



**Alternative Energy Promotion Centre (AEPC)
National Rural and Renewable Energy Programme (NRREP)**

**Integrated Quality Assurance and Monitoring Guideline for Implementation of the
AEPC/NRREP Supported Rural Energy Technologies**

FINAL REPORT

Submitted by:

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Acronyms and Abbreviations

AEPC	Alternative Energy Promotion Centre
BESC	Biomass Energy Sub-Component
BGSC	Biogas Energy Sub-Component
CESC	Community Electrification Sub-Component
DANIA	Danish International Development Agency
DfID	Department for International Development of UK Government
DFS	Detail Feasibility Study
EU	European Union
GoN	Government of Nepal
HH-MICS	Household Metallic Improved Cooking Stove
ICS	Improved Cook Stove
IMICS	Institutional Metallic Improved Cooking Stove
IWM	Improved Water Mill
IWME	Improved Water Mill for Electrification
KfW	German Development Bank
NRREP	National Rural and Renewable Energy Programme
MGS	Metallic Gasifier System
MHP	Micro-hydro Project
MoSTE	Ministry of Science, Technology and Environment
MQA	Monitoring and Quality Assurance
MRS	Metallic Rocket Stove
PHP	Pico-hydro Project
QA	Quality Assurance
QC	Quality Control
REF	Renewable Energy Fund
RETs	Rural/renewable energy technologies
SESC	Solar Energy Sub-Component
SPVS	Solar Photovoltaic System
STS	Solar Thermal System
SNV	Netherlands International Development Organisation
TSP	Technical Service Provider
UNDP	United Nations Development Programme

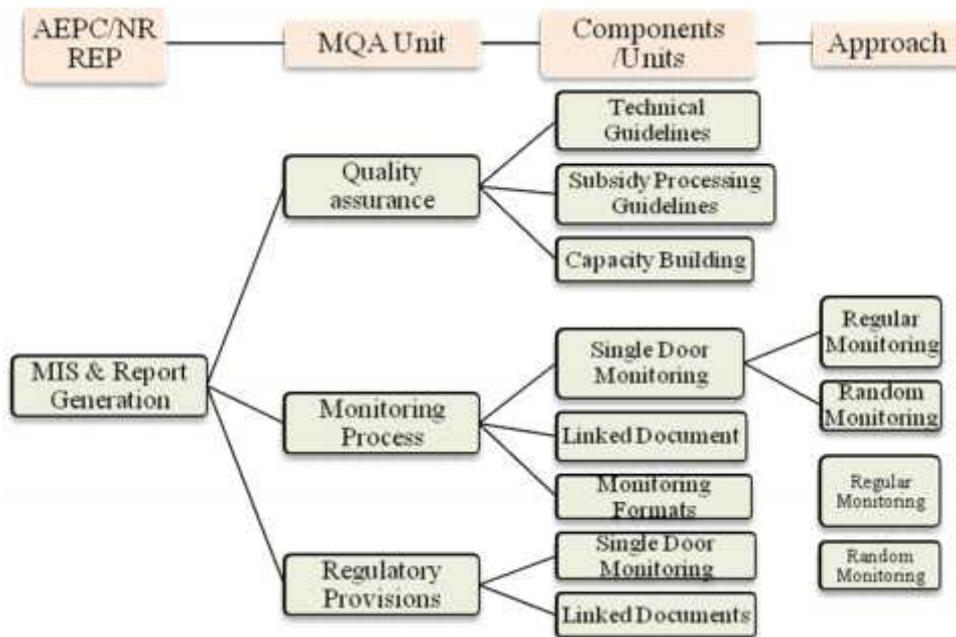
Executive Summary

Alternative Energy Promotion Centre/National Rural and Renewable Energy Programme (AEPC/NRREP) is a single programme modality in the renewable energy sector in Nepal supported by multi-donors. The programme has multiple components and the monitoring and quality assurance processes have been handled by respective components which have raised concerns of lack of coordination and limited institutional learning. Therefore, AEPC/NRREP has taken a step forward to integrated monitoring and quality assurance through establishment of a responsible coordinating Unit called Monitoring & Quality Assurance (MQA) unit as well as streamlining the guidelines, standards, procedures and practices into a coordinated whole entity. Through such effort the emerging concerns are expected to be resolved.

The methodology involved the followings:

- i) Collection and review of existing documents on policies and procedures;
- ii) Collection and compilation of pertinent information implementation modalities, delivery mechanisms, and monitoring & quality assurance mechanisms of all the AEPC/NRREP-supported RE technologies;
- iii) Design an integrated framework to interconnect all policies and guidelines as a single platform including necessary additions and clarifications;
- iv) Convert the output of step iii) into HTML files with a conceptual design of search and navigation along with actual files that are to be utilized;
- v) Compile a final document both digital and hard copies (It is to be noted that the individual policies and documents will be only in soft copies); and
- vi) Submission the final outputs

Conceptually the new integrated framework for monitoring and quality assurance can be presented as in the following diagram:



In the integrated or new framework (above), conceptually at the AEPC/NRREP level it will be useful to have a MIS which could facilitate report generation at times of need in a more convenient and proficient manner. The role of MQA Unit becomes more prominent in terms of quality assurance, ensuring proper monitoring process and making AEPC as a whole more resilient on regulatory provisions. The components or Technical Units are the key owners and users of necessary guidelines and building capacity at different levels, but in a more integrated fashion whereby everything will be available in one window for all users at different levels as per their need. In terms of monitoring approach it can be regular monitoring and/or random monitoring for which essential formats, policies and guidelines are available at ‘one stop-shop’.

The renewable energy technologies the AEPC/NRREP have been organised into relevant maps for ease and clarity in reading. Key documents concerning quality assurance, monitoring processes and regulatory provisions are summarised where possible as well as presented as linked documents.

The technical specifications or quality standards (or quality) are the key factors which have direct bearing on the type, intensity (frequency& rigor)and process of monitoring activities, and the strictness of regulatory provisions. The user of this document can directly go to the required quality assurance or monitoring or regulatory provisions for respective RETs through the hyperlinks specified under each of them.

On the regulatory part, however, it heavily draws on the RE Subsidy Delivery Mechanism (2013) and, therefore, one may find clear picture from this document itself.

The Chapter 5 of this document is the key component of this report which is more like a Wikipedia in its format. It has tried to pull together maximum number of document related to

quality assurance, monitoring process and regulatory provision. There is a future scope of making the provisions more streamlined as well as adding some provisions.

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1. Introduction

Alternative Energy Promotion Centre (AEPC), under the Ministry of Science, Technology and Environment (MoEST), is the national apex body for renewable and rural energy development in Nepal. It is the national executing agency of the Government of Nepal (GoN) for renewable and rural energy programmes and projects having mandates for formulation of policy and plans, technology innovation, resource mobilization and coordination and quality assurance. AEPC has been implementing National Rural and Renewable Energy Programme (AEPC/NRREP, 2012-2017) as a single programme modality with the support from various development partners including Danida, DfID, EU, KfW, Norway, SNV, UNDP, World Bank and others.

AEPC's approach to promotion of various rural/renewable energy technologies (RETs) has been through financial (subsidy) and technical supports. The key RETs include: solar energy systems (solar home systems, small solar home systems, solar PV water pumping systems, institutional solar PV systems, solar dryers, solar cookers), pico/micro/mini-hydro, improved water mill, mud/metallic improved cook stoves, biomass gasifier, domestic/community/institutional biogas plants etc. The support modality of the AEPC/NRREP is through thematic sub-components (i.e., Solar Energy, Community Electrification, Biogas and Biomass Energy) which make them responsible for implementation of the concerned RE technologies as well as monitoring them for quality assurance. Accordingly, various guidelines (including required Forms/Formats) and technical standards have been developed and issued separately.

However, the emerging concern for AEPC/NRREP is that the monitoring approach followed by the sub-components are not uniform, and lacking coordination among them during planning of M&E activities as well as during field mobilization of monitoring personnel or consultants. The resultant situation is such that operational cost has become extravagant, and perhaps more seriously it is negatively impacting on organizational learning. Therefore, AEPC/NRREP has made an attempt to curb the problem through integrated approach of monitoring under the leadership of Monitoring and Quality Assurance (MQA) Unit from the fiscal year 2014/15 onwards. Hence, this guideline is prepared by Go Green Consultancy Pvt. Ltd. based on consultations as well as a thorough review of existing policies, guidelines, technical standards, and tools.

2. Objective of the assignment

The overall objective of the assignment is *“to prepare an integrated and systematized documentation of ‘Monitoring and Quality Assurance Guideline’ of NRREP so that all obligatory organizational policies, technical standards, strategies, regulations, tools, process etc. related to monitoring are clear and easily obtainable for the use in digital format integrated with AEPC website.”*

Along with the overall objective, the scope of work and deliverables are presented in matrix form in Annex 1.

3. Methodology

3.1 The Steps

Further to the Terms of Reference (ToR) and initial discussion with the officials of MQA Unit, the inception report elaborated the methodological aspects. The steps taken for preparation of this report are presented in the following Figure 1.

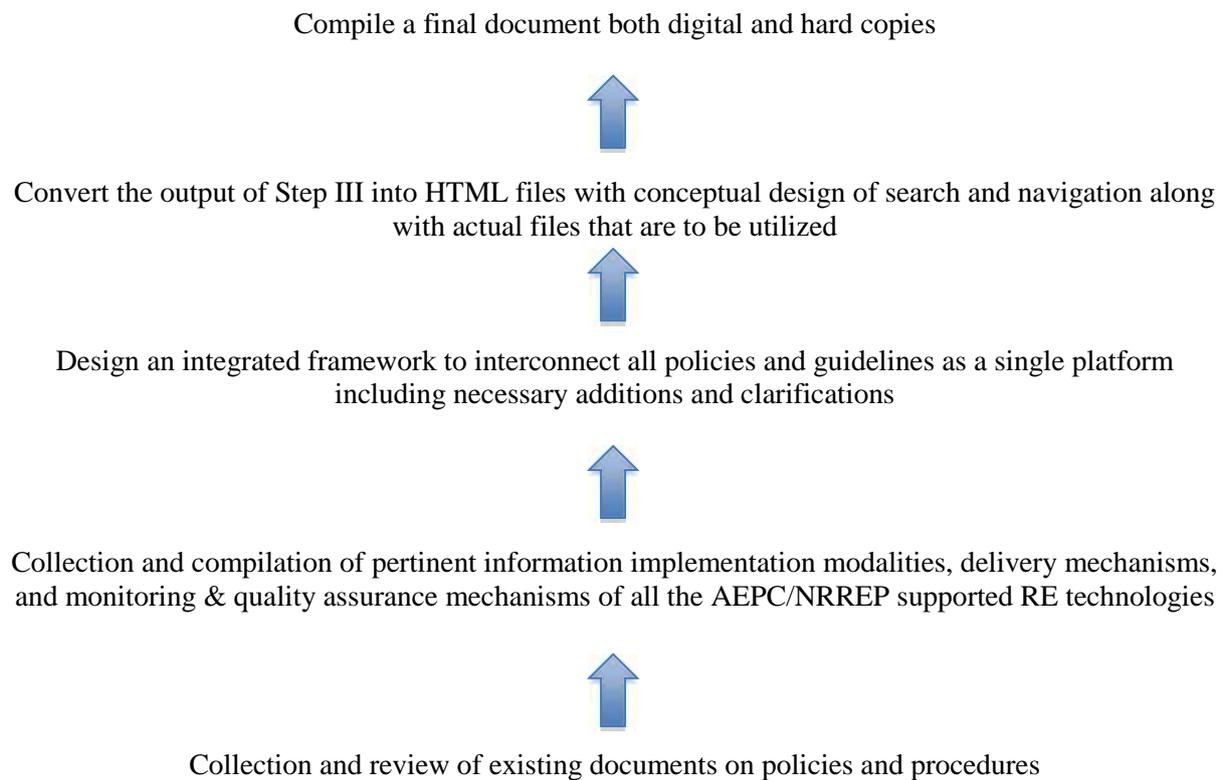


Figure 1: Methodological steps

3.2 Conceptual frameworks

Based on the collected policy, institutional and procedural documents conceptual frameworks were developed as bases for designing the integrated monitoring and quality assurance framework.

The following Figure 2 explains the monitoring frameworks being practised in AEPC from the institutional or structural point of view.

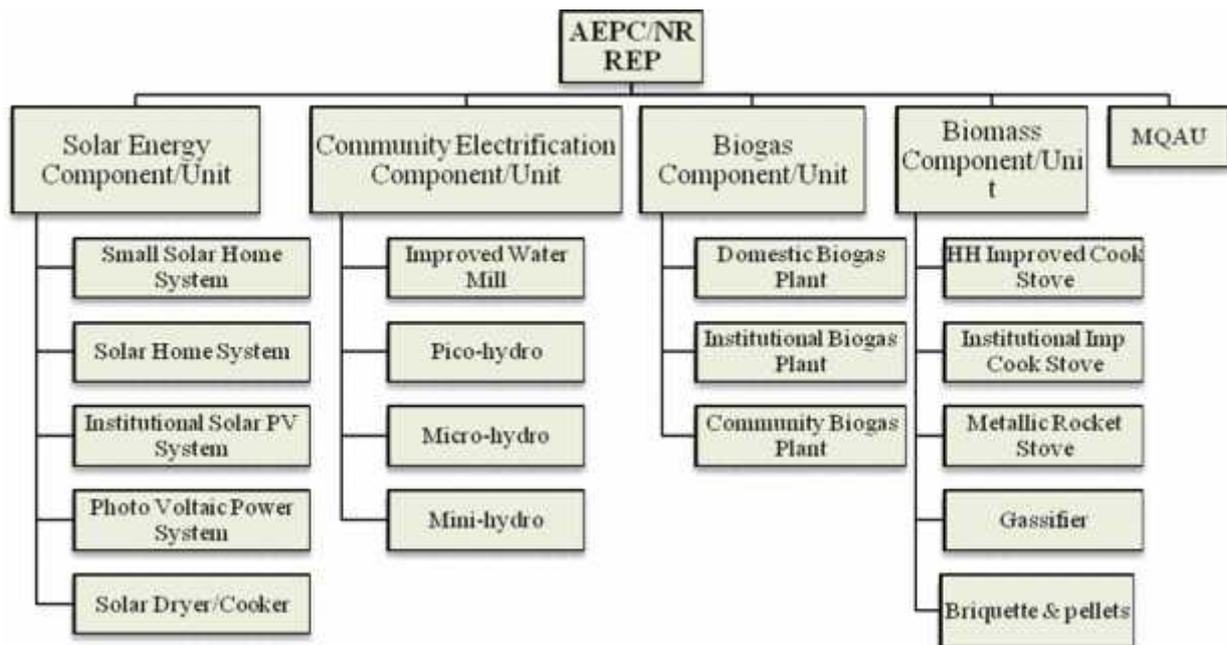


Figure 2: Monitoring and quality assurance practice of AEPC/NRREP.

The present practice of monitoring and quality assurance (as above) suggests that individual sub-components undertake implementation as well as monitoring responsibilities and lack horizontal coordination as well as collaboration. Such situation is bound to be costly in one hand and constraining to institutional learning on the other.

Therefore, there should be a more integrated monitoring and quality assurance framework as presented in the following Figure 3.



Figure 3: Integrated monitoring and quality assurance framework

In the integrated or new framework, conceptually at the AEPC/NRREP level it will be useful to have a MIS which could facilitate report generation at times of need in a more convenient and proficient manner. The role of MQA Unit becomes more prominent in terms of quality assurance, ensuring proper monitoring process and making AEPC as a whole more resilient on regulatory provisions. The components or Technical Units are the key owners and users of necessary guidelines and building capacity at different levels, but in a more integrated fashion whereby everything will be available in one window for all users at different levels as per their need. In terms of monitoring approach it can be regular monitoring and/or random monitoring for which essential formats, policies and guidelines are available at ‘one stop-shop’.

Based on the new conceptual structure for monitoring and quality assurance, the detail findings and propositions on how the different documents relate to monitoring, supervision and quality assurance will be discussed in the next chapter.

4. Limitation of the study

This report tries to weave through all the policy, regulatory, monitoring and quality assurance documents issued by AEPC as far as available. Except for regulatory provisions, this study has tried not reproduce texts in this report. Therefore, the report is very much abstract and advises to access details through hyperlinks (all yellow highlighted parts are individual location where hyperlinks are to be generated).

5. Integrated monitoring and quality assurance framework report

Delivery of RETs and energy services at the grassroots level are very much dependent on proper or systematic monitoring and quality assurance. In the integrated framework, a deeper analysis reveals that quality assurance, monitoring process and regulatory provisions are inherently interlinked and complement each other. A schematic representation of these three elements is presented in Figure 4 below.

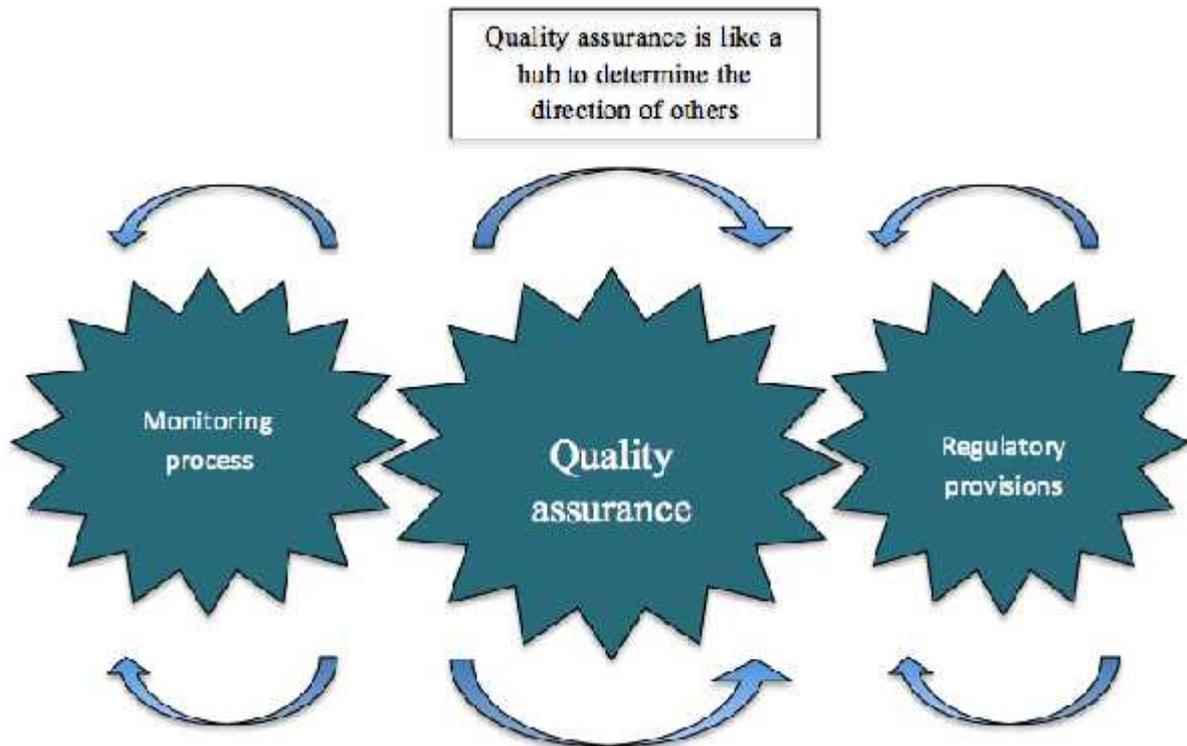


Figure 4: Interrelationship of quality assurance, monitoring and regulatory provisions

Figure 4 shows mechanically if 'quality assurance' wheel with sprockets rotate clockwise (or anti-clockwise), then the wheels of 'monitoring process' and 'regulatory provisions' will rotate in the direction as shown. This means quality assurance is at the centre of the new integrated framework which has tremendous influence in the monitoring as well as regulatory provisions. In other words, the technical specifications or quality standards (or quality) are the key factors which have direct bearing on the type, intensity (frequency & rigor) and process of monitoring activities, and the strictness of regulatory provisions.

Based on the existing documents and mechanisms, these three elements (quality assurance, monitoring process, and regulatory provisions) have been discussed in the following paragraphs to integrate them into an overall or integrated platform of guidelines. There are several documents, and descriptions below will primarily link them into this one report without reproducing the contents of those scattered documents. The user of this document

can directly go to the required quality assurance or monitoring or regulatory provisions for respective RETs through the hyperlinks specified under each of them.

5.1 Quality assurance

In a very simple and practical term, quality assurance (QA) means ensuring the delivery of pre-defined quality of a goods or product or service. It is also quite interchangeably referred as quality control (QC) also to connote the process aspects of quality assurance.

For RETs, as goods or products, quality specifications or standards have been well defined in various documents issued by AEPC corresponding to the various technologies as sub-components of AEPC/NRREP. One of the key aspects of quality assurance is “**Criteria to be fulfilled for Subsidy**” for all RETs covered under **RE Subsidy Delivery Mechanism (2013)**.

Respective technologies or sub-components and specific documents referring to quality assurance will be described in the following paragraphs. The details will be linked through hyperlinks.

5.1.1 Solar Energy Sub-Component

This sub-component consists of i) Solar Thermal System (STS), and ii) Solar Photovoltaic System (SPVS) and their respective technological applications are as presented in the following Figure 5.

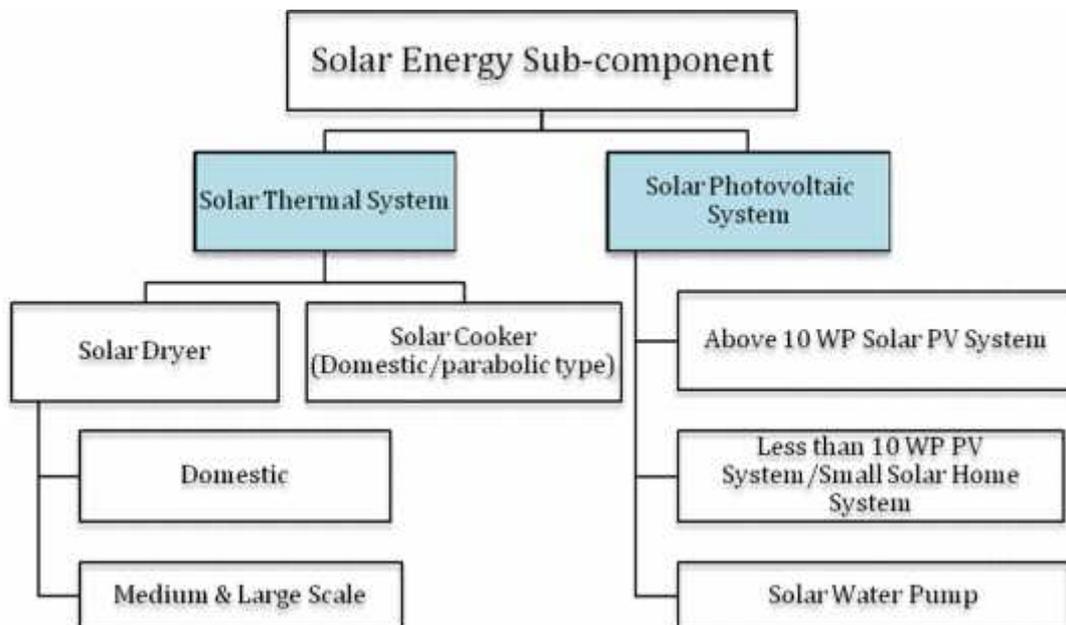


Figure 5: Solar Energy Sub-component diagram

5.1.1.1 Solar Thermal System:

The **Technical Standards for Solar Dryers and Cookers (2013)** of AEPC, prescribes the minimum technical standards for different technologies as outlined in the Figure 6:

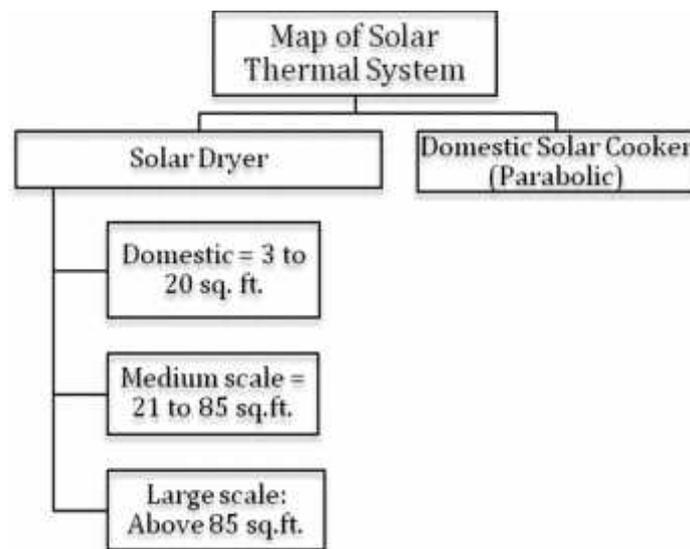


Figure 6: Solar Thermal System Technologies

This is a short 12-pages document includes technical specifications for dryers and cookers comprising of following areas of information:

Domestic Solar Dryer: Chamber, Installation, Paint, Aperture, Label, Warranty Card and Warranty.

Medium and Large scale Solar Dryer: Chamber, Installation, Absorber, Paint, Aperture, Forced convection, Label, Warranty Card and Warranty.

Parabolic disc: Reflecting disc (diameter, material, reflectivity and concentration ratio), Dish supporting frame, Dish stand, Tracking system and other requirements.

5.1.1.2 Solar Photovoltaic system:

Nepal Photovoltaic Quality Standard (2013) specifies technical standards of solar PV systems and system component in two categories – i) PV systems up to 10 Wp capacity, and ii) PV systems above 10 Wp capacity.

For the “Above 10 WP” systems, specifications of standards are described as per the following Figure 7.

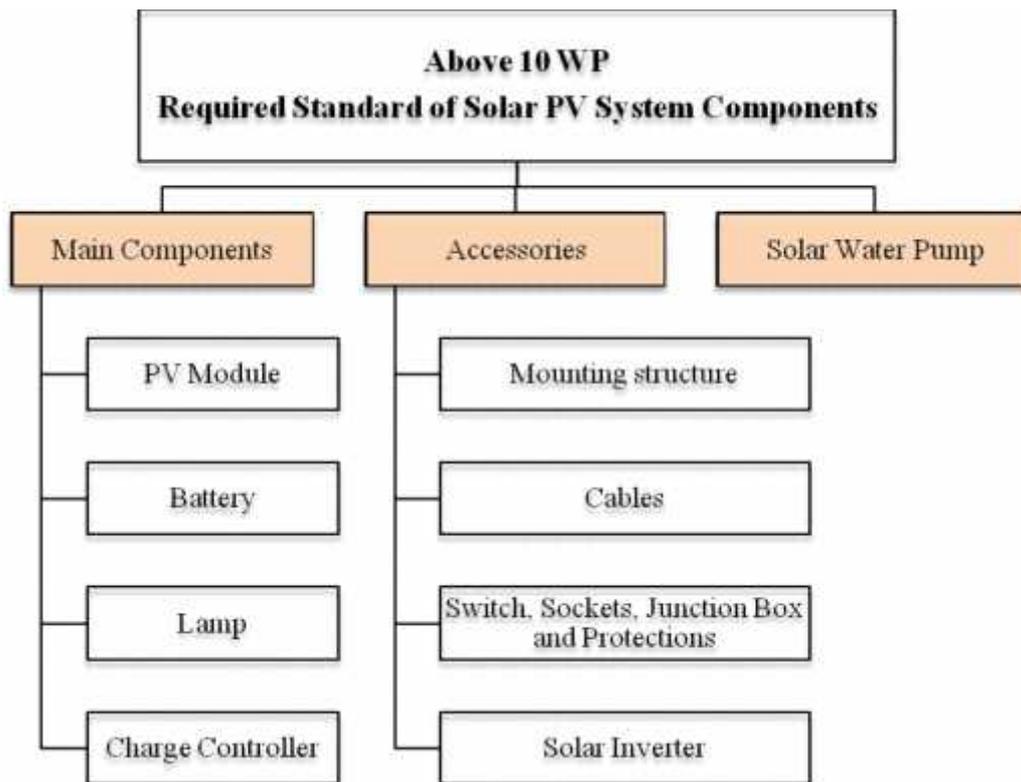


Figure 7: Schematic diagram of Above 10 WP Solar PV System Components

For detail description of standards click [PV Module](#), [Battery](#), [Lamp](#), [Charge Controller](#), [Mounting Structure](#), [Cables](#), [Switch, Sockets, Junction Box & Protections](#), and [Inverter](#).

Similarly, read (click) [Solar Water Pump](#) for detail descriptions.

For the “Less than 10 WP” systems, specifications of standards are described as per the following Figure 8.

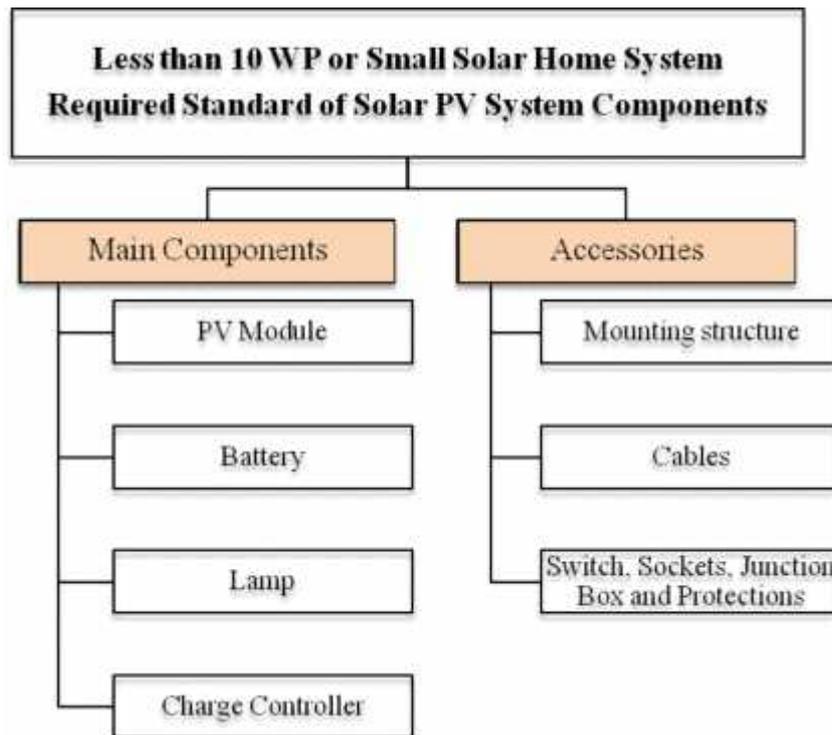


Figure 8: Schematic diagram of Less than 10 WP Solar PV System Components

For detail description of standards click [PV Module](#), [Battery](#), [Lamp](#), [Charge Controller](#), [Mounting Structure](#), [Cables](#), [Switch, Sockets, Junction Box & Protections](#), and [Inverter](#).

5.1.2 Community electrification

Hydro-based electrification schemes consisting of pico-hydro, micro-hydro and minihydro technologies fall under the responsibility of Community Electrification Sub-component of AEPC/NRREP as presented in following block diagram (Figure 9).

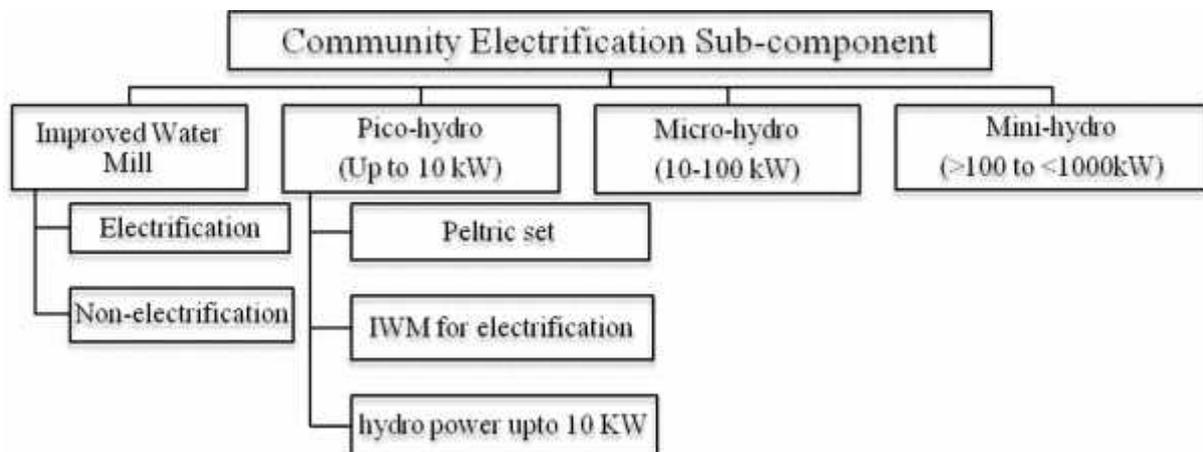


Figure 9: Schematic diagram of community electrification technologies.

It is to be noted that electrification in communities also happens through solar photovoltaic systems which have been already dealt in the previous paragraph (see Para 5.1.1.2).

Improved Water Mill (IWM):

As presented in Figure 9 above, IWM can be for electrification and non-electrification or mechanical. **Surveyor or Local Partner Institution reference form**, **Subsidy Application Form**, **Implementation Guidelines** and **Owners Manual** are the key documents for quality assurance primarily for non-electrification. For electrification, it is covered under pico-hydro category.

Pico-hydro (upto 10 kW): As shown in Figure 9 above, pico-hydro comprises of hydropower projects up to 10 kW capacity including peltriset and IWM for electrification. There are 2 key documents for pico-hydro as i) **Pico-hydro Design Guideline** and ii) **Pico-hydro Implementation Guidelines**. These documents have a number of annexes and forms as well as do make reference of a number of annexes to other guidelines. With reference to page number 15 of **Pico-hydro Design Guideline** there are annexes as follows:

- i) **Annex 1** for Pre-feasibility study,
- ii) **Annex 3.1** for DFS upto 3 kW Peltric Sets
- iii) **Annex 3.2** for DFS upto 5 kW IWM for Electrification and Peltric Sets
- iv) **Annex 3.3** for Other pico-hydro DFS, and
- v) **Annex 6** describes “Technical Requirement for Pico-hydro Projects and Micro-hydro Projects”

Basically, for quality assurance the technical specifications or requirements made in the DFS reports are the standards to be maintained.

Processes are also very important for quality assurance in line with **Pico-hydro Implementation Guidelines** which includes 3 annexes and 15 different forms (**Click here for more reading**) suggesting their needs at different stages of implementation. For instance, **Project Request Form**, **Project Appraisal Form**, **Construction Supervision Form**, **Power Output Verification Form**, and **Guaranty Arrangements** are crucial for officials concerned in assuring quality as per approved technical standards while approving the DFS.

Micro-hydro (10 – 100 kW):The design prescriptions of DFS are the technical standards or quality of micro-hydro projects (MHPs). For ensuring the quality of a MHP there are a number of forms and formats to be followed during implementation. (Click links for more readings). The DFS format, Subsidy application form, Supervision format, Household Connection Verification Form, Quality monitoring format, Guaranty arrangements and Quality Confirmation sheet are key documents for quality assurance. Since there can be a number of MHPs that need rehabilitation, the Guidelines for Rehabilitation of MHPs should be referred.

Mini-hydro (>100 to 1000 kW): AEPC has developed Guidelines for Detailed Feasibility Studies of Mini Hydropower Projects (2014) and Micro/Mini-Hydropower Survey and Design Tools (2014) with the objective of providing sound basis for consultants to undertake DFS and designing of the mini-hydro power projects to be constructed under AEPC/NRREP purview¹. Again, it is important to note that quality assurance is directly related to the recommendations made in the DFS on all technical parameters and standards.

5.1.4 Biogas

Consistent to the RE Subsidy Delivery Mechanism (2013), the Biogas Energy Sub-component of AEPC/NRREP promotes following types of biogas plants as presented in the Figure 10 below.

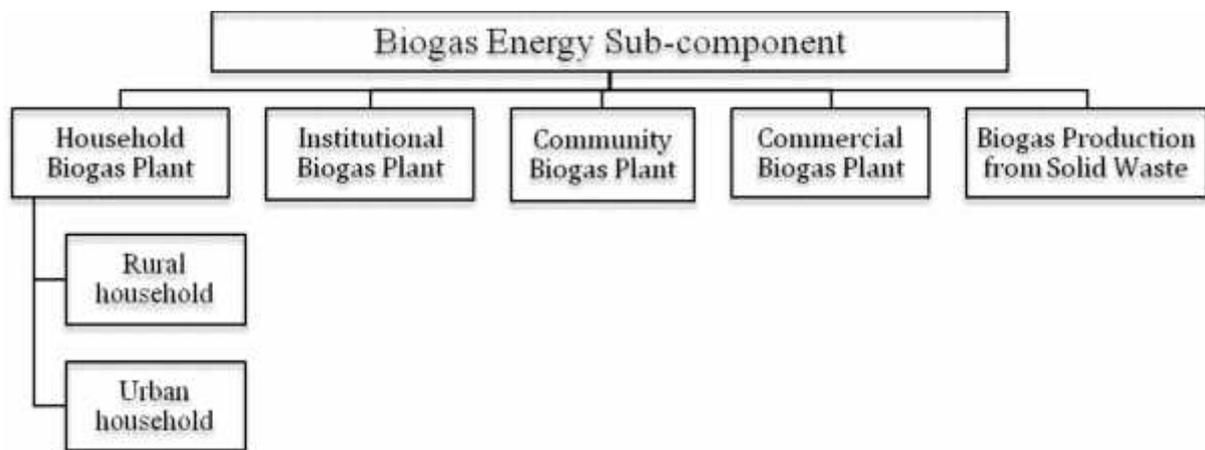


Figure 10: Map of Biogas Energy.

As referred in the Subsidy Delivery Mechanism, the technical standards are prescribed by AEPC in HH Biogas Plant Construction Guidelines 2-8 m³ which specifies plant design, measurement, plant capacity, contractual arrangements between users and company, completion report, guaranty arrangements and after sales services.

¹Training and orientation to AEPC staff on certain key aspects these documents would be useful.

Other types of biogas plants are more than 12 m³ and categorised as large-scale plants, and their technical standards for quality assurance will be as per the **detail design report (DDR)**. **Biogas Plant Commissioning Testing Guidelines – July 2014** for large-scale biogas has provisioned a number of tests for their quality aspects such as **Construction Completion Test**, and **Performance Tests**, and guaranty arrangements.

Construction of large-scale biogas plants has to be backed-up by thorough feasibility studies and for their construction manual is also designed. Quality assurance processes may also take note of this factor.

5.1.5 Biomass energy

In reference to the **RE Subsidy Delivery Mechanism (2013)** and **Service Delivery Guidelines for DDC/EECCSs (2014)**, the biomass energy technologies are as presented in the Figure 11 below.

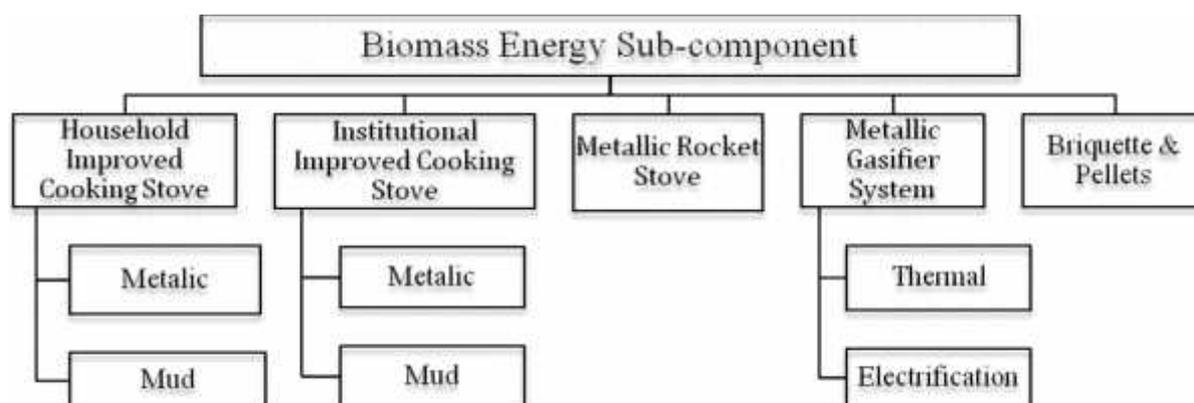


Figure 11: Map of Biomass Energy.

The **Service Delivery Guidelines for DDC/EECCSs (2014)** has been prepared to guide DDCs/EECCSs to implement the Biomass Energy technologies. This document provides standard procedures to be followed while implementation of activities under BESC as well as serves as the main basis for examining and evaluating quality of services delivered at field level.

5.2 Monitoring process

There exist elaborated monitoring processes and methodologies of GoN, AEPC/NRREP, local bodies and all related partner organisation/agencies including NGOs, Designated National Partners (DNPs), companies, and Local Partner/Support Organisations. Different components of AEPC/NRREP has been applying a range of tools and methodologies to conduct monitoring activities. Therefore, in this report efforts have been made to pull them together in order to enhance accessibility of them from a single platform.

In the following paragraphs and tables under this Section, the monitoring processes of AEPC/NRREP sub-components have been analytically presented in terms of purpose of monitoring, methodologies, timing, parameters and responsibilities to monitor those. The existing practices as revealed by various documents for respective sub-components vary depending on the nature and type of RET, the nature of works involved in developing/construction/installation of RETs and volume of monitoring work that would be required for respective components.

As mentioned earlier, the rigour of monitoring also depends on the need for quality assurance and subsequent regulatory actions to be performed.

5.2.1 Monitoring of activities under Solar Energy Sub-Component

Reference to the **RE Subsidy Delivery Mechanism (2013)**, the following Table 1 presents an analytical summary for monitoring processes of solar energy sub-component. It is also important to note here that although the solar PV system could be considered for household community electrification, the monitoring processes are same for all solar technologies with different sample size. It is because of the fact that solar energy technologies are like “off-the-shelf” technologies.

Table 1: Analytical summary for monitoring processes of Solar Energy Sub-Component

S.N.	Purpose	Methodology		When	Parameters to monitor	Responsibilities	Remarks
		Approach	Tools				
1	Observation /supervision of installation	Field inspection/ monitoring by Section/Unit or through Independent Consultant, as much as possible.	Technical standards, agreements with the company	During installation, monthly records	i) Is installation happening through PQ company or not? ii) Is system as per pre-determined standard or not?	DEECCS and RSC, AEPC	Recommendations to be made for further investigation, quality assurance and/or regulatory actions.
2	Performance evaluation of company	By independent consultant, 10% of the total installed system selected through random sampling.	Field investigation of randomly selected installed systems.	Upon completion	i) Check the quality standards. ii) Locate and verify the installed system. Iii) Find out any irregularities, such as, whether or not subsidy claim made without installation, any mistake, whether or not the used equipment as per standard. Iv) Whether or not the installed equipment need to be checked by RE Test Station.	AEPC to hire independent consultant.	

5.2.2 Monitoring of activities under Community Electrification Sub-Component

Monitoring processes of Hydropower technologies have been covered in this section. The **RE Subsidy Delivery Mechanism (2013)** is the key reference document regarding monitoring of this component. As mentioned before, the elements of quality assurance form integral part of monitoring. Reports of DFS are the key bases determining monitoring requirements. Mini-hydropower technologies are new mandates under AEPC/NRREP for which **Above 100 kW to 1000 kW leaflet, Manual of Mini Hydropower Survey and Design Tools (2014)** and **Mini Hydro DFS Guideline (2014)** have been developed and they need to be referred for effective quality assurance as well as monitoring. In the following Table 2, an analytical summary of monitoring processes of community electrification sub-component has been presented.

Table 2: Analytical summary of monitoring processes of community electrification sub-component.

S.N.	Type	Purpose	Methodology		When	Parameters to monitor	Responsibilities	Remarks
			Approach	Tools				
1	All types of hydro-technologies (i.e. Pico-IWME-Micro-Mini)	Observation /supervision of installation	Regular and timely visit to sites.	DFS prescriptions	At different stages of installation	i) Check whether or not the works are progressing as per DFS? ii) Check quality aspects of workmanship and materials used? iii) Find out any possible irregularities or errors in the processes and rectification thereof.	DEECCS and RSC, AEPC, Company	
		Impact evaluation and user satisfaction	By hiring independent consultant	Detail investigation /study	Every two years after installation	i) Project impact ii) User satisfaction	AEPC to hire independent consultant.	In case of IWM, 10% will be covered and performance evaluation of service centre, local partner organisation and manufacturing company.

		Public hearing	Participatory	Public hearing	Before start of project construction and after completion of project construction.	Dynamics of the process	Project developer /company	DEECC and RSC to coordinate and facilitate the hearing process.
2	Up to 10 kW hydro-power projects	Electricity generation and household verification of at least 50 percent projects.	By hiring independent consultant	Detail investigation /study	After completion	Power output and other details	AEPC to hire independent consultant.	
3	> 10 to 1000 kW hydro-power projects	Electricity generation and household verification of all projects.	By hiring independent consultant	Detail investigation /study	After completion	Power output and other details	AEPC to hire independent consultant.	In the presence of representatives of the service centre, Section/Unit and project developer

5.2.3 Monitoring of Bio-gas Sub-Component

The **RE Subsidy Delivery Mechanism (2013)**, **Monitoring Guideline for Biogas by Third Party (2013)** and **Biogas Plant Commissioning Testing and One-Year Guaranty Monitoring Guidelines (2014)** are the key reference documents for monitoring of Biogas Sub-Component. As mentioned before, the elements of quality assurance form integral part of monitoring. In the following Table 3, an analytical summary of monitoring processes of bio-gas sub-component has been presented.

Table 3: Analytical summary of monitoring processes of bio-gas sub-component.

S.N	Purpose	Methodology		When	Parameters to monitor	Responsibilities	Remarks
		Approach	Tools				
1	Internal quality control measures or First Party Quality Control	Field inspection/ monitoring for 100% quality checking of plants and appliances handed over to the users	Plant design, technical standards, plant capacity	Before, during and after construction & manufacturing.	i) Is installation happening using quality materials? ii) Appropriate appliance used or not?	Bio-gas construction company	This should avoid rework, wastage of time, money and resources

2	Quality monitoring during the construction and manufacturing process, after the construction of plants/appliances and assessing the situation of after sales service provided by companies. Or Second Party Quality Control	Designated party will follow the methodology developed by AEPC and as per the prescribed sample size.	Field investigation of sample location and plants	Before, during and after construction & manufacturing.	i) Check the quality standards. ii) Locate and verify the installed system. iii) Find out any irregularities, such as, whether or not subsidy claim made without installation, any mistake, whether or not the used equipment as per standard.	Designated national party (DNP). At present BSP-N is the DNP.	AEPC to train the DNP
3	Third Party Monitoring or monitoring by other than DNP and companies	Detail study or investigation	Field research	After completion of construction work.	i) Check whether approved design followed or not? ii) Check if quality components have been used for plant construction or not? iii) Check if quality appliances delivered by company or not? iv) Check if companies have been providing after sale services or not? v) Check if subsidy has been properly disbursed to users or not?	Independent consultant.	Collection and compilation of field information and listing of deviated cases of plants provided as sample by AEPC. If deviation identified, they should be categorized as prescribed in the guidelines.
4	Other monitoring	i) Random field monitoring by AEPC staff and district unit together with partner NGOs in the region. ii) Based on complains. iii) CDM monitoring for registered plants. iv) Financial audit team monitoring for <2 years old plants. v) Process oriented internal quality control monitoring by for <2 years old plants.		As and when required.	As per purpose.	i) AEPC, DEECCS, NGOs, ii) AEPC iii) AEPC iv) Audit v) DNP	

5.2.4 Monitoring of Biomass Energy Sub-Component

The RE Subsidy Delivery Mechanism (2013), Service Delivery Guidelines for DDC/DEECCs for Implementation of BESC (2014) and Guideline for Random Sample Monitoring are the key reference documents for monitoring of Biomass Energy Sub-Component. Technical Monitoring Format, MICS Field Inspection Form and Mud ICS Field Inspection Form have also been designed to facilitate the processes. As mentioned before, the elements of quality assurance form integral part of monitoring. In the following Table 4, an analytical summary of monitoring processes of biomass energy sub-component has been presented.

Table 4: Analytical summary of monitoring processes of biomass energy sub-component.

S.N.	Purpose	Methodology		When	Parameters to monitor	Responsibilities	Remarks
		Approach	Tools				
1	Technical monitoring support visits to evaluate progress in qualitative and quantitative terms and also suggest possible improvements.	i) 25% of installed stoves; and ii) first 10 ICS installed by the Stove Master to mandatorily monitored.	Annex 7 (a) of Biomass Energy Sub-component Service Delivery Guidelines for DDC-DEECCs.	i) During installation and post installation. ii) During installation.	As per Annex 7 (a)	DDC/DEECCS	
2	Random Sample Monitoring as per sample provided by AEPC's MIS database.	i) Ideally 20 samples per district each trimester or at least 10% of installed stoves. ii) As per need, AEPC will hire independent consultant as third party to monitor for the same selected sample households.	Annex 7 (b) and (c) of - Service Delivery Guidelines for DDC-DEECCs.	During installation and post installation after one year of installation.	As per Annex 7 (b) and (c)	DDC/DEECCS, and Independent consultant	
3	Participatory monitoring once a year to create ownership, verify progress and thus get feedback for improving delivery of services.	With involvement of District and VDC Level Action Committees.	Interaction with users	Once a year at convenient time of stakeholders	The monitoring will check whether ICS have been installed as per reports, their functionality and satisfaction level of users.	DEECCS to coordinate and facilitate the process	

4	Case based and special monitoring to recognise exceptional achievement or to rectify misconduct reported.	Site visits	Investigation	As per need	As per the case.	DDE/DEECCS or AEPC or third party hired by AEPC	
5	Post monitoring of Indoor Air Pollution (IAP) free declared VDCs to ensure status of continued use of ICS and their conditions.	Visits to rural HHs	Interaction with users for response and investigation	After the programme is phased out.	Condition of stoves, repair and maintenance, and feelings/response of users on the use of stove.	DDC/DEECCS	
6	Performance evaluation of DDC/DEECCS	Review of reports and field inspection	Interactions, direct visits, inspections	Every six month	<ul style="list-style-type: none"> i) Streamlining of GESI concept at all levels ii) Achievement of physical outputs iii) Timely submission of reports and quality of reports iv) Efficient management of DSCs v) Technical quality and functionality of stoves Transparency and accountability vi) Smart communication 	AEPC/NRREP	

5.3 Regulatory provisions

5.3.1 Regulating Solar Energy Sub-Component

5.3.1.1 Solar Thermal energy

The **RE Subsidy Delivery Mechanism (2013)** provides regulatory provisions for Solar Thermal Energy (page 5-8) as presented in the Table 5 below.

Table 5: Regulatory provisions for Solar Thermal Energy.

S.N.	RET	Subsidy retention	Requirements with subsidy application				Punishment and Penalty				
1	Domestic Solar Dryer	10% of total subsidy	The qualified installer company or its qualified agent/seller shall be required to install the household solar dryer as per the approved design by using the goods and equipment as per the technical standard of AEPC.	The qualified installer company shall be required to request for subsidy in the format of application prescribed by the REF.	While submitting the application, it must be submitted by attaching two color photographs. In the first photograph, the user with user's manual positioned at the side of dryer must be clearly	The qualified installer company shall be required to request for subsidy in the format of application prescribed by REF.		Upon completion of one year of subsidy delivery, at least 10% of the total installed	The field monitoring data shall be evaluated by keeping such data in the management information system database and this also will be taken as the basis for performance evaluation and grading of the companies. The data shall also be used to penalize to the companies if the after sale service	In addition, the Renewable Energy Test Station shall carry out the field study and investigati	A copy of monthly record of the installed system shall be required to submit to the Service

2	Medium and Large Scale Solar Dryer		Eligibility: Private company, industry, institution and community institution, which are registered in the concerned and are carrying out the agro business	The non-profit oriented institution shall be required to submit the institution renew certificate and recommendations of VDC and DDC, and the profit oriented institution shall be required to submit the tax payment certificate of the previous fiscal year.	visible. Similarly, in the second photograph, the user with users' manual positioned next to the seller/distributor at the side of the dryer must be clearly visible. In addition to these, a copy of the Nepalese Citizenship Certificate, mobile or phone number and sketch	The user shall be required to fill up the feasibility study form and submit the report to AEPC by itself or through the qualified installer company or its qualified agent/seller for the purpose of subsidy for medium and large solar dryer. AEPC shall evaluate the report and recommend to the REF for subsidy if it is ensured that the project has met all the criteria.	The qualified installer company and its qualified agent or seller shall be required to provide the after sale service free of charge at least one time within a year of installation.	The qualified installer company and its qualified agent or seller shall be required to provide a manual containing all drawings relating to the repair and maintenance, use and installation, to the user.	system will be selected through random sampling as sample and field monitoring will be carried out thereof through the qualified consulting institution.	has not been provided, if the defect or less quality goods and equipment have been used, if subsidy has been claimed twice, or if found any other kind of irregularity. The maximum limit of the punishment and penalty will be cancellation of Prequalification of a company. In addition to the field monitoring to be carried out by the independent consultant, the REF, AEPC, and Section/Unit shall carry out the field monitoring and inspection regularly or as per the need.	on of all technical aspects and provide a report thereof to the concerned company as feedback for necessary rectification.	Centre of concerned district, Section/Unit, REF and Centre in a format prescribed by AEPC on district to district basis.
3	Domestic Solar Cooker		Eligibility: Priority to household solar cooker in the rural area, and first priority to backward groups.	The qualified company and its qualified agent/seller must install the household solar cooker as per certified design by using the materials and equipment as per the technical standard of AEPC.	to locate the house address easily are also to be provided.	The qualified company must request for subsidy in an application format prescribed by AEPC.						

5.3.1.2 Solar Photovoltaic Energy

The **RE Subsidy Delivery Mechanism (2013)** provides regulatory provisions for Solar PV Energy (pages 8-14) as presented in the Table 6 below.

Table 6: Regulatory provisions for Solar PV Energy.

S.N.	RET	Subsidy retention	Requirements with subsidy application									Punishment and Penalty				
1	Above 10 WP Solar PV System															
1.1	Institutional Solar PV System	10% of total subsidy	The subsidy will be provided to the legally registered public institutions only.	The equipment to be used in this shall be as per the specifications mentioned in the Nepal Photovoltaic Quality Standard and such materials and equipment must be certified by the Renewable Energy Testing Station. The engraved number should be mentioned in solar panel and battery to be used in such system.	The manufacturing, supply and installation must be done only by those companies qualified by AEPC.	The design and feasibility study as well as supervision of installation process must be done by technicians associated with the qualified companies.	For the purpose of management of battery to be used in the solar energy, the amount mentioned in the battery voucher will be deducted from the subsidy amount, which shall be deposited by opening a separate account and used in the management of battery. But such to be deducted amount shall not be more than 5 percent of the subsidy amount.	The concerned institution shall be required to select the company through the competitive process through sealed quotations regarding the estimated cost, installation, warranty etc. of the solar energy system from at least three qualified companies in a format prescribed by AEPC, and carry out the feasibility study in a prescribed format; and the concerned institution shall be required to submit an application to AEPC by attaching the recommendation letter of VDC or DDC, and the feasibility study report with commitment to bear at least 25% of the total cost.	Before installation of institutional solar PV system, the company shall be required to fill up a subsidy application form and submit to AEPC; and the company, after approval of the subsidy by the REF, must have agreement with the supplier, selected for equipment supply, installation and other services for the institutional solar PV system.	The institution shall be required to sign agreement with AEPC with regards to ownership, supervision and repair and maintenance of the system.	If subsidy is claimed by the company without installing the solar energy equipment or if the equipment is installed other than the prescribed place or if the solar energy system is installed with the capacity other than the prescribed capacity, the penalty equivalent to 300 percent of the subsidy amount shall be imposed and the prequalification of the company will be terminated.	If it is observed that the damaged, unapproved and obsolete spare parts (solar panel, battery, charge controller etc.) have been installed, the penalty shall be imposed up to 200 percent of the approved subsidy amount as mentioned in quotation or the subsidy application form.	If any irregularity is observed while carrying out the field monitoring by AEPC itself or through the consultant appointed by AEPC, the prequalification of the company shall be terminated.	If the company did not provide the after sale service within the warranty period or up to two years, the remaining 10 percent subsidy amount will be provided for the repair and maintenance of respective solar energy system as per the need.	If the company did not provide after sale service to the systems more than 10 percent of the total system installed by it or if the company did not reach in the concerned place within one month after receiving the written complaint within the warranty period, the company will be suspended for a period up to six months.	If it is observed that the company did not provide the after sale service thereafter as well, the eligibility of the company will be terminated.

1.2	Rural Community Solar PV Water pumping System		The subsidy will be provided to the prescribed rural community solar water system in the area where there is no electrification has not been done through any other means.	The materials and equipment certified by the Renewable Energy Testing Station must be used.	The technical standards prescribed by AEPC must be met while constructing the project. In the case of civil works, it must be done as per the guidelines approved by AEPC.	The construction works of the civil structure can be done by the Users Committee by itself or also through the company supplying and installing the electrical and mechanical equipment. But in the case of User Committee, the electrical and mechanical equipment installing company shall be required to ensure that the civil structure to be constructed by the committee is as per the prescribed standards.	It should be verified that the solar water system has been installed under the supervision of the technician associated with the concerned installer company.	A completed application form prescribed by AEPC should be submitted for the construction of the project. The subsidy request has to be made by filling up the subsidy form prescribed by REF.	The targeted group should submit an application to AEPC through the Section/Unit or Service Centre for the additional subsidy.	The Service Centre should prepare the technical and financial & social feasibility study reports and submit again to the Centre.	If it is observed that the company has claimed for subsidy amount without installing the system, installed the system in the place other than the prescribed place, done mistake while installing the system or done irregularity or used equipment, which are against the prescribed standard, penalty shall be imposed as per the prescribed quality assurance and monitoring guidelines.
2	Less than 10 WP Solar PV System	There is no provision prescribed									

5.3.2 Community Electrification

The **RE Subsidy Delivery Mechanism (2013)** provides regulatory provisions for pico, micro and mini hydropower projects (pages 33 - 44) as presented in the Table 7 and 8 below.

Table 7: Subsidy criteria and delivery process.

S.N.	RET	Requirements with subsidy application			Financial support for DFS	Subsidy delivery process				
1	Up to 10 kW (pico and IWME) hydropower projects	Feasibility study is developer's responsibility utilising qualified technicians in facilitation of DEECCS or RSC	Developer to submit prescribed requisition form and submit to concern DEECCS or RSC.		50 percent of amount will be provided after completion and submission of detailed study report and remaining 50 percent amount will be provided through the DDC after decision of the Pico Hydro Technical Review Committee (TRC).	The payment of subsidy for the Pico hydropower project will be done through DDC.	Developer to submit DFS to DDC and DDC will approve conditionally the financial and technical viability of the project. Also inform to AEPC.	Developer sign contract with companies after assurance of 75% of total cost including subsidy.	DDC shall recommend AEPC for release of subsidy after final approval as per the standard mentioned in the guideline.	Installments: 1st 50% upon recommendation of developer; 2nd 40% after 72 hours of successful operation of project; and 3rd/final 10% after successful completion of one year (Please refer pp 40-41 of Subsidy Delivery Mechanism).

2	> 10 to 100 kW (micro) hydropower projects.	The interested project developer should fill up the prescribed project requisition form and submit to the concerned service centre or Section/Unit.	The preliminary survey work of the project will be done by the service centre or Section/Unit based on the site identification and verification done by AEPC using GIS.	For the purpose of carrying out the detailed survey, the project developer should get at least three sealed quotations from among the companies qualified by AEPC through competitive basis and select the company.		The detailed survey and design should be carried out through the technical persons qualified by AEPC. The service Centre should examine and assess the detailed survey and design report and forward to AEPC along with the letter of recommendation of the concerned DDC.	40 percent amount will be provided on the recommendation of the service centre after completion and submission of detailed study report and 40 percent subsidy amount after recommendation of the TRC. The remaining 20 percent amount will be paid only after approval of the drawings of the project and the report of the quality monitoring done during the construction of the project by AEPC. However, the remaining 20 percent subsidy amount will not be provided to such project in case of the subsidy not approved for the construction of that project.	DFS to be approved by Technical Review Committee (TRC)	Developer sign contract with companies after assurance of 75% of total cost including subsidy.		Installments: 1st may be up to 60%; 2nd 30% upon successful operation for 72 hours as per specification of capacity; 3rd 10% upon submission of test generation and handover report; and final 10% upon successful completion of one year (Please refer pp 42-44 of Subsidy Delivery Mechanism).
3	>100 to 1000 kW (mini) hydropower projects	The interested developer should fill up the prescribed project requisition form and submit to the concerned service centre or Section/Unit along with the license received from the Department of Electricity Development.	AEPC, upon request of the project developer, will select the company as per the prevalent laws. The selected company should prepare the detailed survey and design report as per the detailed feasibility study guideline prescribed by AEPC and submit it to the concerned service centre.	The service Centre should examine and assess the detailed survey and design report and forward to AEPC for approval technical and subsidy along with the letter of recommendation of the concerned DDC.		AEPC along with the letter of recommendation of the concerned DDC.			Developer sign contract with companies after assurance of 90% of total cost including subsidy.		

Table 8: Punishments and penalty.

S.N.	RET	Punishment and Penalty												
1	Up to 10 kW (pico and IWME) hydropower projects	DFS have be submitted within 3 months of from the date of signing the agreement							The installer should provide warranty for three years in the mechanical equipment and one year in the electrical equipment. The installer should conduct regular inspection at least once during the warranty period and provide suggestions to the project developer for improvement in the operation and management. The installer will not be responsible for solving the problem arising from the inappropriate working style, material and supervision.					
2	> 10 to 100 kW (micro) hydro power projects.	DFS have be submitted within 3 months of from the date of signing the agreement	If the report is not submitted within that period, the penalty will be levied at the rate of 1 percent of the financial support amount per week but up to 10 percent of the subsidy amount.	If the penalty reaches more than 10 percent, the agreement will be terminated automatically.	While carrying out the field verification by installer company, if the deviation by more than 10 percent is observed in the capacity of the project and the quantity of transmission and distribution, the company which did the DFS should carry out the DFS again at its own cost.	If that company did not carry out the feasibility study again or the deviation by more than 10 percent is observed in the capacity of the project and the quantity of the transmission and distribution, AEPC will terminate the qualification of that company.	If any dispute arises between the company carrying out the detailed feasibility study and the installer company, the decision of AEPC shall be final.	If the actual capacity is less than the estimated generation capacity at the time of design of the project, the final subsidy will be determined accordingly. The remaining subsidy amount will be paid after deducting reduced subsidy amount from the second installment.						
3	>100 to 1000 kW (mini) hydropower projects	DFS have be submitted within 6 months of from the date of signing the agreement												

5.3.3 Bio-gas

The **RE Subsidy Delivery Mechanism (2013)** provides regulatory provisions for biogas energy projects (pages 14 - 20) as presented in the Table 9 below.

Table 9: Regulatory provisions for biogas energy.

S.N.	RET	Subsidy retention	Requirements for subsidy claim, punishment and penalty							
1	Rural household biogas plant	10%	Only pre-qualified companies are eligible.	Company should submit work completion form and other necessary documents to Technical Service Provider (TSP) institution selected by AEPC.	TSP should do the necessary examination and evaluation of the plant construction completion forms submitted by the biogas company and should submit the report and necessary documents to AEPC along with the recommendation for the subsidy.	The AEPC shall do necessary assessment of the application received and shall recommend to the Renewable Energy Fund (REF) for the subsidy after ensuring of the fulfillment of all criteria for the subsidy. The REF shall disburse 90 percent of the subsidy amount to be provided to the user through the qualified companies if it finds appropriate after doing the necessary examination and evaluation.	If the service and works mentioned in the guideline have been found satisfactory, the release of payment of the 10% remaining subsidy amount will be recommended to the REF.			
2	Urban Household Biogas	10%								
3	Institutional Biogas Plant	10%	The subsidy will be provided to those biogas plants constructed through the qualified companies as per the technical standard prescribed by AEPC.	The institution wishing to construct the plant should submit an application to AEPC along with its decision to construct the biogas plant and the pre-feasibility study report thereof prepared by the qualified consultant.	AEPC shall evaluate the report and recommend for detailed survey which should include the financial, technical and environmental aspects as well, if it deems necessary.	The concerned institution should carry out the detailed feasibility study through the consultant recognized by AEPC as per the approved standard and submit the report. After receiving the pre-feasibility study report or detailed feasibility study report, AEPC will examine and evaluate such report and will approve to construct the biogas	The qualified companies should submit the report to AEPC along with the plant construction completion form, recommendation letter and other necessary documents.	The AEPC shall recommend the subsidy to the REF by ensuring the fulfillment of all the criteria for the subsidy. If the REF finds appropriate for the subsidy after necessary examination and evaluation, it will release the 90 percent of the subsidy amount to the user through qualified company.	If the service has been found satisfactory, AEPC shall recommend to the REF for release of remaining 10% subsidy amount.	If the service is not found satisfactory, the amount will be utilized for the repair and maintenance of the biogas plant.

						plant if it determines feasible.				
4	Community Biogas Plant	10%		The concerned users committee must arrange the land required for construction of the plant. If such land is under the public or Government ownership, an application has to be submitted along with their consent.	While submitting an application by the community, ... pre-feasibility study report prepared by the qualified consultant has also to be submitted along with the application. AEPC shall evaluate the report and recommend for detailed survey.	The concerned institution should submit the DFS carried out through the consultant recognized by the AEPC as per the approved standards. AEPC will provide the permission to construct the biogas plants after examination and evaluation of the pre-feasibility or DFS report if it determines feasible.	The qualified companies shall be required to submit the report with recommendation for subsidy to the AEPC along with the plant construction completion form and other necessary documents. AEPC shall recommend to the REF for subsidy by ascertaining that all the criteria for the subsidy have been fulfilled. If the REF finds appropriate for the subsidy after necessary examination and evaluation, it will release 90 percent of the subsidy amount entitled by the user, through the qualified company or the installers.			
5	Commercial Biogas Plant	10%	The enterprise interested to construct the plant has to submit an application along with a copy of the company or industry registration certificate, a copy of decision of the Board of Directors or Management Committee and the pre-feasibility study report prepared by the qualified consultant.	AEPC shall study such report and recommend for the detailed feasibility study if it sees having fulfilled the prescribed standard.	The company/enterprise has to start the construction after getting approval from AEPC after submission of detailed construction plan by the qualified construction company along with the detailed feasibility study.	The qualified companies have to submit the application to AEPC along with the plant construction completion form and other required documents.	AEPC shall recommend to REF for subsidy after ascertaining that all the criteria for the subsidy have been fulfilled. REF will examine and evaluate the application form and other document received and will approve the subsidy if it determines that all the processes have been fulfilled. If the concerned installer or company wants to get the subsidy amount against the bank guarantee, the REF may provide up to 40 percent of the total subsidy amount as an advance. AEPC will examine and evaluate, and recommend to REF for payment of 50 percent of the total subsidy amount after submission of report by the company by completing the construction works.			

6	Biogas Production from Solid Waste	5%	Institutions or companies wishing to generate energy from the solid waste shall be required to submit an application to AEPC in concurrence with the approval of the concerned municipality or VDC along with the registration certificate, tax payment certificate and document clearly showing the financial and technical capacity of the institution. The pre-feasibility study report prepared by the qualified consultant shall have to be submitted along with the said application.	AEPC shall study such report and recommend for the detailed feasibility study if it sees having fulfilled the prescribed standard.	A tripartite agreement should be signed for the construction of the plants among AEPC, concerned municipality or VDC and private company or institution. Even though the ownership of the plant has to be taken by the municipality, the responsibility for operation and management of the plant may be entrusted to the private company or institution.	The company or institution wishing to manage the solid waste should submit the detailed construction plan along with the detailed feasibility study report. The concerned company or institution shall be required to start the construction of plant only after approval by AEPC.	The qualified companies or institutions wishing to generate energy from the solid waste should submit an application to AEPC along with the plant construction completion form and other necessary documents.	AEPC shall recommend to REF for subsidy after ascertaining that all the criteria for the subsidy have been fulfilled. REF will examine and evaluate the application form and other document received and will approve the subsidy if it determines that all the processes have been fulfilled. If the concerned installer or company wants to get the subsidy amount against the bank guarantee, the REF may provide up to 40 percent of the total subsidy amount as an advance. AEPC will examine and evaluate, and recommend to REF for payment of 50 percent of the total subsidy amount after submission of report by the company by completing the construction works.	The company or institution wishing to generate the energy from the solid waste should guarantee to provide after sale service for at least twice in the four years of period after the plant comes into the operation. AEPC shall recommend to REF for payment of 5 percent subsidy amount after the first after sale service is rendered. AEPC will recommend the payment of remaining 5 percent subsidy amount after the second after sale service is rendered.	If it is observed that the company or institution wishing to generate the energy from the solid waste did not provide the first and second after sale service, 25 percent amount of the subsidy amount will be charged from such company or institution as penalty.
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5.3.4 Bio-mass

The **RE Subsidy Delivery Mechanism (2013)** provides regulatory provisions for biomass energy projects (pages 20 - 25) as presented in the Table 10 below.

Table 10: Regulatory provisions for biomass energy projects.

S.N.	RET	Subsidy retention	Requirements for subsidy claim, punishment and penalty					
1	HH Metallic Improved Cook Stove	10%	The subsidy will be provided to the approved standard metallic stove of one pot hole, two pot holes or three pot holes model prescribed by AEPC to HHs located at or above 1500 masl	The stove should be installed by the trained technician of the installer company qualified by AEPC.		After installation of improved metallic stove, the prescribed filled subsidy form should be submitted along with a copy of citizenship of the user, two copies of photographs of the kitchen of the house with stove installed. In the first photograph, the user, installer, installed stove and the parts of outlet pipe inside the room must be clearly visible. In the second photograph, the user and installer sitting together making the outer part of the kitchen in the house as background and the outlet pipe coming out from the kitchen must be clearly visible.	The qualified company should guarantee that the after sale service has been provided after installation of the stove.	AEPC or independent consultant selected by AEPC and Section/Unit will monitor whether the after sale service has been provided satisfactory or not. AEPC will take the basis of the report of the Section/Unit for the payment of the after sale service fee. If the service is found to be satisfactory, it will recommend for the disbursement of the remaining 10 percent subsidy amount to the REF. If the service is not found to be satisfactory, the amount to be paid for the after sale service will be used for the repair and maintenance of the improved cooking stove.

2	Institutional Metallic Improved Cook Stove		The subsidy will be provided to the metallic stove of approved standard with two pot holes or three pot holes model prescribed by AEPC.		The institution wishing to install the metallic improved cooking stove should submit an application to the Section/Unit along with request letter and the decision of the board of directors or management committee of the institution and a copy of registration certificate of the institution. The DD.C will examine and evaluate the application and the documents submitted along with the application and will provide approval to the qualified installer company if it is confirmed that the necessary processes have been fulfilled. After getting the approval, the company should install the stove and submit the duly filled up subsidy application and all documents to AEPC for payment of subsidy.	After installation of metallic improved cooking stove, the prescribed application form has to be filled up and two photographs of the kitchen of the institution shall have to be attached therewith. In the first photograph, the representative of the institution, installer, installed stove and the parts of outlet pipe within the room must be visible clearly. In the second photograph, the representative of the institution and installer sitting together making the outer part of the kitchen in the house as background and the outlet pipe came from the kitchen must be visible clearly.	The qualified company should ensure that the after sale service has been provided after installation of the stove.
3	Metallic Rocket Stove					After installation of metallic rocket stove, the prescribed application form should be submitted along with a copy of the citizenship certificate and a photograph of the user and installer with kitchen and stove in the background. In the case of the chimney installed, another photograph of the user and installer sitting together showing the outer part of the house/kitchen in the background and pipe coming from the kitchen shall also be attached.	

6. Conclusions and recommendations

This study has attempted to pull together and consolidate the guidelines, procedures, directives and necessary tools that AEPC/NRREP has issued for undertaking quality assurance, monitoring and regulating the RET promotion in Nepal. This document and its digital accessibility of essential documents and tools for monitoring, assuring quality and regulating the RET promotion can be expected to address the concerns of lack of coordination and limited institutional learning. In order to optimise the utility of this document following could be done:

- Carry out an additional study on identifying gaps and address those with relevant provisions for quality assurance, monitoring processes and regulatory actions;
- Encourage all AEPC/NRREP officials from top to bottom in familiarizing this as a tool as well as go through building minimum knowledge and understanding of cross energy technologies.

References

All documents enclosed in digital forms as per the ToR.

Annexes

Annex 1: Overall objective, the scope of work and deliverables

Overall objective	Scope of Work (Activities)	Deliverables (Outputs)
<p>To prepare an integrated and systematized documentation of ‘Monitoring and Quality Assurance Guideline’ of NRREP so that all obligatory organizational policies, technical standards, strategies, regulations, tools, process etc related to monitoring are clear and easily obtainable for the use in digital format integrated with AEPC website.</p>	<p>1. In line with the objective of the assignment, the Consultant will gather all the existing relevant documents, guidelines, manuals, forms, formats, tools etc including but not limited to the following:</p> <ul style="list-style-type: none"> • Renewable Energy Policy; • Renewable Energy Subsidy Delivery Mechanism; • Implementation Guidelines of all the AEPC/NRREP-supported RETs; • Monitoring/Verification and Quality Assurance Guidelines of all the RETs supported by AEPC/NRREP; • Demand collection/application forms/formats & monitoring/verification forms/formats of all the RETs supported by AEPC/NRREP; • Documents on Technical Standards of all the AEPC/NRREP-supported RETs; • M & E Framework of AEPC/NRREP; <p>2. Through study of the collected documents, and also acquiring pertinent information through consultation with the concerned AEPC/NRREP sub-components & units, the consultant will: a. collect/compile pertinent information on implementation modalities, delivery mechanisms, and monitoring & quality assurance mechanisms of all the AEPC/NRREP-supported RE technologies;</p> <ul style="list-style-type: none"> • Identify unclear or vague areas (if any) in the existing guidelines and other relevant documents. • Elaborate or clarify vague provisions as appropriate and recommend suitable provision/s; • Identify the areas (if any) covered in the RE Policy but not incorporated/addressed in 	<ul style="list-style-type: none"> • Inception Report with conceptual framework, table of contents, methodology/process, strategy, and action plan both in electronic and hard copy for initial review and comments (within 15 days after signing the contract) • Draft document for comments and suggestions (within 40 days after signing the contract) • A single folder containing HTML pages with all digital copies (word/pdf) of document is it to be submitted. It should contain all features including search and navigation. • Final document (appropriate digital file; word or PDF) and two hard copies.

	<p>respective Guidelines, and recommend suitable/simplified provision/s for the same;</p> <ul style="list-style-type: none"> • Separate technical standards, monitoring/verification guidelines and regulatory guidelines from the existing documents and rewrite or reassemble them in the format of these three separate chapters. <p>3. Prepare a well structured, streamlined and workable single document which clearly & precisely describes/explains delivery/implementation modality, step by step procedure for monitoring/verification, quality control/assurance, regulatory guidelines of each RE technologies annexing all the relevant Forms/Formats/Guidelines/Technical Standards. The same single document should be made available into HTML formats organized by thematic groups and subjects. The user can download individual or all documents in PDF formats. There should be provision for search and easy navigation.</p> <p>4. Submit a proficient draft document to AEPC/NRREP for feedbacks within one month signing the contract.</p> <p>5. Prepare final document incorporating all received feedbacks/comments.</p>	
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Annex 2: The proposed portal