results and impact on the developed work instructions are reviewed 3.7 Results of the new work procedure are evaluated 3.8 Adjustments are recommended based on results gathered	3.1 Five minds of the future concepts (Gardner, 2007). 3.2 Adaptation concepts in neuroscience (Merzenich, 2013). 3.3 Transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	3.1 Generating insights on how to improve organizational procedures, processes and systems through innovation. 3.2 Facilitating action plans on how to apply innovative procedures in the organization. 3.3 Communicating results of the evaluation of the proposed and implemented changes in the workplace procedures and systems. 3.4 Developing action plans for continuous improvement on the basic systems, processes and procedures in the organization.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Reasons	May include: 1.1. Strengths and weaknesses of the current systems, processes and procedures. 1.2. Opportunities and threats of the current systems, processes and procedures.
2. Models of innovation	May include: 2.1. Seven habits of highly effective people. 2.2. Five minds of the future concepts (Gardner, 2007). 2.3. Neuroplasticity and adaptation strategies.
3. Workplace requirements	May include: 3.1. Feasible 3.2. Innovative
4. Gaps or barriers	May include: 4.1. Machine 4.2. Manpower 4.3. Methods 4.4. Money
5. Critical Inquiry	May include: 5.1. Preparation. 5.2. Discussion. 5.3. Clarification of goals. 5.4. Negotiate towards a Win-Win outcome. 5.5. Agreement. 5.6. Implementation of a course of action. 5.7. Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 5.8. Listening. 5.9. Reducing misunderstandings is a key part of effective negotiation. 5.10. Rapport Building. 5.11. Problem Solving. 5.12. Decision Making. 5.13. Assertiveness. 5.14. Dealing with Difficult Situations.

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Established the reasons why innovative systems are required 1.2 Established the goals of a new innovative system 1.3 Analyzed current organizational systems to identify gaps and barriers to innovation. 1.4 Assessed work procedures, processes and systems in terms of innovative practices. 1.5 Generated practical action plans for improving work procedures, and processes. 1.6 Reviewed the trial innovative work system and adjusted reflect evaluation feedback, knowledge management systems and future planning. 1.7 Evaluated the effectiveness of the proposed action plans.
2. Resource Implications	The following resources should be provided: 2.1 Pens, papers and writing implements. 2.2 Cartolina. 2.3 Manila papers.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Psychological and behavioral Interviews. 3.2 Performance Evaluation. 3.3 Life Narrative Inquiry. 3.4 Review of portfolios of evidence and third-party workplace reports of on-the-job performance. 3.5 Sensitivity analysis. 3.6 Organizational analysis. 3.7 Standardized assessment of character strengths and virtues applied.
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in accredited institutions.

UNIT OF COMPETENCY : **USE INFORMATION SYSTEMATICALLY**

UNIT CODE : **DOE-CEM-06**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use technical information systems, apply information technology (IT) systems and edit, format & check information.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Use technical information	1.1. ***Information*** are collated and organized into a suitable form for reference and use 1.2. Stored information are classified so that it can be quickly identified and retrieved when needed 1.3. Guidance are advised and offered to people who need to find and use information	1.1. Application in collating information 1.2. Procedures for inputting, maintaining and archiving information 1.3. Guidance to people who need to find and use information 1.4. Organize information 1.5. classify stored information for identification and retrieval 1.6. Operate the technical information system by using agreed procedures	1.1. Collating information 1.2. Operating appropriate and valid procedures for inputting, maintaining and archiving information 1.3. Advising and offering guidance to people who need to find and use information 1.4. Organizing information into a suitable form for reference and use 1.5. Classifying stored information for identification and retrieval 1.6. Operating the technical information system by using agreed procedures
2. Apply information technology (IT)	2.1. ***Technical information*** system is operated using agreed procedures 2.2. Appropriate and valid procedures are operated for inputting, maintaining and archiving information 2.3. ***Software*** required are utilized to execute the project activities 2.4. Information and data obtained are handled, edited, formatted and	2.1. Attributes and limitations of available software tools 2.2. Procedures and work instructions for the use of IT 2.3. Operational requirements for IT systems 2.4. Sources and flow paths of data 2.5. Security systems and measures that can be used	2.1. Identifying attributes and limitations of available software tools 2.2. Using procedures and work instructions for the use of IT 2.3. Describing operational requirements for IT systems

	checked from a range of internal and external ***sources*** 2.5. Information are extracted, entered, and processed to produce the outputs required by ***customers*** 2.6. Own skills and understanding are shared to help others 2.7. Specified ***security measures*** are implemented to protect the confidentiality and integrity of project data held in IT systems	2.6. Extract data and format reports 2.7. Methods of entering and processing information 2.8. WWW enabled applications	2.4. Identifying sources and flow paths of data 2.5. Determining security systems and measures that can be used 2.6. Extracting data and format reports 2.7. Describing methods of entering and processing information 2.8. Using WWW applications
3. Edit, format and check information	3.1 Basic editing techniques are used 3.2 Accuracy of documents are checked 3.3 Editing and formatting tools and techniques are used for more complex documents 3.4 Proof reading techniques is used to check that documents look professional	3.1 Basic file-handling techniques 3.2 Techniques in checking documents 3.3 Techniques in editing and formatting 3.4 Proof reading techniques	3.1 Using basic file-handling techniques is used for the software 3.2 Using different techniques in checking documents 3.3 Applying editing and formatting techniques 3.4 Applying proof reading techniques

RANGE OF VARIABLES

VARIABLE	RANGE
1. Information	May include: 1.1. Property 1.2. Organizational 1.3. Technical reference
2. Technical information	May include: 2.1. paper based 2.2. electronic
3. Software	May include: 3.1. spreadsheets 3.2. databases 3.3. word processing 3.4. presentation
4. Sources	May include: 4.1. other IT systems 4.2. manually created 4.3. within own organization 4.4. outside own organization 4.5. geographically remote
5. Customers	May include: 5.1. colleagues 5.2. company and project management 5.3. clients
6. Security measures	May include: 6.1. access rights to input; 6.2. passwords; 6.3. access rights to outputs; 6.4. data consistency and back-up; 6.5. recovery plans

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Used technical information systems and information technology 1.2. Applied information technology (IT) systems 1.3. Edited, formatted and checked information
2. Resource Implications	The following resources should be provided: 2.1. Computers 2.2. Software and IT system
3. Methods of Assessment	Competency in this unit MUST be assessed through: 3.1. Direct Observation 3.2. Oral interview and written test
4. Context for Assessment	4.1. Competency may be assessed individually in the actual workplace or through accredited institution

1.5.1.1.

UNIT OF COMPETENCY : EVALUATE OCCUPATIONAL SAFETY AND HEALTH WORK PRACTICES

UNIT CODE : DOE-CEM-07

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to interpret Occupational Safety and Health practices, set OSH work targets, and evaluate effectiveness of Occupational Safety and Health work instructions

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret Occupational Safety and Health practices	1.1 ***OSH work practices issues*** are identified relevant to work requirements 1.2 OSH work standards and procedures are determined based on applicability to nature of work 1.3 Gaps in work practices are identified related to relevant OSH work standards	1.1. OSH work practices issues 1.2. OSH work standards 1.3. General OSH principles and legislations 1.4. Company/ workplace policies/ guidelines 1.5. Standards and safety requirements of work process and procedures	1.1. Communication skills 1.2. Interpersonal skills 1.3. Critical thinking skills 1.4. Observation skills
2. Set OSH work targets	2.1 Relevant work information are gathered necessary to determine OSH work targets 2.2 ***OSH Indicators*** based on gathered information are agreed upon to measure effectiveness of workplace OSH policies and procedures 2.3 Agreed OSH indicators are endorsed for approval from appropriate personnel 2.4 ***OSH work instructions*** are received in accordance with workplace policies and procedures*	2.1. OSH work targets 2.2. OSH Indicators 2.3. OSH work instructions 2.4. Safety and health requirements of tasks 2.5. Workplace guidelines on providing feedback on OSH and security concerns 2.6. OSH regulations Hazard control procedures 2.7. OSH trainings relevant to work	2.1. Communication skills 2.2. Collaborating skills 2.3. Critical thinking skills 2.4. Observation skills
3. Evaluate effectiveness of Occupational Safety and Health work instructions	3.1 OSH Practices are observed based on workplace standards 3.2 Observed OSH practices are measured against approved ***OSH metrics*** 3.3 Findings regarding effectiveness are assessed and gaps identified are implemented based on OSH work standards	3.1. OSH Practices 3.2. OSH metrics 3.3. OSH Evaluation Techniques 3.4. OSH work standards	3.1. Critical thinking skills 3.2. Evaluating skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Work Practices Issues	May include: 1.1 Workers' experience/observance on presence of work hazards 1.2 Unsafe/unhealthy administrative arrangements (prolonged work hours, no break-time, constant overtime, scheduling of tasks) 1.3 Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/ guidelines
2. OSH Indicators	May include: 2.1 Increased of incidents of accidents, injuries 2.2 Increased occurrence of sickness or health complaints/symptoms 2.3 Common complaints of workers' related to OSH 2.4 High absenteeism for work-related reasons
3. OSH Work Instructions	May include: 3.1 Preventive and control measures**,** and targets 3.2 Eliminate the hazard (i.e., get rid of the dangerous machine 3.3 Isolate the hazard (i.e. keep the machine in a closed room and operate it remotely; barricade an unsafe area off) 3.4 Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one) 3.5 Use administrative controls to reduce the risk (i.e. give trainings on how to use equipment safely; OSH-related topics, issue warning signages, rotation/shifting work schedule) 3.6 Use engineering controls to reduce the risk (i.e. use safety guards to machine) 3.7 Use personal protective equipment 3.8 Safety, Health and Work Environment Evaluation 3.9 Periodic and/or special medical examinations of workers
4. OSH metrics	May include: 4.1 Statistics on incidence of accidence and injuries 4.2 Morbidity (Type and Number of Sickness) 4.3 Mortality (Cause and Number of Deaths) 4.4 Accident Rate

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Identify OSH work practices issues relevant to work requirements 1.2. Identify gaps in work practices related to relevant OSH work standards 1.3. Agree upon OSH Indicators based on gathered information to measure effectiveness of workplace OSH policies and procedures 1.4. Receive OSH work instructions in accordance with workplace policies and procedures 1.5. Compare Observed OSH practices with against approved OSH work instructions 1.6. Assess findings regarding effectiveness based on OSH work standards
2. Resource Implications	**The following resources should be provided:** 2.1 Facilities, materials, tools and equipment necessary for the activity
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Observation/Demonstration with oral questioning 3.2 Third party report 3.3 Written exam
4. Context for Assessment	4.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : **EVALUATE ENVIRONMENTAL WORK PRACTICES**
UNIT CODE : **DOE-CEM-08**
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude to interpret environmental Issues, establish targets to evaluate environmental practices and evaluate effectiveness of environmental practices

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret environmental practices, policies and procedures	1.1 ***Environmental work practices*** issues are identified relevant to work requirements 1.2 Environmental Standards and Procedures nature of work are determined based on Applicability to nature of work 1.3 Gaps in work practices related to Environmental Standards and Procedures are identified	1.1 Environmental Issues 1.2 Environmental Work Procedures 1.3 Environmental Laws 1.4 Environmental Hazardous and Non-Hazardous Materials 1.5 Environmental required license, registration or certification	1.1. Analyzing Environmental Issues and Concerns 1.2. Critical thinking 1.3. Problem Solving 1.4. Observation Skills
2. Establish targets to evaluate environmental practices	2.1. Relevant information is gathered necessary to determine environmental work targets 2.2. ***Environmental Indicators*** based on gathered information are set to measure environmental work targets 2.3. Indicators are verified with appropriate personnel	2.1. Environmental Indicators 2.2. Relevant Environment Personnel or expert 2.3. Relevant Environmental Trainings and Seminars	2.1. Investigative Skills 2.2. Critical thinking 2.3. Problem Solving 2.4. Observation Skills
3. Evaluate effectiveness of environmental practices	3.1. Work environmental practices are recorded based on workplace standards 3.2. Recorded work environmental practices are compared against planned indicators 3.3. Findings regarding effectiveness are assessed and gaps identified are implemented based on environment work standards and procedures 3.4. Results of environmental assessment are conveyed to appropriate personnel	1.1. Environmental Practices 1.2. Environmental Standards and Procedures	3.1 Documentation and Record Keeping Skills 3.2 Critical thinking 3.3 Problem Solving 3.4 Observation Skills

RANGE OF VARIABLES

VARIABLE	R A N G E
1. Environmental Practices Issues	May include: 1.1 Water Quality 1.2 National and Local Government Issues 1.3 Safety 1.4 Endangered Species 1.5 Noise 1.6 Air Quality 1.7 Historic 1.8 Waste 1.9 Cultural
2. Environmental Indicators	May include: 2.1 Noise level 2.2 Lighting (Lumens) 2.3 Air Quality - Toxicity 2.4 Thermal Comfort 2.5 Vibration 2.6 Radiation 2.7 Quantity of the Resources 2.8 Volume

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Identified environmental issues relevant to work requirements 1.2. Identified gaps in work practices related to Environmental Standards and Procedures 1.3. Gathered relevant information necessary to determine environmental work targets 1.4. Set environmental indicators based on gathered information to measure environmental work targets 1.5. Recorded work environmental practices are recorded based on workplace standards 1.6. Conveyed results of environmental assessment to appropriate personnel
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace/Assessment location 2.2 Legislation, policies, procedures, protocols and local ordinances relating to environmental protection 2.3 Case studies/scenarios relating to environmental protection
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written/ Oral Examination 3.2 Interview/Third Party Reports 3.3 Portfolio (citations/awards from GOs and NGOs, certificate of training – local and abroad) 3.4 Simulations and role-plays
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated center.

UNIT OF COMPETENCY : **FACILITATE ENTREPRENEURIAL SKILLS**
UNIT CODE : **DOE-CEM-09**
UNIT DESCRIPTOR : This unit covers the outcomes required to build, operate and grow a micro/small-scale enterprise.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop and maintain micro-small-medium enterprise (MSMEs) skills in the organization	1.1 Appropriate ***business strategies*** are determined and set for the enterprise based on current and emerging business environment. 1.2 ***Business operations*** are monitored and controlled following established procedures. 1.3 Quality assurance measures are implemented consistently. 1.4 Good relations are maintained with staff/workers. 1.5 Policies and procedures on occupational safety and health and environmental concerns are constantly observed.	1.1 Business models and strategies 1.2 Types and categories of businesses 1.3 Business operation 1.4 Basic Bookkeeping 1.5 Business internal controls 1.6 Basic quality control and assurance concepts 1.7 Government and regulatory processes	1.1 Basic bookkeeping/ accounting skills 1.2 Communication skills 1.3 Building relations with customer and employees 1.4 Building competitive advantage of the enterprise
2. Establish and Maintain client-base/market	2.1 Good customer relations are maintained 2.2 New customers and markets are identified, explored and reached out to. 2.3 Promotions/Incentives are offered to loyal customers 2.4 Additional products and services are evaluated and tried where feasible. 2.5 ***Promotional/advertising initiatives*** are carried out where necessary and feasible.	2.1 Public relations concepts 2.2 Basic product promotion strategies 2.3 Basic market and feasibility studies 2.4 Basic business ethics	2.1 Building customer relations 2.2 Individual marketing skills 2.3 Using basic advertising (posters/ tarpaulins, flyers, social media, etc.)
3. Apply budgeting and financial management skills	3.1 Enterprise is built up and sustained through judicious control of cash flows. 3.2 Profitability of enterprise is ensured though appropriate ***internal controls***. 3.3 Unnecessary or lower-priority expenses and purchases are avoided.	3.1 Cash flow management 3.1 Basic financial management 3.2 Basic financial accounting 3.3 Business internal controls	3.1 Setting business priorities and strategies 3.2 Interpreting basic financial statements 3.3 Preparing business plans

RANGE OF VARIABLES

VARIABLE	RANGE
1. Business strategies	May include: 1.1. Developing/Maintaining niche market 1.2. Use of organic/healthy ingredients 1.3. Environment-friendly and sustainable practices 1.4. Offering both affordable and high-quality products and services 1.5. Promotion and marketing strategies (e. g., on-line marketing)
2. Business operations	May include: 2.1 Purchasing 2.2 Accounting/Administrative work 2.3 Production/Operations/Sales
3. Internal controls	May include: 3.1 Accounting systems 3.2 Financial statements/reports 3.3 Cash management
4. Promotional/ Advertising initiatives	May include: 4.1 Use of tarpaulins, brochures, and/or flyers 4.2 Sales, discounts and easy payment terms 4.3 Use of social media/Internet 4.4 "Service with a smile" 4.5 Extra attention to regular customers

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate :** 1.1. Demonstrated basic entrepreneurial skills 1.2. Demonstrated ability to conceptualize and plan a micro/small enterprise 1.3. Demonstrated ability to manage/operate a micro/small-scale business
2. Resource Implications	The following resources should be provided: 2.1. Simulated or actual workplace 2.2. Tools, materials and supplies needed to demonstrate the required tasks 2.3. References and manuals
3. Methods of Assessment	**Competency in this unit may be assessed through :** 3.1. Written examination 3.2. Demonstration/observation with oral questioning 3.3. Portfolio assessment with interview 3.4. Case problems
4. Context of Assessment	4.1. Competency may be assessed in workplace or in a simulated workplace setting 4.2. Assessment shall be observed while tasks are being undertaken whether individually or in-group

COMMON COMPETENCIES

UNIT TITLE : **ENERGY MANAGEMENT SYSTEM (ISO 50001 OR SIMILAR FRAMEWORK) BASIC AWARENESS**

UNIT CODE : **DOE-CEM-10**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to develop and implement programs, projects and activities, manage and monitor energy consumption operated under the principles of an energy management system standard.

ELEMENT	PERFORMANCE CRITERIA (*Italicized* terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Understanding Energy Management System (ISO 50001 or similar framework) Standards and Guides	1.1 The different processes and steps on energy management system are identified following ISO 50001 or similar framework 1.2 Essential elements for a successful implementation of energy management system are identified	1.1 ISO 50001 Energy Management System Standards and Guide 1.2 Company business processes and operating procedures	1.1 Coordination, team building, organizing, communication, writing and presentation

RANGE OF VARIABLES

VARIABLE	RANGE
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

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
Areas for energy saving (Energy Cost Centers)	Energy Cost Centers may include: 1.1. Administration Building 1.2. Production area 1.3. Packaging Area 1.4. HVAC Systems 1.5. Power Generation

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 5.1. Accessed information concerning Energy management systems, Energy efficiency programs and policies 5.2. Implemented and monitored procedures concerning energy usage 5.3. Implemented and monitored energy management procedures following the PDCA cycle
2. Resource implications	The following resources should be provided: 6.1. Energy Management Systems procedural manual and trainings. 6.2. Energy Laws and Regulations on Energy Efficiency and Energy Conservation 6.3. Appropriate energy measuring equipment 6.4. Applicable PPE 6.5. Appropriate installation tools (i.e. pliers, screwdrivers, etc.) 6.6. Workplace or assessment area
3. Methods of assessment	Competency in this unit may be assessed through: Direct evaluation of energy management performance monitoring and control 7.1. Demonstration/Observation with oral questioning 7.2. Written test 7.3. Use of methods of measurements and verification for the implementation of energy efficiency and conservation projects
8. Context of assessment	8.1. Competency assessment must be undertaken in accordance with the endorsed assessment guidelines 8.1. Assessment may be conducted in the workplace.

UNIT TITLE : ENERGY AUDIT (ISO 5002 OR SIMILAR FRAMEWORK) BASIC AWARENESS

UNIT CODE : DOE-CEM-11

UNIT 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 *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Understanding Energy Audit (ISO50002 or similar framework) Requirements and Guide	1.1 The audit principles and the different audit processes, types, methods and steps are identified following ISO 50002 or similar framework 1.2 Essential elements for a successful implementation of energy audit are identified	1.1 ISO 50002 Energy Audit Requirements and Guidance 1.2 Company business processes and operating procedures	1.1 Coordination, team building, organizing, communication, writing and presentation

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 set points 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 Accredited Assessment Center.

UNIT OF COMPETENCY: **INDUSTRY RULES AND REGULATIONS AWARENESS**

UNIT CODE **:** **DOE-CEM-12**

UNIT DESCRIPTOR **:** This unit provides understanding of the RA 11825 EEC-IRR Requirements and relevant Environmental and Climate Change Policies.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Understanding the EEC Law, its IRR and related DOE MC and DO	1.1 The EEC Law, its IRR and other related standards, guides and regulatory compliances are completely identified 1.2 Assessment of the rules and regulations, its implications, requirements, risk and repercussions are identified and communicated to the owner/clients	1.1 RA 11285 EEC Law, IRR, related MCs and DOs from DOE, others 1.2 Company business processes and operating procedures; Above rules and regulations including penalties, rewards and incentives	1.1 Coordination, team building, organizing, communication, writing and presentation
2 Understanding other related and complementary rules and regulation related to EEC	1.1 Other related rules and regulations are identified (Renewable Energy Act, Environmental Protection, ERC rules, etc.) 1.2 Assessment of the rules and regulations, its implications, requirements, risk and repercussions are identified and communicated to the owner/clients	1.1 Renewable Energy Act, Environmental Protection, ERC ruling, and others 1.2 Company business processes and operating procedures; Above rules and regulations including penalties, rewards and incentives	1.1 Coordination, team building, organizing, communication, writing and presentation

RANGE OF VARIABLES

VARIABLE	RANGE
Information	Information/documents may include: 1.13. Workplace procedures and practices related to energy consumption, including all financial, operating and customer service policies and procedures 1.14. Occupational Health & Safety 1.15. Regulations for Compliance 1.16. Workplace housekeeping procedures and policies

	1.17. Code of practice for energy management system 1.18. Policies and procedures for equipment and devices used in the workspace 1.19. Manufacturer's instructions concerning the use and servicing of equipment 1.20. Plans, Objectives and Targets 1.21. Documentation, Review 1.22. Monitoring and Control 1.23. Checking for Corrective Actions 1.24. Management Review
Appropriate personnel	Appropriate personnel may include: 2.5. Workplace personnel including supervisors and management 2.6. Site Engineers 2.7. Contractors 2.8. Operators and Maintenance personnel
Areas for energy saving (Energy Cost Centers)	Energy Cost Centers may include: 1.6. Administration Building 1.7. Production area 1.8. Packaging Area 1.9. HVAC Systems 1.10. Power Generation

EVIDENCE GUIDE

4. Critical aspects of competency	Assessment requires that the candidate: 5.4. Accessed information concerning Energy management systems, Energy efficiency programs and policies 5.5. Implemented and monitored procedures concerning energy usage
5. Resource implications	The following resources should be provided: 6.7. Energy Management Systems procedural manual and trainings. 6.8. Energy Laws and Regulations on Energy Efficiency and Energy Conservation 6.9. Appropriate energy measuring equipment 6.10. Applicable PPE 6.11. Appropriate installation tools (i.e. pliers, screwdrivers, etc.) 6.12. Workplace or assessment area
6. Methods of assessment	Competency in this unit may be assessed through: Direct evaluation of energy management performance monitoring and control 8.2. Demonstration/Observation with oral questioning 8.3. Written test 8.4. Use of methods of measurements and verification for the implementation of energy efficiency and conservation projects
9. Context of assessment	8.2. Competency assessment must be undertaken in accordance with the endorsed assessment guidelines 9.1. Assessment may be conducted in the workplace.

UNIT OF COMPETENCY : OPERATE AND MAINTAIN TOOLS AND EQUIPMENT FOR MONITORING, TESTING AND TECHNICAL AUDIT

UNIT CODE : DOE-CEM-13

DESCRIPTOR : This unit covers the knowledge, skills and attitude to operate and maintain tools and equipment. This unit will involve working in a team environment.

ELEMENT	PERFORMANCE CRITERIA (***Italicized Bold*** terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1. Work instruction is secured and interpreted according to job requirements 1.2. Relevant ***occupational health and safety requirements*** are identified following job specifications 1.3. Relevant transmission line ***tools, equipment and hardware*** are identified and requested in accordance with job specifications	1.1. Relevant occupational health and safety standards 1.2. Types and usage of tools and equipment 1.3. Basic preventive maintenance servicing for equipment	1.1. Following and complying occupational health and safety standards 1.2. Following procedures for the safe use of tools and equipment 1.3. Performing basic preventive maintenance servicing for equipment
2. Prepare tools and equipment	2.1. Personal protective equipment (PPE) are obtained following job requirements 2.2. Tools, equipment and hardware are acquired and secured in line with job requirements 2.3. Tools are tested/set following manufacturer's standards or recommendation	2.1. Types and functions of PPEs 2.2. Types and usage of tools and equipment 2.3. Basic preventive maintenance servicing for equipment 2.4. Proper testing of tools	2.1. Following and complying occupational health and safety standards 2.2. Following procedures for the safe use of tools and equipment 2.3. Performing basic preventive maintenance servicing for equipment 2.4. Testing skills
3. Operate tools and equipment	3.1. PPE are used in line with job requirements 3.2. Tools and equipment are used in line with job requirements	3.1. Proper usage of PPEs 3.2. Proper procedure for the use of tools and equipment 3.3. Basic preventive maintenance	3.1. Using PPEs 3.2. Following procedures for the safe use of tools and equipment 3.3. Performing basic preventive maintenance

		servicing for equipment	servicing for equipment
4. Check condition of tools and equipment	4.1. Tools and equipment are identified according to classification and job requirements 4.2. Non-functional tools and equipment are segregated and labeled according to classification 4.3. Safety of tools and equipment are observed in accordance with manufacturer's instructions 4.4. Condition of PPE are checked in accordance with manufacturer's instructions	4.1. Classification of tools and equipment 4.2. Proper safety procedure for the use of tools and equipment 4.3. Basic preventive maintenance servicing for equipment	4.1. Classifying tools and equipment 4.2. Following and complying occupational health and safety standards 4.3. Following procedures for the safe use of tools and equipment 4.4. Performing basic preventive maintenance servicing for equipment
5. Perform basic preventive maintenance	5.1. Appropriate lubricants are identified according to types of equipment 5.2. Equipment are lubricated according to preventive maintenance schedule or manufacturer's specifications 5.3. Tools are cleaned and tested according to standard procedures 5.4. Tools and equipment are inspected, and repaired and replaced, if necessary, after use 5.5. Work place is cleaned and kept in safe state in line with OHSA regulations	5.1. Types and usage of lubricants for equipment 5.2. Proper procedure for the use and maintenance of tools and equipment 5.3. Basic preventive maintenance servicing for equipment 5.4. Applicable OHSA regulations in preventive maintenance	5.1. Identifying types and usage of lubricants 5.2. Following procedures for the safe use and maintenance of tools and equipment 5.3. Performing basic preventive maintenance servicing for equipment 5.4. Following OHSA regulations
6. Store tools and equipment	6.1. Inventory of tools and equipment are conducted and recorded as per company practices 6.2. Tools and equipment are stored safely in appropriate locations in accordance with manufacturer's specifications or company procedures	6.1. Proper procedure for the inventory and storage of tools and equipment	6.1. Following procedures for the inventory and storage of tools and equipment 6.2. Inventory skills 6.3. Proper storage and handling skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Occupational health and safety requirements	May include but not limited to: 1.1. Personal protective equipment (PPE) 1.1.1 Safety hat 1.1.2 Safety goggles 1.1.3 Safety gloves 1.1.4 Safety shoes 1.1.5 Working clothes 1.2. Installation of grounding cluster
2. Tools, equipment and hardware	May include but not limited to: 2.1. Hand tools 2.1.1. Pliers 2.1.2. Screwdrivers 2.1.3. Adjustable wrenches 2.1.4. Ball peen hammer 2.1.5. Auger bit 2.1.6. Hacksaw/cutting tools 2.1.7. Steel tape 2.2. Equipment 2.2.1. Motorized capstan 2.2.2. Climbing gears 2.2.3. Line truck/Boom truck 2.3. Set of hot line trailer 2.4. Hardware 2.4.1. Insulator 2.4.2. Machine bolts 2.4.3. Suspension clamp assembly (ACSR/OHGW) 2.4.4. Strain clamp assembly(ACSR/OHGW) 2.4.5. Overhead ground wires 2.4.6. Cross-arms and braces 2.4.7. Conductors and accessories

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Demonstrates ability to identify and comply with occupational health and safety standards in operating and maintaining tools and equipment 1.2. Demonstrates ability to identify and safely use tools and equipment 1.3. Demonstrates ability to perform basic preventive maintenance servicing for equipment
2. Resource Implications	The following resources must be available: 2.1. Tools, equipment and PPE 2.2. Work area
3. Method of assessment	3.1. Observation and Oral questioning 3.2. Demonstration with oral questioning 3.3. Written test
4. Context of assessment	4.1. Competency may be assessed in the workplace or in a simulated workplace setting 4.2. Assessment shall be undertaken either individually or part of team under limited supervision

CORE COMPETENCIES

UNIT OF COMPETENCY: **ENERGY MANAGEMENT SYSTEM DEVELOPMENT AND IMPLEMENTATION**

UNIT CODE **:** **DOE-CEM-14**

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 *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Organizing for the Implementation of Energy Management System	1.1. Energy management policy and guidance are established 1.2. Energy Management Team, roles and responsibilities, performance expectations and goals are established 1.3. Energy management processes and guides are adopted and agreed 1.4. Relevant information and provisions on energy management related regulations and compliance requirements from DOE are obtained	2.1. Company policies, business processes and operating procedures; table of organization, roles and responsibilities. 2.2. ISO 50001 Energy Management System Standards and Guide 2.3. Power industry and regulatory framework; DOE/ERC rules and regulations on EEC, etc	1.11. Coordination, team building, organizing, communication, writing and presentation 1.12. Analytical, writing and presentation 1.13. Research, coordination, writing and presentation
2. Energy Planning and Review	2.1 List of all energy resources, users, contracts, cost drivers, consumption drivers are identified 2.2 Modes of energy data gathering, collection, storage and security are defined and established 2.3 Significant energy users, patterns, trends and usage profile are obtained and established	2.1 Inventory of company's energy asset and resources, materials and equipment specifications, energy contract terms of reference and OEM manual of operation	2.1 Research, coordination, writing and presentation 2.2 Coordination, analytical, communication, writing and presentation 2.3 Coordination, analytical, communicatio

	2.4 Opportunities for improvement are established and identified thru data analysis and technical audit 2.5 Energy baseline, energy baseload, energy performance indicators and goals are determined and established 2.6 Energy program, projects and action plans are established, communicated and agreed by stakeholders	2.2 Energy metering and instrumentation, installation and calibration, data retrieval and storage 2.3 Equipment specifications and usage, statistical tools and technique, data analytics 2.4 Equipment specifications and usage, technical audit methodology and industry benchmarks 2.5 ISO 50001 Energy Management System Standards and Guide, Statistical tools and technique, Planning and Goal Setting 2.6 ISO 50001 Energy Management System Standards and Guide, Statistical tools and technique, Planning and Goal Setting, Budgeting guidelines	n, writing and presentation 2.4 Coordination, analytical, communication, writing and presentation 2.5 Coordination, analytical, communication, writing and presentation 2.6 Coordination, analytical, communication, writing and presentation
3. Energy Program Implementation, Operation, Monitoring and Continuous Improvement	3.1 Energy programs, projects and action plans are implemented and monitored against its objectives and goals 3.2 Concerned personnel are oriented and trained on Energy Management and related systems and technologies 3.3 Production processes and operation are evaluated for energy efficiency improvement	3.1 Company policies, business processes and operating procedures; Programs and project management 3.2 HR policies and guide 3.3 Company production process flowchart,	3.1 Project management, analytical, writing and presentation 3.2 Coordination, analytical, communication, writing and presentation 3.3 Coordination, analytical, communication

	3.4 Procurement of energy resources, equipment, materials and devices are evaluated based on efficiency and lifecycle cost 3.5 Necessary energy reports (energy data, project/plan accomplishments, energy performance results, issues, lessons learned, areas for improvements and regulatory reports, etc) are periodically done	process and equipment settings, supplychain, statistical process control and standards 3.4 Company procurement policies, technical and financial evaluation process, industry benchmark, vendor management 3.5 DOE/ERC rules and regulations on EEC annual reporting, ISO 50001 Energy Management System Standards and Guide, etc	, writing and presentation 3.4 Coordination, analytical, communication , writing and presentation 3.5 Coordination, analytical, communication , writing and presentation

RANGE OF VARIABLES

VARIABLE	RANGE
1. Information	Information/documents may include: 1.25. Workplace procedures and practices related to energy consumption, including all financial, operating and customer service policies and procedures 1.26. Occupational Health & Safety 1.27. Regulations for Compliance 1.28. Workplace housekeeping procedures and policies 1.29. Code of practice for energy management system 1.30. Policies and procedures for equipment and devices used in the workspace 1.31. Manufacturer's instructions concerning the use and servicing of equipment 1.32. Plans, Objectives and Targets 1.33. Documentation, Review 1.34. Monitoring and Control 1.35. Checking for Corrective Actions 1.36. Management Review
2. Appropriate personnel	Appropriate personnel may include: 2.9. Workplace personnel including supervisors and management 2.10. Site Engineers 2.11. Contractors 2.12. Operators and Maintenance personnel
3. Areas for energy saving (Energy Cost Centers)	Energy Cost Centers may include: a. Administration Building b. Production area c. Packaging Area d. HVAC Systems e. 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

EVIDENCE GUIDE

5. Critical aspects of competency	Assessment requires that the candidate: 5.6. Accessed information concerning Energy management systems, Energy efficiency programs and policies 5.7. Implemented and monitored procedures concerning energy usage 5.8. Implemented and monitored energy management procedures following the PDCA cycle
6. Resource implications	The following resources should be provided: 6.13. Energy Management Systems procedural manual and trainings. 6.14. Energy Laws and Regulations on Energy Efficiency and Energy Conservation 6.15. Appropriate energy measuring equipment 6.16. Applicable PPE 6.17. Appropriate installation tools (i.e. pliers, screwdrivers, etc.) 6.18. Workplace or assessment area
7. Methods of assessment	Competency in this unit may be assessed through: Direct evaluation of energy management performance monitoring and control 9.2. Demonstration/Observation with oral questioning 9.3. Written test 9.4. Use of methods of measurements and verification for the implementation of energy efficiency and conservation projects
9. Context of assessment	9.1. Competency assessment must be undertaken in accordance with the endorsed assessment guidelines 9.5. Assessment may be conducted in the workplace.

UNIT OF COMPETENCY : **PLAN AND ORGANIZE ENERGY AUDIT (BASIC ENERGY AUDIT: ELECTRICAL, MECHANICAL, AND THERMAL)**

UNIT CODE : **DOE-CEM-15**

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 (***Italicized Bold*** terms are elaborated in the range of variables)	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. Site inspection is conducted based on energy audit plan 2.3. Data collection and ***measurement*** plan are implemented based on the 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	2.1. 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

	2.6. Conduct of audit are monitored up to closing meeting and made sure audit plan is followed within the time frame	2.6. Estimates of manpower and budget required 2.7. External auditors' proper credentials and track record.	instrumentation needed
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

5. Critical aspects of competency	Assessment requires evidence that the candidate: 5.1. Plan and schedule energy audit 5.1.1. Prepared audit plan based on coordination with different divisions/plants 5.1.2. Approved and communicated final schedule for resource requirements 5.2. Implement energy audit 5.2.1. Conducted meeting is conducted in accordance with the energy audit plan 5.2.2. Implemented data collection and measurement plan based on the energy audit plan 5.2.3. Analyzed data using statistical tools and techniques 5.3. Develop and recommend strategies for improving energy efficiency 5.3.1. Developed strategies based on the outcome of the audit findings 5.3.2. Prepared recommendation for energy use reduction strategy based on the results of the audit 5.3.3. Proposed recommendation for opportunities for improvement based on the results of the audit
6. Resource Implications	The following resources should be provided: 6.1. Appropriate energy measuring equipment 6.2. Applicable PPE 6.3. Appropriate energy audit tools 6.4. Workplace or assessment area: actual place of audit
7. Method of assessment	Competency in this unit may be assessed through: 7.1. Demonstration/Observation with oral questioning 7.2. Written test 7.3. Portfolio
8. Context of assessment	8.1. Competency maybe assessed in actual workplace or at the designated DOE Accredited Assessment Center.

UNIT OF COMPETENCY : TECHNICAL COMPETENCIES

UNIT CODE : DOE-CEM-16

DESCRIPTOR : This unit covers the knowledge on the technical aspect of a CEM towards the operation and maintenance of Electrical, Mechanical and Lighting systems

ELEMENT	PERFORMANCE CRITERIA (***Italicized*** terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Electrical Systems	1.1. Electrical system management policy and guidance are established 1.2. Electrical Operation and Maintenance Team, roles and responsibilities, performance expectations and goals are established 1.3. Electrical Operation and Maintenance processes and guides are adopted and agreed 1.4. Relevant information and provisions on Electrical Operation and Maintenance related regulations and compliance requirements from DOE are obtained	1.1. Company policies, business processes and operating procedures; table of organization, roles and responsibilities. 1.2. Electrical System Standards and Guide 1.3. Philippine Electrical Code (PEC) standards, etc.	1.1. Coordination, team building, organizing, communication, writing and presentation 1.2. Analytical, writing and presentation 1.3. Research, coordination, writing and presentation
2. Mechanical Systems	2.1. Mechanical system management policy and guidance are established 2.2. Mechanical Operation and Maintenance Team, roles and responsibilities, performance expectations and goals are established 2.3. Mechanical Operation and Maintenance processes and guides are adopted and agreed 2.4. Relevant information and provisions on Mechanical Operation and Maintenance related regulations and compliance requirements from DOE are obtained	2.1. Company policies, business processes and operating procedures; table of organization, roles, and responsibilities. 2.2. Mechanical System Standards and Guide 2.3. Philippine Mechanical Code (PMC) standards, etc.	2.1. Coordination, team building, organizing, communication, writing and presentation 2.2. Analytical, writing and presentation 2.3. Research, coordination, writing and presentation
3. Lighting Systems	3.1. Lighting system management policy and guidance are established 3.2. Lighting system Maintenance Team, roles and responsibilities,	3.1. Company policies, business processes and operating procedures;	3.1. Coordination, team building, organizing, communication, writing and presentation

	performance expectations and goals are established 3.3. Lighting system Maintenance processes and guides are adopted and agreed 3.4. Relevant information and provisions on Lighting system Maintenance related regulations and compliance requirements from DOE are obtained	table of organization, roles, and responsibilities. 3.2. Lighting System Standards and Guide 3.3. Philippine Electrical Code (PEC) standards, etc.	3.2. Analytical, writing and presentation 3.1. Research, coordination, writing and presentation

RANGE OF VARIABLES

VARIABLE	RANGE
2. 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
5. Appropriate personnel	Appropriate personnel may include: 2.13. Workplace personnel including supervisors and management 2.14. Site Engineers 2.15. Contractors 2.16. Operators and Maintenance personnel
6. Areas for energy saving (Energy Cost Centers)	Energy Cost Centers may include: a. Administration Building b. Production area c. Packaging Area d. HVAC Systems e. Power Generation
7. Workplace procedures	Workplace procedures for Energy Intensive Processes may include: 7.1. Inspection and housekeeping 7.2. Maintenance including plant and equipment

	7.3. Measurement and Monitoring System 7.4. Operational instruction on Phantom load detection 7.5. Energy Usage Peak and Off-Peak Hours

EVIDENCE GUIDE

8. Critical aspects of competency	Assessment requires that the candidate: 5.9. Accessed information concerning Energy management systems, Energy efficiency programs and policies 5.10. Implemented and monitored procedures concerning energy usage 5.11. Implemented and monitored energy management procedures following the PDCA cycle
9. Resource implications	The following resources should be provided: 6.19. Energy Management Systems procedural manual and trainings. 6.20. Energy Laws and Regulations on Energy Efficiency and Energy Conservation 6.21. Appropriate energy measuring equipment 6.22. Applicable PPE 6.23. Appropriate installation tools (i.e. pliers, screwdrivers, etc.) 6.24. Workplace or assessment area
10. Methods of assessment	Competency in this unit may be assessed through: Direct evaluation of energy management performance monitoring and control 9.6. Demonstration/Observation with oral questioning 9.7. Written test 9.8. Use of methods of measurements and verification for the implementation of energy efficiency and conservation projects
11. Context of assessment	11.1. Competency assessment must be undertaken in accordance with the endorsed assessment guidelines 9.9. Assessment may be conducted in the workplace.

SECTION 3. TRAINING ARRANGEMENTS

These standards are set to provide training providers with information and other important requirements to consider when designing training programs for Certified Energy Managers.

3.1 CURRICULUM DESIGN

DOE 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, Training 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 Management

Nominal Training Duration:

24 hrs. – Common Competencies
32 hrs. – Core Competencies
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56 hrs – Total training duration

Course Description:

This course is designed to provide the learner with knowledge, practical skills and attitude, applicable in performing work activities involve in implementing energy management, planning and supporting the implementation of regular energy audit, facilitating compliance to all relevant policies, and operating and maintaining energy-consuming machines and equipment in facilities.

Upon completion of the course, 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.

Training Plan – based on the Training Content Requirement approved by DOE, the ATI's are to submit their Training Plan to DOE for approval. Training Plans shall include the following:

1. Course description – describes the overall course objective and key areas/modules for training.

2. Module description – describes each key area under the course and module objective/s.

3. Under each module, a detailed description of the topics is presented:

Title of Topic	Topic description	Duration

4. Training Methods – a description of how knowledge areas shall be imparted.

5. Training schedule – a description of the duration for each module and the complete course.

6. Training requirements from participants – a description of participant screening, registration and connection to the seminar/webinar.

7. Speakers/Trainers profiles – a description of the qualifications of prospective speakers.

8. Assessment Method – a list of test items to be used for the certification passing.

Note: The above simple certification process is in part based on the Certified Management Consultant certification instituted by the Certified Management Consultants – Philippines, a local subsidiary of the Certified Management Consultants – United States.

COMMON COMPETENCIES

(24 hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Energy Management System (ISO 50001 OR Similar Framework) Basic Awareness	1.1. Understand Energy Management System (ISO 50001 or similar framework) Standards and Guides	1.1.1. Lecture/Discussion on: 1.1.1.1. Energy management system standards 1.1.1.2. Relevant provisions of energy management related regulations and issuances from DOE environmental legislation and codes of practice 1.1.1.3. Energy efficiency standards required in the workplace 1.1.1.4. Existing and potential areas for energy savings in the workplace 1.1.1.5. Energy consuming devices/ equipment 1.1.1.6. Relevant energy consumption baseline or standards 1.1.1.7. Existing energy efficiency and conservation measures 1.1.1.8. Organizational structure and site layout 1.1.1.9. PDCA cycle 1.1.1.10. Workplace procedures 1.2.1. Monitor operation performance	1.1.1. Lecture 1.1.2. Discussion 1.1.3. Field trip 1.1.4. Symposium 1.1.5. Video clips 1.1.6. Simulation/ Role playing	1.1.1. Written test 1.1.2. Demonstration & questioning 1.1.3. Observation & questioning	4 hours
2. Energy Audit (ISO 50002 or Similar Framework) Basic Awareness	2.1. Understanding Energy Audit (ISO50002 or similar framework) Requirements and Guide	2.1.1. Lecture and discussion on: 2.1.1.1. Capability building methods 2.1.1.2. Energy audit methodology, principles, process, guidelines, and procedures 2.1.1.3. Facilities production and operation processes and boundaries 2.1.1.4. Scope of an Energy Audit 2.1.1.5. Selection of Audit method based on recognized need 2.1.1.6. Make sample audit plan and schedule	2.1.1. Lecture 2.1.2. Discussion 2.1.3. Demonstration 2.1.4. Viewing multimedia 2.1.5. Hands on Practice	2.1.1. Practical demonstration 2.1.2. Oral questioning 2.1.3. Written exam 2.1.4. Presentation report	4 hours

		2.1.1.7. Data collection and measurement 2.1.1.8. Simple statistical tools and energy auditing techniques 2.1.1.9. Analysis of result 2.1.1.10. Estimates of manpower and budget required 2.1.1.11. Audit monitoring 2.1.1.12. Strategies for improving energy efficiency and energy use reduction 2.1.1.13. Opportunities for improvement of energy efficiency			
3. Industry Rules and Regulations Awareness	3.1. Understanding the EEC Law, its IRR and related DOE MC and DO	3.1.1. Lecture and discussion on: 3.1.1.1. RA 11285 EEC Law, IRR, related MCs and DOs from DOE, others 3.1.1.2. Company business processes and operating procedures; Above rules and regulations including penalties, rewards and incentives	3.1.1. Lecture 3.1.2. Discussion 3.1.3. Demonstration 3.1.4. Viewing multimedia	3.1.1. Written test 3.1.2. Demonstration & questioning 3.1.3. Observation & questioning	2 hours
	3.2. Understanding other related and complementary rules and regulation related to EEC	3.2.1. Lecture and discussion on: 3.2.1.1. Renewable Energy Act, Environmental Protection, ERC ruling, and others 3.2.1.2. Company business processes and operating procedures; Above rules and regulations including penalties, rewards and incentives	3.1.5. Lecture 3.1.6. Discussion 3.1.7. Demonstration 3.1.8. Viewing multimedia	3.1.4. Written test 3.1.5. Demonstration & questioning 3.1.6. Observation & questioning	2 hours
4. Operate and Maintain Tools and Equipment for Monitoring, Testing and	4.1 Plan and prepare for work to operate and maintain tools and equipment	4.1.1 Acquire sample work instruction 4.1.2 Interpret sample work instruction 4.1.3 Identify necessary and appropriate occupational health and safety requirements based on job specification 4.1.4 Identify relevant tools, equipment and hardware based on job specifications	4.1.1 Lecture 4.1.2 Discussion 4.1.3 Demonstration 4.1.4 Viewing multimedia 4.1.5 Hands on practice	4.1.1 Observation in workplace 4.1.2 Demonstration 4.1.3 Oral questioning	1 hour

Technical Audit	4.2 Prepare hardware, tools and equipment for operation and maintenance	4.2.1 Enumerate the personal protective equipment in preparing tools, hardware, and equipment as per job requirements 4.2.2 Procedures in acquiring tools, equipment and hardware 4.2.3 Perform functionality test of tools as per manufacturers standards	4.2.1 Lecture 4.2.2 Discussion 4.2.3 Demonstration 4.2.4 Viewing multimedia 4.2.5 Hands on practice	4.2.1 Observation in workplace 4.2.2 Demonstration 4.2.3 Oral questioning	1 hour
	4.3 Operate tools and equipment	4.3.1 Enumerate the personal protective equipment in operating tools, hardware and equipment as per job requirements 4.3.2 Discuss procedures in proper handling and application of tools and equipment based on job assignments 4.3.3 Discuss special features and function of identified tools and equipment	4.3.1 Lecture 4.3.2 Discussion 4.3.3 Demonstration 4.3.4 Viewing multimedia 4.3.5 Hands on practice	4.3.1 Observation in workplace 4.3.2 Demonstration 4.3.3 Oral questioning	2 hours
	4.4 Check condition of tools and equipment	4.4.1 Discuss and classify tools and equipment based on different usage and requirements 4.4.2 Study proper segregation of functional and non-functional tools and equipment 4.4.3 Analyze different safety procedures in handling tools and equipment as per manufacturer's instructions 4.4.4 Examine condition of Personal protective equipment and tools	4.4.1 Lecture 4.4.2 Discussion 4.4.3 Demonstration 4.4.4 Viewing multimedia 4.4.5 Hands on practice	4.4.1 Observation in workplace 4.4.2 Demonstration 4.4.3 Oral questioning	2 hours
	4.5 Perform basic preventive maintenance	4.5.1 Identify appropriate and different types of lubricants for different type and condition of equipment. 4.5.2 Review lubrication procedures in every preventive maintenance 4.5.3 Explain and perform testing and cleaning of tools and equipment 4.5.4 Practice inspection of working and non-working tools and equipment 4.5.5 Perform repair and replacement of components and parts for damage and non-working equipment	4.5.1 Lecture 4.5.2 Discussion 4.5.3 Demonstration 4.5.4 Viewing multimedia 4.5.5 Hands on practice	4.5.1 Observation in workplace 4.5.2 Demonstration 4.5.3 Oral questioning	4 hours

		4.5.6 Discuss good housekeeping after preventive maintenance procedure			
	4.6 Store tools and equipment	4.6.1 Discuss proper inventory and auditing of tools and equipment as per company procedure 4.6.2 Describe and determine different storage places for different tools and equipment 4.6.3 Identify conditions, weather and surroundings appropriate and not appropriate for storage of tools and equipment 4.6.4 Create checklist for inventory and auditing of tools and equipment	4.6.1 Lecture 4.6.2 Discussion 4.6.3 Demonstration 4.6.4 Viewing multimedia 4.6.5 Hands on practice	4.6.1 Observation in workplace 4.6.2 Demonstration 4.6.3 Oral questioning	2 hours

CORE COMPETENCIES
(32 hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Energy Management System Development and Implementation	1.1. Organizing for the Implementation of Energy Management System	1.1.1. Lecture and discussion on: 1.1.1.1. Company policies, business processes and operating procedures; table of organization, roles and responsibilities. 1.1.1.2. ISO 50001 Energy Management System Standards and Guide 1.1.1.3. Power industry and regulatory framework; DOE/ERC rules and regulations on EEC, etc	1.1.1 Lecture 1.1.2 Discussion 1.1.3 Demonstration 1.1.4 Viewing multimedia 1.1.5 Hands on practice	1.1.1 Written test 1.1.2 Demonstration & questioning 1.1.3 Observation & questioning	4 hours
	1.2 Energy Planning and Review	1.2.1 Lecture and discussion on: 1.2.1.1 Inventory of company's energy asset and resources, materials and equipment specifications, energy contract terms of reference and OEM manual of operation 1.2.1.2 Energy metering and instrumentation, installation and calibration, data retrieval and storage 1.2.1.3 Equipment specifications and usage, statistical tools and technique, data analytics 1.2.1.4 Equipment specifications and usage, technical audit methodology and industry benchmarks 1.2.1.5 ISO 50001 Energy Management System Standards and Guide,	1.2.2 Lecture 1.2.3 Discussion 1.2.4 Demonstration 1.2.5 Viewing multimedia 1.2.6 Hands on practice	1.2.1 Written test 1.2.2 Demonstration & questioning 1.2.3 Observation & questioning	4 hours

		Statistical tools and technique, Planning and Goal Setting 1.2.1.6 ISO 50001 Energy Management System Standards and Guide, Statistical tools and technique, Planning and Goal Setting, Budgeting guidelines			
	1.3 Energy Program Implementation, Operation, Monitoring and Continuous Improvement	1.3.1 Lecture and discussion on: 1.3.1.1 Company policies, business processes and operating procedures; Programs and project management 1.3.1.2 HR policies and guide 1.3.1.3 Company production process flowchart, process and equipment settings, supplychain, statistical process control and standards 1.3.1.4 Company procurement policies, technical and financial evaluation process, industry benchmark, vendor management 1.3.1.5 DOE/ERC rules and regulations on EEC annual reporting, ISO 50001 Energy Management System Standards and Guide, etc	1.3.1. Lecture 1.3.2. Discussion 1.3.3. Demonstration 1.3.4. Viewing multimedia 1.3.5. Hands on practice	1.3.6. Written test 1.3.7. Demonstration & questioning 1.3.8. Observation & questioning	4hours
2. Plan and Organize Energy Audit (Basic Energy Audit: Electrical, Mechanical, And Thermal)	3.1 Plan and schedule energy audit	3.1.1 Lecture and discussion on: - Capability building methods - Energy audit methodology, principles, process, guidelines and procedures - Facilities production and operation processes and boundaries - Scope of an Energy Audit - Selection of Audit method based on recognized need - Knowledge of resources requirement	2.1.1. Lecture 2.1.2. Discussion 2.1.3. Demonstration 2.1.4. Viewing multimedia 2.1.5. Hands on Practice	2.1.1 Practical demonstration 2.1.2 Oral questioning 2.1.3 Written exam 2.1.4 Presentation report	2 hours

		3.1.2 Make sample audit plan and schedule			
	3.2 Implement energy audit	3.2.1 Lecture and discussion on: - Energy audit methodology, principles, process, guidelines and procedures - Facilities production and operation processes and boundaries - Energy equipment devices specifications - Setting of Energy Target and Plan - Analysis of result - Estimates of manpower and budget required - External auditors' proper credentials and track record. 3.2.2 Presentation of sample analysis of audit result	2.2.1. Lecture 2.2.2. Discussion 2.2.3. Demonstration 2.2.4. Viewing multimedia 2.2.5. Hands on Practice	2.2.1. Practical demonstration 2.2.2. Oral questioning 2.2.3. Written exam 2.2.4. Presentation report	4 hours
	3.3 Develop and recommend strategies for improving energy efficiency	3.3.1 Lecture and discussion on: - Energy audit methodology, principles, process, guidelines and procedures - Facilities production and operation processes and boundaries - Energy equipment devices specifications - target energy reduction check audit recommendations - Assessment on identified opportunities for improvement	2.3.1. Lecture 2.3.2. Discussion 2.3.3. Demonstration 2.3.4. Viewing multimedia 2.3.5. Hands on Practice	2.3.1. Practical demonstration 2.3.2. Oral questioning 2.3.3. Written exam 2.3.4. Presentation report	2 hours
3. **Technical Competencies**	3.1. Electrical Systems	3.1.1 Lecture and discussion on:	6.1.1 Lecture 6.1.2 Discussion	3.1.1 Written test	4 hours

		3.1.1.1 Company policies, business processes and operating procedures; table of organization, roles and responsibilities. 3.1.1.2 Electrical System Standards and Guide 3.1.1.3 Philippine Electrical Code (PEC) standards, etc.	6.1.3 Demonstration 6.1.4 Viewing multimedia	3.1.2 Demonstration & questioning 3.1.3 Observation & questioning	
	3.2. Mechanical Systems	3.2.1 Lecture and discussion on: 3.2.1.1 Company policies, business processes and operating procedures; table of organization, roles and responsibilities. 3.2.1.2 Mechanical System Standards and Guide 3.2.1.3 Philippine Mechanical Code (PMC) standards, etc.	3.2.1 Lecture 3.2.2 Discussion 3.2.3 Demonstration 3.2.4 Viewing multimedia	3.2.1 Written test 3.2.2 Demonstration & questioning 3.2.3 Observation & questioning	4 hours
	3.3 Lighting Systems	3.3.1 Lecture and discussion on: 3.3.1.1 Company policies, business processes and operating procedures; table of organization, roles and responsibilities. 3.3.1.2 Lighting System Standards and Guide 3.3.1.3 Philippine Electrical Code (PEC) standards, etc.	3.2.1 Lecture 3.2.2 Discussion 3.2.3 Demonstration 3.2.4 Viewing multimedia	3.2.1 Written test 3.2.2 Demonstration & questioning 3.2.3 Observation & questioning	4 hours

3.2 TRAINING DELIVERY

1. The delivery of training shall adhere to the design of the curriculum. Delivery shall be guided by the principles of competency-based training.

    a. Course design is based on competency standards set by the industry or recognized industry sector; (Learning system is driven by competencies written to industry standards);
    b. Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;
    c. Training can be done on an actual workplace setting, simulation of a workplace and/or through adoption of modern technology;
    d. Assessment is based in the collection of evidence of the performance of work to the industry required standards;
    e. Assessment of competency takes the trainee's knowledge and attitude into account but requires evidence of actual performance of the competency as the primary source of evidence;
    f. Training program allows for recognition of prior learning (RPL) or current competencies;
    g. Training completion is based on satisfactory completion of all specified competencies not on the specified nominal duration of learning.

2. The competency-based training system recognizes various types of delivery modes, both on-and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities and their variations/components may be adopted singly or in combination with other modalities when designing and delivering training programs:

    2.1 Institution- Based:

    - Dual Training System (DTS)/Dualized Training Program (DTP) which contain both in-school and in-industry training or fieldwork components. Details can be referred to the Implementing Rules and Regulations of the DTS Law on the DTP;

    - Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, audio, video, computer technologies or other modern technologies that can be used to facilitate learning and formal and non-formal training. Specific guidelines on this mode shall be issued by the ATI's Secretariat.

    - Supervised Industry Learning (SIL) or on-the-job training (OJT) is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies as prescribed in the training regulations. It is imperative that the deployment of trainees in the workplace is adhered to training programs agreed by the institution and enterprise and status and progress of trainees are closely monitored by the training institutions to prevent opportunity for work exploitation.

    - The classroom-based or in-center instruction uses of learner-centered methods as well as laboratory or field-work components.

2.2 **Enterprise-Based:**

- Formal Apprenticeship is training within employment involving a contract between an apprentice and an enterprise on an approved apprenticeable occupation.

- Informal Apprenticeship is based on a training (and working) agreement between an apprentice and a master craftsperson wherein the agreement may be written or oral and the master craftsperson commits to training the apprentice in all the skills relevant to his or her trade over a significant period of time, usually between one and four years, while the apprentice commits to contributing productively to the work of the business. Training is integrated into the production process and apprentices learn by working alongside the experienced craftsperson.

- Enterprise-based Training where training is implemented within the company in accordance with the requirements of the specific company. Specific guidelines on this mode shall be issued by the ATI's Secretariat.

2.3 **Community-Based:**

- Community-Based Training is short term programs conducted by non-government organizations (NGOs), LGUs, training centers and other training providers which are intended to address the specific needs of a community. Such programs can be conducted in informal settings such as barangay hall, basketball courts, etc. These programs can also be mobile training program (MTP).

3.3 TRAINEE ENTRY REQUIREMENTS

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

- Must be a licensed engineer or a graduate of 4-year course with at least 3 years continuous hands-on experience in the installation, maintenance and operation of energy consuming machines in facilities with Type 2 Designated Establishments
- The certification of experience duration and field is proposed to be given by the respective organizations where the trainees belong. For independent professionals, certification may be issued from clients or organizations where the required activities were conducted.
- Able to communicate both oral and/or written

This list does not include specific institutional requirements, such as height and age requirements, educational attainment, appropriate work experience and others that may be required from the trainees by the school or training center delivering the training program.

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS

Recommended list of tools, equipment, and materials for the training of **25 trainees** for Energy Management:

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.

TOOLS		EQUIPMENT		MATERIALS	
QTY	**ITEM**	**QTY**	**ITEM**	**QTY**	**ITEM**
5 sets	Screwdrivers, all types	1	Flue Gas Analyzers	5 reams	Bond Paper
5 sets	Pliers, varied sizes	1	Lux Meters	2 pcs	Eraser, White board
5 sets	Adjustable wrenches, varied sizes	1	pH meter	1 set	Board markers, assorted colors
		1	Thermal Insulation Scanner/ Thermal Imaging Camera	1 set per pax	Training Manuals/ Documents / Reference materials
		1	Temperature and Humidity Tester		
		1	Analog/digital Multimeter		
		1	Handheld/Thermo-hygrometer		
		1	Power quality analyzer		
		1	Ultrasonic Leak Detector (optional)		
		1	Conductivity/Insulation Multimeter		
		1	Distance Laser Meter		
		1	Handheld Ultrasonic Flow meter		
			IT SYSTEM		
		1	PC/Laptop		
		1	Sound system		
		1	LCD /multimedia projector / TV monnitor		
		1	White board		
			PPE		
		5 pcs	Safety Helmet		
		5 sets	Gloves, rubber/leather/cloth		
		5 pairs	Safety Goggles		
		5 pairs	Safety shoes		
		5 sets	Safety harness (optional)		

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 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
A. LECTURE AREA / WORKSHOP AREA*	6 x 10	60	1	60
B. LEARNING RESOURCE AREA	3 x 4	12	1	12
C. TOOL/STORAGE /CABINET AREA*	2 x 2	4	1	4
D. WASHROOM & TOILET *	2 x 3	6	1	6
TOTAL				82
F. 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

3.6 TRAINERS QUALIFICATIONS ON ENERGY MANAGEMENT

- Must be a holder of National Energy Management Trainer Certificate or a PRC licensed Energy Manager or Energy Auditor duly certified by the DOE;
- Must have a PRC license related to energy, power and associated technologies;
- Must have at least 2 years relevant industry experience within the last 5 years;
- Must be computer literate

3.7 INSTITUTIONAL ASSESSMENT

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

SECTION 4: ASSESSMENT AND CERTIFICATION ARRANGEMENTS

Competency Assessment is the process of collecting evidence and making judgments whether competency has been achieved. The purpose of assessment is to confirm that an individual can perform to the standards expected at the workplace as expressed in relevant competency standards.

The assessment process is based on evidence or information gathered to prove achievement of competencies. The process may be applied to an employable unit(s) of competency in partial fulfillment of the requirements of the national qualification.

4.1 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1.1. To attain the National Qualification of **Energy Management**, the candidate must demonstrate competency in all the units listed in Section 1. Successful candidates shall be awarded an **Energy Management Certificate** signed by the DOE Secretary.

4.1.2. The qualification **Energy Management** can be attained through demonstration of competence through project-type assessment covering all the units required.

4.1.3. Assessment shall cover all competencies, with basic and common integrated or assessed concurrently with the core units of competency.

4.1.4. Any of the following are qualified to apply for assessment and certification:

1.2.4.1 Graduate of formal training in energy, power and associated technologies or related training;

1.2.4.2 Worker with at least 3 years continuous hands-on experience in the installation, maintenance, and operation of energy consuming machines in facilities with Type 2 Designated Establishments

4.1.5. **Recognition of Prior Learning (RPL).** Candidates who have gained competencies through previous work or life experiences, education, and informal training related to all the core competencies may apply for recognition in the qualification through Portfolio Assessment to DOE.

4.2 COMPETENCY ASSESSMENT REQUISITE

4.2.1 Self-Assessment Guide. The self-assessment guide (SAG) is accomplished by the candidate prior to actual competency assessment. SAG is a pre-assessment tool to help the candidate and the assessor determine what evidence is available, where gaps exist, including readiness for assessment.

This document can:

a. Identify the candidate's skills and knowledge
b. Highlight gaps in candidate's skills and knowledge
c. Provide critical guidance to the assessor and candidate on the evidence that need to be presented
d. Assist the candidate to identify key areas in which practice is needed or additional information or skills that should be gained prior `

4.2.2 Accredited Assessment Center. Only assessment center accredited by DOE is authorized to manage the assessment activities of candidates for certification.

4.2.3 *Accredited Competency Assessor*. Only competency assessor accredited by DOE is authorized to assess the competencies of candidates for certification or, he can also be a PRC licensed Energy Manager or Energy Auditor duly certified by the DOE.

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) **Elective Competencies -** are the additional skills and knowledge required by the individual or enterprise for work

11) **Elements** - are the building blocks of a unit of competency. They describe in outcome terms the functions that a person performs in the workplace.

12) **Evidence Guide** - is a component of the unit of competency that defines or identifies the evidences 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

13) **Level -** refers to the category of skills and knowledge required to do a job

14) **Method of Assessment** - refers to the ways of collecting evidence and when, evidence should be collected

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

19) **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

18) **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

19) **Basic Competencies -** are the skills and knowledge that everyone needs for work

20) **Training Regulations (TR)** – refers to the document promulgated and issued by DOE consisting of competency standards, national qualifications and training guidelines for specific sectors/occupations. The TR serves as basis for establishment of qualification and certification under the PTQF. It also serves as guide for development of competency-based curricula and instructional materials including registration of Training programs offered by Training providers

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

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** - 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** – documents 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;

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 of time following regulatory requirements and/or business plans;
26. **Full Body Harness** - 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;
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 -** 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 tonne-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.

REFERENCES:

- Republic Act 11285, Energy Efficiency and Conservation Act (EECA)
- Republic Act. No. 9136 or EPIRA
- EPIRA IRR
- Administrative Order No. 110 – Directing the Institutionalization of a Government Energy Management Program (GEMP) (from OP)
- DOE DC No. 2019-11-0014 Implementing Rules and Regulations of RA 11285, EEC-IRR
- DOE DC2014-08-0014 – Enjoining all Electricity-Consuming Sectors to Implement Demand-Side Management Program and other Conservation Measures
- DOE MC2020-05-0001 – Compliance of Designated Establishments
- DOE DC2020-09-0018 – ESCO Guidelines
- DOE DC2020-12-0026 – Guidelines on Energy Conserving Design on Buildings
- ASHRAE Standards for Ventilation System Design and Acceptable Indoor Air Quality (IAQ)
- Philippine Green Building Code
- Philippine Electrical Code
- Philippine Mechanical Code
- ISO 50001 (2018) Energy Management System (EnMS) - Requirements with Guidance for Use
- ISO 50002 (2014) Energy Audits - Requirements with Guidance for Use
- ISO 14000 Environmental Management Standards
- ISO 18000 Occupational Health and Safety Standards