
**Compliance market incentives for Agro-industrialisation —
Guideline**



Compliance with this standard does not, of itself confer immunity from legal obligations

A Uganda Standard does not purport to include all necessary provisions of a contract. Users are responsible for its correct application

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Foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Trade, Industry and Cooperatives established under Cap 327, of the Laws of Uganda, as amended. UNBS is mandated to co-ordinate the elaboration of standards and is

- (a) a member of International Organisation for Standardisation (ISO) and
- (b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and
- (c) the National Enquiry Point on TBT Agreement of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of key stakeholders including government, academia, consumer groups, private sector and other interested parties.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

The committee responsible for this document is Technical Committee UNBS/TC 2, *Food and Agriculture*.

The work of preparing this guideline was carried out through a working group selected from different stakeholders in accordance with procedures for development of Uganda Standards. The guideline was then validated by relevant Technical Committees on Food and Agriculture, clean energy, quality, health, safety, & ICT.

Introduction

This guide is not a new “standard” per se. Rather, it is a logic to restructure enforcement of already existing standards in areas of clean energy, sustainable nature based / organic agriculture, health, quality, safety and ICT to ensure they are enforced in a singular cascade as a bundle, rather than in sectorial silos as traditionally done. The aim being to regularize processes, products & services critical to establishing sustainable agriculture led, clean energy powered industrialization enterprises with ICT enabled linkages to markets & supply chains. Such enterprises derived from Africa’s comparative advantage sectors of sustainable agriculture & clean energy offer the shortest route for most if not all African countries to industrialize and achieve global competitiveness. These are postulated as the strategic thrust engine that will accelerate implementation of shared climate aims (the NDCs) and socioeconomic priorities of food security, creation of income & job opportunities and expansion of macroeconomic growth – eloquently captured in National Development Visions of nearly all countries across the continent.

This guide therefore is about leveraging on already existing standards to create a new market incentive for producers to drive agro-industrialization by tapping into market opportunities among health, climate / environment sustainability, quality conscience consumers that are increasing in Africa and across the globe.

With the above, several benefits will accrue to National Standards Regulators (NSRs).

First, they get into a new “standards implementation market” without the risks & costs of developing new standards.

Second, they have an opportunity to sell more of their offerings in one go – rather than being limited by sectorial silos. For example, a producer who uses clean energy to add value means the National Standards Regulator can at a minimum, sell both agriculture and clean energy standards in one go. So, we have one engagement getting the two standards - rather than waiting to have to wait for stand-alone clean energy & agriculture actors to see such progress.

Third NSRs will venture into a new “standards implementation market” without having to incur additional costs of promoting a new standard and developing manuals and training material for stakeholders as they are only maximizing implementing standards that they already have.

Fourth, the economy wide objective of NSRs, which is expanding market opportunities for local producers stand actualized by opening the country’s producers to compete in a market spanning 40 countries.

Fifth, the domestication of this guide implementation logic is in fulfilment of a Ministerial Decision at the 16th session of the African Ministerial Conference on the Environment (AMCEN) to which all member countries have signed to. So NSRs will directly ensure their Governments fulfil their commitments to domesticate a critical AMCEN decision in addition to its other multilateral commitments of the NDCs & SDGs.

This guideline was prepared with technical backstopping of the UN Environment through the Ecosystems Based Adaptation for Food Security Assembly (EBAFOSA) policy – implementation framework.

The Rationale of establishing this guideline is premised on the need to create a market driven incentive to combat climate change by maximizing productivity of catalytic sub-sectors. These are sectors/sub-sectors in which Africa holds a comparative advantage in resources, are economically inclusive and can unlock leading socioeconomic priorities in most countries in the continent – especially achieving food security, creation of income & job opportunities and expansion of macroeconomic growth - simultaneously with enhancing ecosystems and offsetting carbon to meet climate objectives under the Paris Agreement-hence accelerate achieving the Sustainable Development Goals (SDGs) in the continent.

Amalgamating clean energy expansion to power value addition of environmentally sustainably produced agro-products presents a potential catalytic area for Africa targeted by this guideline. The amalgamation is meant to maximize productivity of agriculture by cutting on postharvest losses, losses due to climate change & losses

due to ecosystems degradation. And also maximize productivity of clean energy development by diversifying application beyond traditional domestic use to include productive use in agro-processing and value addition. And in the process, maximize income & job opportunities simultaneously with offsetting carbon & enhancing ecosystems given that clean & sustainable approaches are used. Hence unlock multiple SDGs.

The continent's high-level strategic development vision, the African Union Agenda 2063¹ and high-level AU heads of state decisions on food security & development - the Maputo and Malabo declarations, imply this strategic thrust. They unanimously underscore increased agriculture productivity as critical to inclusive poverty reducing growth to accelerate socioeconomic transformation. But in light of the multiple inefficiencies along Africa's food chains, maximizing productivity cannot be considered as a silo undertaking. Rather, the continent's food systems need to be complemented by amalgamation with key intervening sectors/ sub-sectors accessible to the continent – especially energy, environment & climate resilience, market & supply chains among others to eliminate inefficiencies along the entire agro value chain. This guide aims to inform enforcement of existing standards by respective National Standards Regulators in countries so it can be done in a holistic cascade that benchmarks approaches, technologies & techniques in this strategic amalgamation.

The guideline covers the entire Ecosystems based Adaptation (EBA)-Driven Agriculture production & clean energy powered value addition chain – from upstream on-farm production, where nature based, ecosystems enhancing approaches are used, to mid & downstream processing & other value added actions like linkage to markets where clean energy & carbon offsetting approaches will be employed.

¹ The African Union Commission Agenda 2063 Framework Document. The Africa We Want. A shared strategic framework for inclusive growth and sustainable development & a global strategy to optimize the use of Africa's resources for the benefit of all Africans. September, 2015.

Compliance market incentives for Agro-industrialization — Guideline

1 Scope

This Draft Uganda Standard provides for Quality control of products & processes along the entire EBA-Driven Agriculture & Clean Energy powered value addition chain.

This guideline provides information on the classes of standards to enforce in a cascade towards incentivising the clean energy powered agro-industrialisation. The requirements cover four levels of compliance that include use of nature based EBA approaches for on-farm production (which also covers for organic); use of clean energy for various levels of value addition at both on-farm (e.g. solar powered irrigation) & off-farm; use of Information & Communication Technology (ICT) to effect various linkages to markets & supply chains; services including finance, advisory & compliance.

2 Normative references

The following referenced documents referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 7776, *Information technology -- Telecommunications and information exchange between systems*

US EAS 456, *East African organic products standard*

US ISO 9000, *Quality management systems — Fundamentals and vocabulary*

US ISO 9001, *Quality Management Systems – Requirements*

US ISO 14001, *Environmental Management Standards*

US ISO 14040, *Environmental management — Life cycle assessment — Principles and framework*

US ISO 19011, *Guidelines for Auditing Quality Management Systems*

US ISO 26000, *Guidance on Social Responsibility*

US ISO/IEC 17065, *Conformity assessment -- Requirements for bodies certifying products, processes and services*

US ISO 50001, *Energy management systems – Requirements with guidance for use*

US IEC/TS 62257, *Recommendations for renewable energy and hybrid systems for rural electrification - Part 9-5: Integrated systems - Selection of stand-alone lighting kits for rural electrification*

IEC PAS 62111, *Specifications for the use of renewable energies in rural decentralised electrification*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 audit

a systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which specified requirements are fulfilled

NOTE 1 Internal audits, sometimes called first-party audits, are conducted by, or on behalf of, the organization itself for management review and other internal purposes, and may form the basis for an organization's declaration of conformity. In many cases, particularly in smaller organizations, independence can be demonstrated by the freedom from responsibility for the activity being audited.

NOTE 2 External audits include those generally termed second- and third-party audits. Second-party audits are conducted by parties having an interest in the organization, such as customers, or by other persons on their behalf. Third-party audits are conducted by external, independent auditing organizations, such as those providing certification/registration of conformity to ISO 9001 or ISO 14001.

NOTE 3 When two or more management systems are audited together, this is termed a combined audit.

NOTE 4 When two or more auditing organizations cooperate to audit a single auditee, this is termed a joint audit.

3.2 audit programme

set of one or more audits planned for a specific time frame and directed towards a specific purpose

3.3 audit criteria

set of policies, procedures or requirements

NOTE Audit criteria are used as a reference against which audit evidence is compared.

3.4 audit evidence

records, statements of fact or other information which are relevant to the audit criteria and verifiable

NOTE Audit evidence can be qualitative or quantitative.

3.5 audit findings

results of the evaluation of the collected audit evidence against audit criteria

NOTE Audit findings can indicate either conformity or nonconformity with audit criteria or opportunities for improvement.

3.6 audit conclusion

outcome of an audit provided by the audit team after consideration of the audit objectives and all audit findings

3.7

audit client

organization or person requesting an audit

NOTE The audit client may be the auditee or any other organization that has the regulatory or contractual right to request an audit.

3.8

auditee

organization being audited

3.9

auditor

person with the demonstrated personal attributes and competence (3.1.6 and 3.9.14) to conduct an audit

NOTE The relevant personal attributes for an auditor are described in ISO 19011.

3.10

audit plan

description of the activities and arrangements for an audit

3.11

audit scope

extent and boundaries of an audit

NOTE The audit scope generally includes a description of the physical locations, organizational units, activities and processes, as well as the time period covered.

3.12

audit team

one or more auditors conducting an audit, supported if needed by technical experts

NOTE 1 One auditor of the audit team is appointed as the audit team leader.

NOTE 2 The audit team may include auditors-in-training.

3.13

biodiversity

the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

3.14

certified product

crops and the products produced on a certified farm that complies with applicable standards and policies.

3.15

child labour

any employment that interferes with the legal rights of a child and culturally appropriate educational needs

3.16

Clean energy powered value addition

Any renewable energy technology applied to power value added processes along the entire agro-value chain. From on-farm where solar powered irrigation is prioritized, to off-farm, where various levels are applicable – especially off-grid solar, micro-hydro & wind power plants (5-30Mw rated) for higher order value addition; and solar driers, biogas based cook stoves & other lower order renewable energy options.

3.17

Compliance

Covers stakeholder capacity building & enforcement parameters towards effecting the standard

3.18

conformity assessment

demonstration that specified requirements relating to a product, process, system, person or body are fulfilled

3.19

conservation of ecosystems

the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties

3.20

continual improvement

recurring activity that has the effect of increasing the ability of a group to fulfill specified requirements. The process of establishing objectives and finding opportunities for improvement is a continual process, based on risk assessment, audit findings, management reviews and other means.

3.21

contract

a binding agreement

3.22

discrimination

any distinction, exclusion or preference based on race, color, gender, religion, political opinion, nationality or social origin (or any other motive determined by the afore-mentioned states) that causes equality of opportunity or treatment in employment or work to be lifted or reduced

3.23

Ecosystem Based Adaptation (EBA) Driven Agriculture

any nature based on-farm action that fulfils 3 leading criteria – enhances capacity of ecosystems, builds climate resilience & enhances food security. Leading examples include agro-forestry which enhances soil stability to prevent erosion & enhances ground water recharge; using organic fertilizer to enhance soil organic matter; micro-dosing combining organic fertilizer application with metered use of inorganic fertilizers to replenish specific soil nutrients after conclusive soil tests; efficient micro-irrigation to conserves water among others.

3.24

employee

individual in a relationship recognized as an “employment relationship” in national law or practice

3.25

environment

natural surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, people, outer space and their interrelationships

3.26

erosion

the removal or displacement of soil caused by the movement of water or wind. Severe erosion implies the removal of the entire plow layer or "a" horizon (topsoil) of the soil

3.27

exotic species:

those species not native to the place where they are found. Species introduced from other regions or areas

3.28

farm

the unit subject to certification or the audit

3.29

farmer

for the purpose of this guide, the person or entity that manages a farm or group of farms. It may be a company, an individual farmer, a cooperative or other organization or individual responsible for managing a farm.

3.30

greenhouse gas

gas that contributes to the natural greenhouse effect. The Kyoto protocol covers a basket of six greenhouse gases (GHGs) produced by human activities: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride

3.31

health

Refers to use of non-chemicalized approaches in food production and prioritizing nature based approaches. Also covers conformity to WHO approved scoring on chemical, biological and all other parameters.

3.32

high value ecosystems

natural ecosystems of special importance to environmental conservation, such as habitat that enables the reproduction of endemic and endangered species or hosts viable wild animal or plant populations; provision of ecosystem services such as watershed protection in serious circumstances; or rare ecosystems.

3.33

Information Communication Technology (ICT)

Hardware devices and software technologies & protocols admissible by country standards & telecommunication regulators applicable towards integrating products & services along the entire EBA-based clean energy powered industrialization value chain. Covers mobile apps on smart phones & feature phones; others desktop apps, or a combination of all these.

3.34

inspection

conformity evaluation by observation and judgment accompanied as appropriate by measurement, testing or gauging

3.35

management plan

the collection of documents, reports, records and maps that describe, justify and regulate the activities carried out by any manager, staff or organization within or in relation to the management unit, including statements of objectives and policies

3.36

minimum age

the minimum age for work should not be below the age for finishing compulsory schooling, which is generally 14. Any work which is likely to jeopardize children's physical, mental or moral health, safety or morals should not be done by anyone under the age of 18. Children between the ages of 12 and 14 years old may do light

work, as long as it does not threaten their health and safety, or hinder their education or vocational orientation and training.

3.37

mitigation:

projects or programs intended to offset known impacts to an existing natural resource, human being or community

3.38

life cycle

consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal

3.39

natural resources:

a feature or component of the natural environment that is of value in serving human needs, e.g. soil, water, plant life, wildlife, etc. some natural resources have an economic value (e.g. timber) while others have a "noneconomic" value (e.g. scenic beauty).

3.40

objective evidence

data supporting the existence or verity of something

NOTE Objective evidence may be obtained through observation, measurement, test, or other means.

3.41

operator

an individual or organisation responsible for ensuring that the production system and the products meet the requirements of the respective National standard

3.42

production management unit (PMU)

unit (can be a farm, field, orchard, herd, greenhouse, etc.) defined by the producer for units where segregation of output (agricultural products) is intended and all provisions have been made and put in place to keep separate records and prevent mixing in the case of parallel production.

3.43

precautionary approach

the principle stating that where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation

3.44

Quality

covers conformity to safety, ergonomics, packaging & labelling requirements of products & processes along the entire EBA-based clean energy powered industrialization value chain.

3.45

renewable energy:

energy sources that do not rely on fuels of which there are only finite stocks. the most widely used renewable source is hydroelectric power; other renewable sources are biomass energy, solar energy, tidal energy, wave energy, and wind energy

3.46

slave labour

forced labour

3.47

social and environmental management system (SEMs)

part of an organization's management system used to develop and implement its social and environmental policy and manage its social and environmental aspects

3.48

technical expert

person who provides specific knowledge or expertise to the audit team

NOTE 1 Specific knowledge or expertise relates to the organization, the process or activity to be audited or language or culture.

NOTE 2 A technical expert does not act as an auditor in the audit team.

3.49

test

determination of one or more characteristics according to a procedure

3.50

verification

confirmation, through the provision of objective evidence, that specified requirements have been fulfilled

3.51

worker

person who performs work, whether an employee or someone who is self-employed

3.52

waste

waste is an unwanted or undesired material or substance. It is also referred to as rubbish, trash, garbage, or junk depending upon the type of material and the regional terminology. Most waste is comprised of paper, plastic, metals, glass, food waste, organic material, feces and wood.

3.53

wastewater

any water that has been adversely affected in quality by anthropogenic influence. it comprises liquid waste discharged by domestic residences, commercial properties, industry, and/or agriculture and can encompass a wide range of potential contaminants and concentrations.

4 Guidance clause

4.1 Flexibility / Relevance

This guide is flexible enough to be useful for operators of various sizes, processes, systems, products and countries of operation. In adhering to this guide, the operator shall deal only with those elements that are relevant to the operator's activities.

If certain specific sustainability aspects are considered not relevant to the process, the operator shall justify the specific manner in which its operations do not contribute to the impact of the aspects concerned.

Local circumstances shall be taken into account when assessing the environmental, social or economic situation.

4.2 Stakeholder engagement

Where required in this guide or when a legal right is exercised by a stakeholder in regard to any indicator that affects the stakeholder's welfare, the operator shall document how stakeholders were engaged.

NOTE "Engaged" means both that stakeholders were provided opportunity to comment and that the operator provided a documented response to any grievance presented by stakeholders.

4.3 Undue administrative burden

The capacity and resources of the operator should be taken into account so that this guide does not cause excessive administrative burden.

4.4 Management plan

When referenced as an indicator in this guide, management plans are intended to be a flexible mechanism for the operator to use to establish reasonable and appropriate plans to address relevant sustainability aspects. A plan that does not include all elements listed in the definition of a management plan is not considered a management plan for the purpose of this guide. The form of a management plan is not specified; a plan may be comprised of disparate or consolidated proprietary documents, reference materials and/or demonstrated knowledge and/or practice. Monitored data generated in accordance with the plan should be accessible to the verifier to facilitate his or her assessment and to ensure that the definition of a management plan has been adhered to. The data itself would not be attached to or incorporated into the verifier's conformity assessment.

5 General requirements

5.1 Responsibility

An operator shall be responsible for only its own operations in applying this guide. Its own operations are defined as the sum of activities conducted by the operator throughout the supply chain, including those contracted activities conducted by its subcontractors.

5.2 Transparency

The data, information sources and assumptions used shall be communicated in a clear, accurate, timely, honest and complete manner (ISO 26000).

5.3 Legality

The operator shall be in compliance with all applicable laws and regulations having direct relevance to the principles, criteria and indicators presented in this guide. An operator may document instances where it is prohibited from complying with this guide as a consequence of a conflicting applicable law or regulation.

5.4 Science-based approach

Any data collected or used in the application of this guide, as well as justifications, presentations, commentary, or interpretation of results associated with the use of this guide, shall be based on science, experience and technology.

5.5 Human rights

This guide strives to ensure that the actions of the operators and their subcontractors respect the human rights of all citizenry, especially those of local stakeholders.

The operators shall respect universally recognized human rights.

5.6 Working conditions

The operator shall respect labour rights and provide safe and healthy working conditions, including providing tools, equipment and training that address the risk of workplace hazards.

6 Principles, criteria and indicators

6.1 Climate / Environmental compliance

Criterion: Actors along the agro-led industrialization chain shall engage in processes that offset carbon and conserve ecosystems to ensure climate resilience is built. These actions shall conform to relevant internationally recognized standards (ISO) and National Standards covering products & processes along the entire EBA-based clean energy powered industrialization value chain.

Specifically this criteria covers:

- a) Ecosystems conserving, enhancing and restoring approaches / Ecosystems Based Adaptation (EBA) approaches for on-farm production (expounded in-text); and
- b) Carbon offsetting, resource conserving value addition approaches in the post farm gate value chain & production processes centered around use of clean energy based, resource conserving processing and other value addition activities (among these clean energy powered drying / preservation; clean transport; green warehousing; bio-degradable packaging; use of recycled / re-used material for packaging etc.) & ICT based market & supply chain linkages (in place of paper processes & physical travelling that have a much bigger carbon print).

6.1.1 Ecosystems Based Adaptation Component Criteria

Summary: The primary criterion is that approaches must be nature based and fulfill 3 key aspects - Enhance food & nutritional security, build climate resilience / adaptation and enhance ecosystems productivity. Examples includes use of indigenous resilient crops; micro-dosing (metered application of mineral fertilizer to address specific deficiencies alongside organic manure); integrated soil fertility management; conservation agriculture approaches; water efficient irrigation, ecosystems restoration activities e.g. agro-forestry to enhance ground water re-charge, water recycling/reclamation, water harvesting, minimizing erosion, enhancing biodiversity, enhancing quality of pollinators.

(Specific applicable criteria based on respective country context)

6.1.1.1 Maintenance of biodiversity

Principle: To maintain and/or enhance biodiversity and supporting habitats within the farming system and its surroundings.

6.1.1.1.1 Protection and conservation of biodiversity

Criterion: The operator shall identify, support, protect and maintain the integrity of terrestrial, wetland and aquatic ecosystems inside and outside of the farm and promote ecologically functional habitats and species, and shall not permit their destruction or alteration as a result of management or production activities on the farm.

Indicators

6.1.1.1.1.1 The operator addresses biodiversity within the farm plan to assess current ecosystems and identify appropriate habitat management practices, and encouraging participation in existing conservation programs and watershed ecosystem protection efforts to support diverse species and habitats.

6.1.1.1.1.2 The status of rare, threatened or endangered species that exist in the area of operations or that could be affected by operations are identified, recorded and their conservation taken into account in management plans and operations.

6.1.1.1.1.3 Primary ecosystems, such as primary forests and wetlands, shall not be cleared or drained for the purpose of establishing production, processing or trading operations.

6.1.1.1.1.4 To the extent possible and appropriate to the crop and the conditions, trees cover shall be enhanced in and/or around the fields in addition to activities aimed at restoration of natural ecosystems within the farm.

NOTE 1 Older, fruiting trees are especially important to insects and birds. Natural boundaries such as hedges, paths and ditches should be encouraged. Legume trees will complement agricultural production.

NOTE 2 Hedges, paths and ditches act as important wildlife corridors through agricultural land, help to maintain a diverse ecology, connectivity and provide a habitat for many beneficial animals and lower plants.

6.1.1.1.1.5 Intentional burning of vegetation shall be prohibited and alternative methods adopted for utilization of vegetation thereby protecting organic matter and biodiversity for enhanced productivity.

6.1.1.1.1.6 Appropriate measures (such as but not limited to mulching, composting, crop rotation, intercropping, agro-forestry) shall be undertaken to stimulate and enhance plant production, organic matter, soil fertility, microbial activity, soil and plant health.

6.1.1.1.1.7 For perennial crops, intercropping may be undertaken for crops whose husbandry practices do not lead to risks on food safety. For perennial crops that are grown as monocultures where intercropping is not possible (e.g., sugarcane and tea), other means to secure biodiversity shall be applied to the growing system.

6.1.1.1.1.8 For any new plant introduction, the operator shall undertake a risk assessment on ecological suitability and the impacts the new species will have on the ecosystem.

6.1.1.1.1.9 Hunting, capturing, extracting and trafficking wild animals shall be prohibited on the farm. Cultural or ethnic groups are allowed to hunt or collect fauna in a controlled manner and in areas designated for those purposes under the following conditions:

- a) The activities do not involve species in danger of or threatened with extinction;
- b) There are established laws that recognize the rights of these groups to hunt or collect wildlife;

- c) Hunting and collection activities do not have negative impacts on the ecological processes or functions important for agricultural and local ecosystem sustainability. The long-term viability of the species' populations is not affected; and
- d) These activities are not for commercial purposes.

6.1.1.1.1.10 Timing harvest and other mechanical activities, within the window of opportunity, to minimize impacts on wildlife, habitat, and/or ecosystem functions, especially during critical reproduction and migratory periods.

6.1.1.1.2 Protection of areas of high biodiversity value

Criterion: There shall be no economic production in areas designated as conservation areas according to national law and regulations and international conventions except when a specific form of use is stated to serve the biodiversity protection purpose in official documentation and/or approved management plans.

Indicators

6.1.1.1.2.1 The operator provides objective evidence demonstrating that they have identified the status of the area and the conservation values of global, regional or local importance affected by the potential or existing operation(s) of the operator.

6.1.1.1.2.2 The objective evidence provided by the operator on the identification of conservation values includes:

- a) The area (ha), quantity, and mapped location of production in the biodiversity protection area;
- b) Evidence of consultation (e.g. meeting records) with relevant national/regional experts and institutions to identify conservation values of global, regional or local importance;
- c) Evidence of consultation with local stakeholders to conservation values of global, regional or local importance;
- d) For new projects, site level mapping, including delineation of areas to be planted and areas to be set aside for conservation values of global, regional or local importance;
- e) For existing projects, site level mapping, including delineation of areas to be maintained or restored for conservation values of global, regional or local importance;
- f) Comprehensive description of conservation values of global, regional or local importance related to the area;
- g) Comprehensive description of the possible impacts of the bioenergy operation(s) on conservation values of global, regional or local importance;
- h) Comprehensive description of the possible risks resulting from the bioenergy operation(s) to conservation values of global, regional or local importance; and
- i) Comprehensive description of the precautionary measures and practices identified and implemented to ensure that the conservation values of global, regional or local importance relating to and/or affected by the potential or existing operation(s) of the operator (i.e. including consideration of the wider landscape context) are maintained or enhanced.

6.1.1.1.2.3 Existence of a biodiversity management plan (as proof of compliance)

6.1.1.1.2.4 Evidence that no area defined as “no conversion area” was used unless documented evidences are provided that operations maintain their status and maintain or enhance their identified conservation values.

6.1.1.1.2.5 Evidence that the proposed or existing operation(s) can be/are managed in ways which maintain or enhance any conservation values of global, regional or local importance identified during the screening exercise.

6.1.1.1.2.6 Evidence that precautionary measures and implemented practices have been effective in maintaining or enhancing conservation values of global, regional or local importance.

NOTE The mitigation measures to be covered in the ESMP include but are not limited to sustainable harvesting of the biomass existing on the site (e.g. thinning, mowing), protection measures for biodiversity values, the creation of conservation set side zones, buffer zones, multiple use zones, controls on access and product removals, and specifically the ban on hunting, fishing, ensnaring, poisoning and exploitation of rare, threatened, endangered and legally protected species.

6.1.1.1.2.7 Evidence that precautionary measures have been effective in giving preference to operating in areas which pose the lowest risk to conservation values of global, regional or local importance.

6.1.1.1.2.8 Evidence that a written summary listing of the conservation values of global, regional or local importance is publicly available.

6.1.1.1.2.9 Evidence that none of the operation(s) have taken place or are planned within any of the areas defined as “no-go areas” or Alliance for Zero Extinction (AZE) area.

6.1.1.1.2.10 Evidence that no hunting, fishing, ensnaring, poisoning and exploitation of rare, threatened, endangered and legally protected species is on-going on in the operations site.

6.1.1.1.3 Biodiversity values within the area of production

Criterion: Biodiversity values shall be promoted within the area of production and the nearby environment that can be directly influenced by the operator.

Indicators

6.1.1.1.3.1 The operator has developed and implemented a biodiversity management plan.

6.1.1.1.3.2 The operator's biodiversity management plan encompasses fragmentation of habitat.

6.1.1.1.3.3 The operator's biodiversity management plan encompasses the mapped area (ha) of protected or restored ecological corridors, the buffer zones and the set-aside areas in the bioenergy production site and the percentage of the bioenergy production site that is set aside for biodiversity protection.

6.1.1.1.3.4 Evidence of implementation of appropriate crop management practices to assist conservation of rare, threatened, endangered or important vulnerable ecosystems species of local, regional, or global importance, where present including:

- a) Appropriate timing of field operations to avoid harm to listed species, e.g. field operations timed to avoid disturbance to nesting and fledging birds;
- b) Use of fertilizers, pesticides, herbicides and fungicides considers impact on listed species; and
- c) Limited and appropriate use of burning of crop residues.

6.1.1.1.3.5 The presence of important habitats and species is periodically assessed and the status of rare, threatened or endangered species or habitats of high conservation value is documented.

6.1.1.1.3.6 Appropriate conservation measures are included in the biodiversity management plan to protect rare, threatened or endangered species and habitats of high conservation value within production area to include:

- a) retention of riparian and wetland habitats;
- b) retention protection of veteran trees; and
- c) no-spray and no-burn areas within 10 m of areas of high conservation value.

6.1.1.1.3.7 Evidence of additional conservation measures to encourage wildlife and restore degraded natural ecosystems including:

- a) Restoration of degraded natural habitats within 50 m of production areas; and
- b) Use of biological controls in crop management.

6.1.1.1.4 Ecosystem functions and services within the area of production

Criterion: The ecosystem functions and services within the area of production shall be maintained or enhanced at the landscape level.

Indicators

6.1.1.1.4.1 Where a project is likely to adversely impact ecosystem services, evidence that the operator conducts a systematic review to identify priority ecosystem services, i.e.: (i) those services on which project operations are most likely to have an impact and, therefore, which result in adverse impacts to Affected Communities; and/or (ii) those services on which the project is directly dependent for its operations (e.g., water).

6.1.1.1.4.2 Evidence of reasonable effort to avoid adverse impacts on priority ecosystem services of relevance to Affected Communities and where these impacts are unavoidable, the operator minimizes them and implements mitigation measures that aim to maintain the value and functionality of priority services.

6.1.1.1.4.3 With respect to impacts on priority ecosystem services on which the project depends, evidence that operators minimize impacts on ecosystem services and implement measures that increase resource efficiency of their operations.

6.1.1.1.4.4 Evidence that Affected Communities likely to be impacted participate in the determination of priority ecosystem services in accordance with the stakeholder engagement process.

6.1.1.1.4.5 If evidence exists that the operation will directly affect ecosystem functions and services, the operator provides objective evidence demonstrating that there is in place a biodiversity management plan to ensure that the operation(s) effectively maintains or enhances the ecosystem functions and services identified both inside, and outside the production site(s).

NOTE The management practices in the Environmental and Social Management Plan (ESMP) may include:

- a) For ecosystem functions: the creation or maintenance and protection of areas where natural regeneration processes are allowed to take place, and where populations of native plants and animals can breed, feed and find refuge.

b) For ecosystem services:

- i. Actions to control and minimize disturbance to water quality and water flows e.g. the creation or protection of riparian buffer zones of natural vegetation, to help control physical events such as floods or the spread of diseases, and the maintenance of natural vegetation in important water catchments, especially steep slopes;
- ii. Actions to control and minimize soil disturbance, erosion and compaction including the avoidance of land clearance on sensitive or highly erodible soils, especially on steep slopes, and positive soil restoration measures where appropriate;
- iii. Actions to minimize the risk of fire and the effects of wind erosion e.g. maintenance of appropriate natural barriers; and
- iv. Protection and maintenance of areas of natural vegetation where local populations can maintain a sustainable harvest of those natural goods e.g. Non Timber Forest Products (NTFPs) which have been identified as important to their livelihoods.

6.1.1.1.4.6 The operator provides objective evidence demonstrating that continuous monitoring and measures implemented through their ESMP to maintain and enhance ecosystem functions and services are effective.

6.1.1.1.5 Buffer zones

Criterion: operators shall protect, restore or create buffer zones.

Indicators

6.1.1.1.5.1 The operator provides objective evidence demonstrating that buffer zones are protected, restored or created within the site(s) of her/his/its bioenergy operation(s) around areas with conservation values of local, regional or global importance.

6.1.1.1.5.2 The operator provides objective evidence demonstrating that buffer zones are effective in mitigating potential negative impacts of the operations on areas that are contiguous to the operation site and, within the operation site, on any area containing conservation value(s) of local, regional or global importance.

6.1.1.1.5.3 The operator provides objective evidence demonstrating that buffer zones remain unused for economic operation(s).

NOTE Buffer Zones may be managed in order to contribute to the sustained supply of environmental goods and services, in line with their protective function.

6.1.1.1.6 Ecological corridors

Criterion: Ecological corridors shall be protected, restored or created to minimize fragmentation of habitats.

Indicators

6.1.1.1.6.1 The operator provides objective evidence demonstrating that ecological corridors within the production site(s) have been identified.

6.1.1.1.6.2 Evidence demonstrating that existing ecological corridors within the production site(s) are set-aside and protected with appropriate buffer zones.

6.1.1.1.6.3 Evidence demonstrating that, where there is the risk that operation(s) could increase the fragmentation of surrounding ecosystems, the spatial layout of the operation(s) is adjusted to not cause any additional fragmentation and to maintain connectivity of ecosystems through the creation of ecological corridors within the operation(s).

6.1.1.1.6.4 Evidence that specific measures are implemented to establish ecological corridors that facilitate the movement of wildlife in areas surrounding the site(s) of operation(s).

6.1.1.1.6.5 Indicator: New ecological corridors are created within the operation site if it is surrounded by areas containing wildlife and there is evidence that such corridors would improve connectivity.

6.1.1.1.6.6 Indicator: Ecological corridors, which were destroyed and for which the operator is directly accountable, have been restored effectively.

6.1.1.1.6.7 Indicator: Ecological corridor(s) are effective in protecting, maintaining and/or enhancing the environmental aspect for which they were established.

6.1.1.1.7 Invasive alien species

Criterion: operators shall prevent invasive species from invading areas outside the operation site.

Indicators

6.1.1.1.7.1 The operator complies with applicable laws and regulations regarding the cultivation, handling and use of genetically modified organisms, non-native crops and nationally recognised alien and invasive species or which has been analysed or recorded (e.g. in the Global Invasive Species Database) (even if not prohibited in the country of operation) as highly invasive under similar conditions (climate, local ecosystems, soil types, etc.). In the absence of national law, compliance with requirements from a relevant national authority

6.1.1.1.7.2 The operator provides objective evidence demonstrating that a Weed Risk Assessment has been undertaken analysing each species cultivated, used, or otherwise handled in the operation(s) of the operator to identify the potential threat of invasion.

6.1.1.1.7.3 The operator provides objective evidence demonstrating that the species used in the operation(s) have no or low risk of invasion in similar conditions.

6.1.1.1.7.4 If no evidence exists demonstrating that the species used have no or low risk of invasion in similar conditions, the operator provides objective evidence demonstrating implementation of applicable international or government approved guidelines that exist in the country or region of the operation(s).

6.1.1.1.7.5 The operator provides objective evidence demonstrating that specific measures are implemented which prevent and mitigate the risk of invasion during cultivation, harvesting, processing, transport and trade by among other things containing propagules in an appropriate manner.

6.1.1.1.7.6 The operator provides objective evidence demonstrating that continuous monitoring is undertaken to detect any invasion outside the operation site, of species cultivated, used or otherwise handled by the bioenergy operation(s).

6.1.1.1.7.7 Evidence that the operator has established a management plan, which includes cultivation practices that minimize the risks of invasion, immediate mitigation actions (eradication, containment or management) in case of escape of a plant species outside the operation site (possibly through the provision of a specific fund), as well as a monitoring system that checks for escapes and the presence of pests and pathogens outside the operation site.

6.1.1.1.7.8 Rare, threatened or vulnerable ecosystems and species are protected)

6.1.1.1.7.9 Optimize the use, handling, storage and disposal of fertilizers, herbicides, pesticides, fuels and other chemicals from an environmental perspective.

6.1.1.1.7.10 Evaluation of consequences of non-native crops.

6.1.1.1.7.11 Evidence of the adoption of safeguards to avoid potential risks associated with the use of GMO and alien species.

6.1.1.2 Soil management

Principle: To maintain and replenish long-term soil health, fertility and productivity.

6.1.1.2.1 Soil management plan

Criterion: A soil management plan, which aims to maintain and protect soil health, quality and productivity and reverse soil degradation, shall be developed and implemented.

Indicators

6.1.1.2.1.1 The operator has developed a soil management plan, or has implemented a soil management plan approved by a local authority, with applicable abatement measures; and ongoing status is monitored at appropriate intervals.

6.1.1.2.1.2 The operator has provided measures of the quality and productivity of soils at the site and local level, including those for salinization, compaction, contamination, water holding capacity and retention of organic carbon content.

6.1.1.2.1.3 The operator provides evidence that the use of agrarian and forestry residual products, including lignocellulose material, is not at the expense of long-term soil stability and organic matter content.

6.1.1.2.1.4 The operator provides evidence of implementing measures to improve soil health, such as Conservation Agriculture practices as defined by the FAO, including:

- a) Organic direct planting;
- b) Permanent soil cover;
- c) Crop rotation; or
- d) Fallow areas with natural or planted vegetation in order to recover natural fertility and interrupt pest life cycles.

6.1.1.2.1.5 The operator provides objective evidence demonstrating that the Soil Management Plan is based on continuous monitoring (e.g. at minimum once per season and once per crop rotation, etc.) of physical, chemical, organic and biological properties of the soils and other related factors (e.g. rainfall, water availability, run-off and other conditions, climatic conditions, size and layout of the production area, etc.) in and around the production area of the operation(s) of the operator, as collected through the impact assessment studies or other equivalent source.

6.1.1.2.2 Soil erosion

Criterion: Practices that minimize and control erosion and degradation of soils shall be used.

Indicators

- 6.1.1.2.2.1** Evidence of maps indicating areas of fragile soils
- 6.1.1.2.2.2** The operator has identified local soil erosion forces (rainfall, runoff and/or wind) and all parameters of agronomic (soil erodibility, etc.), physical/topological (e.g., field slope) and/or climatic conditions that affect soil loss.
- 6.1.1.2.2.3** Indicator: The operator's soil management plan encompasses engineering and technical measures to address soil loss.
- 6.1.1.2.2.4** The operator provides objective evidence demonstrating implementation of practices to reduce or avoid soil erosion and compaction, and to maintain or improve soil organic matter.
- 6.1.1.2.2.5** Mitigation measures are in place
- 6.1.1.2.2.6** Tillage practises (season/no/low/high)
- 6.1.1.2.2.7** A management strategy should exist for plantings on slopes above a certain limit (needs to be soil and climate specific).
- 6.1.1.2.2.8** A management strategy should be in place for other fragile and problem soils (e.g. sandy, low organic matter, acid sulfate soils)
- 6.1.1.2.2.9** Presence of road maintenance programme.
- 6.1.1.2.2.10** Subsidence of peat soils should be minimised under an effective and documented water management programme.
- 6.1.1.2.2.11** Buffer zones/strips
- 6.1.1.2.2.12** Water channels
- 6.1.1.2.2.13** Monitoring data
- 6.1.1.2.2.14** Percent of arable land in production
- 6.1.1.2.2.15** Tons of soil lost/hectare/year in arable land cultivated for feedstock production

NOTE 1 Techniques that minimize soil erosion may include practices such as ground cover management, biomass recycling, terracing, and natural regeneration or restoration instead of replanting.

NOTE 2 For existing plantings on peat, water table should be maintained at a mean of 60cm (within a range of 50-75cm) below ground surface through a network of appropriate water control structures e.g. weirs, sandbags, etc. in fields, and watergates at the discharge points of main drains.

NOTE 3 Smallholders should be able to demonstrate that they have an understanding of the techniques required to manage their soils and that they are being implemented.

NOTE 4 National interpretation should refer to national guidance, and identify the best management practices and appropriate techniques for maintaining soil quality in local conditions, including guidance on soil types, and any appropriate performance thresholds, such as maximum acceptable slope gradient for planting.

6.1.1.2.3 Soil productivity and fertility

Criterion: Soil productivity and fertility shall be maintained or improved with due regard for soil structure and stability, organic matter and nutrient content.

Indicators

- 6.1.1.2.3.1 Productivity issues are specified in the soil management plan.
- 6.1.1.2.3.2 Evidence that the soil management plan reviews erosion risk, sets out a strategy for protecting high-risk areas, and assesses soil structure to identify impediments to rooting and crop water use.
- 6.1.1.2.3.3 Rotation period with an integrated plant nutrition approach and soil nutrient compensation (indicator)
- 6.1.1.2.3.4 Analysis of topsoil nutrient status at 5 yearly intervals following recommended sampling and analysis methods. Should include P, K, N and pH status
- 6.1.1.2.3.5 Use of a farm nutrient management plan, which details fertilizer and manure management principles – including no spread zones (to protect water bodies), soil nutrient status, crop requirements and inputs of nutrients in manure.
- 6.1.1.2.3.6 Evidence of checks on fertilizer spreaders to ensure evenness of spread, within acceptable limits.
- 6.1.1.2.3.7 Proportion of biomass harvested
- 6.1.1.2.3.8 Compensatory measures for soil carbon losses
- 6.1.1.2.3.9 Productivity over time
- 6.1.1.2.3.10 Monitoring data
- 6.1.1.2.3.11 Evidence of following recommendations of the agro-ecological zoning
- 6.1.1.2.3.12 Changes in productivity on arable land.

6.1.1.2.4 Soil physical status

Criterion: Soil physical status shall be maintained.

Indicators

- 6.1.1.2.4.1 Physical status issues are specified in the soil management plan.
- 6.1.1.2.4.2 Where the Soil Impact Assessment demonstrated that the soil conditions were already optimal, the operator provides objective evidence demonstrating that implementation of Soil Management Plan effectively prevents (and if necessary mitigates) alteration of physical, chemical and/or biological soil properties including soil organic matter. Where the Soil Impact Assessment demonstrated that the soil conditions were below optimal, the operator provides objective evidence demonstrating that implementation of Soil Management Plan effectively reverts soil degradation and restores physical, chemical and/or biological soil properties to optimal levels.
- 6.1.1.2.4.3 Tillage practices (season/no/low/high).

6.1.1.2.4.4 Equipment and technique used.

6.1.1.2.4.5 Soil characteristics

6.1.1.2.4.6 Monitoring data.

6.1.1.2.5 Soil chemical and biological status

Criterion: Soil chemical and biological status shall be maintained.

Indicators

6.1.1.2.5.1 Optimize the use, handling, storage and disposal of fertilizers, herbicides, pesticides, fuels and other chemicals from an environmental perspective.

6.1.1.2.5.2 The management system is based on an integrated system of pest control.

6.1.1.2.5.3 The use of restricted pesticides is controlled and administration is kept up to date. Stock is kept in a separate and locked storage.

6.1.1.2.5.4 Biological control agents and organic pesticides, as well as traditional knowledge and skills regarding alternatively non-chemical pest control have to be identified and implemented in the agricultural management system.

6.1.1.2.6 Land conservation and rehabilitation

Criterion: The agriculture management shall be aimed at land conservation and rehabilitation.

Indicators

6.1.1.2.6.1 Land degradation is surveyed on a regular basis.

6.1.1.2.6.2 Land and conservation areas at risk are identified and the policy and management measures are formulated.

6.1.1.2.6.3 The general planning, management and utilization of land resources and the preservation of soil fertility are defined and executed.

6.1.2 Clean Energy Powered Value Addition Criteria

The criteria for technologies, techniques and processes specified by countries must promote diverse clean, renewable technologies and increase renewable energy generation in the country. But all must be dedicated to clean energy power for productive use in powering various levels of agro-value addition. Be it on-farm, where the main key focus is solar powered micro-irrigation and off-farm / post farm gate where focus covers low level value addition like solar drying, biogas for value addition in eateries etc., to higher order value addition where focus is on decentralized / off-grid plants that can provide 5 - 30Mw of off-grid electricity to power an ecosystem of processing factories e.g. a solar powered processing & packaging factory etc. For electrification, it is envisaged that off-grid technologies, processes & techniques will be fostered drawing from the fact that they represent the most economical mode of electrification for remote & rural low load areas where most agriculture occurs & where agro-value addition can occur in proximal distance to raw material sources.

6.1.2.1 Applicable clean energy technologies

Solar, Wind, Micro-hydro, Bio-energy; solar powered irrigation systems.

Above technologies must satisfy relevant National Standards Regulators code of practice and International standards including normative references under part 2 and Annexes 1 & 2. This covers both on-farm & off-farm value addition; low level cottage industry to higher order processing factories.

6.1.2.2 Applicable project design specification

Relevant design specifications for energy systems applicable for both on-farm & off-farm value addition shall satisfy relevant National Standards Regulators code of practice and International standards including normative references under part 2 and Annexes 1 & 2. This covers both on-farm & off-farm value addition; low level cottage industry to higher order processing factories.

6.1.2.3 Applicable equipment technical specifications

Equipment used to develop energy systems for both on-farm & off-farm value addition shall satisfy relevant National Standards Regulators code of practice and International standards including normative references under part 2 and Annexes 1, 2 & 3. This covers both on-farm & off-farm value addition; low level cottage industry to higher order processing factories.

6.1.2.4 Applicable energy efficiency criteria

Energy systems, both on-farm & off-farm value addition systems shall conform to relevant efficiency requirements as specified in National Standards Regulators code of practice and International standards including normative references under part 2 and Annexes 1, 2 & 3. This covers low level cottage industry to higher order processing factories.

6.1.2.5 Applicable service & equipment procurement standards

Procurement of technical services & technologies for both on-farm & off-farm value addition energy systems shall conform to relevant National Standards Regulators code of practice and International standards including normative references under part 2 and Annexes 1, 2 & 3. This covers low level cottage industry to higher order processing factories.

6.1.2.6 Applicable tools

Tools used to develop energy systems for both on-farm & off-farm value addition shall satisfy relevant National Standards Regulators code of practice and International standards including normative references under part 2 and Annexes 1, 2 & 3. This covers both on-farm & off-farm value addition; low level cottage industry to higher order processing factories.

Site selection procedures: location of agro-industrial zones, the primary areas where the clean energy systems will be set up shall factor need to locate processing & value addition in proximal distance to sources of raw material. Hence maximize revenues (by minimizing costs) & emissions associated with transporting bulky, low value raw material to distant locations for value addition.

6.1.2.7 Construction & commissioning procedures

Shall satisfy relevant National Standards Regulators code of practice and International standards including normative references under part 2 and Annexes 1, 2 & 3. This covers both on-farm & off-farm value addition; low level cottage industry to higher order processing factories.

6.1.2.8 Operation & maintenance procedures

Shall satisfy relevant National Standards Regulators code of practice and International standards including normative references under part 2 and Annexes 1, 2 & 3. This covers both on-farm & off-farm value addition; low level cottage industry to higher order processing factories.

6.1.2.9 Decommission, salvage & disposal at end of useful life

Shall satisfy relevant National Standards Regulators code of practice and International standards including normative references under part 2 and Annexes 1, 2 & 3. This covers both on-farm & off-farm value addition; low level cottage industry to higher order processing factories.

6.1.2.10 Energy efficiency

The operator shall determine and document the energy demand by the enterprise for developing an energy efficiency plan with goals and implementation activities towards increased efficiency, reduced dependency on non-renewable sources and increased use of renewable energy.

Records shall be maintained on all aspects of energy management

In all the above actions, relevant National Standards Regulators code of practice and International standards including normative references under part 2 and Annexes 1 & 2 shall apply. This covers both on-farm & off-farm value addition; low level cottage industry to higher order processing factories.

6.1.2.11 Other auxiliary requirements

- a) Interoperability of different component parts and products from different manufacturers should be fostered
- b) Durability: Products / Projects should be appropriately protected from water exposure, have durable switches and connectors and, if portable, survive being dropped.
- c) System Quality: Product / Projects should pass a visual wiring and assembly inspection.
- d) Warranty: Components should have a consumer-facing warranty
- e) End-to-end project scenario requirements as per IEC standard - Engineering, procurement and construction. This part provides a systematic breakdown of the end-to-end steps & conformity requirements to fulfil in a full project scenario. The IEC standard, a normative reference within this guide is used for illustration.

6.1.2.12 Engineering

Engineering activities which include but not limited to general presentation of electrification systems, network configuration, functional diagrams and subsystems should be done with the guidance of IEC TS 622257-2 and 4 in addition to national codes and regulations. Specialist competencies will be required as many designs will require non-traditional engineering solutions.

6.1.2.13 Procurement requirements

6.1.2.13.1 Selection of supplier or service provider

The requirements for the selection of supplier or service provider should be in compliance with national regulations related to the procurements process. In addition to the national regulation, the guidance specified in IEC TS 62257-3 should be considered during the selection of supplier or service provider. For stand-alone lighting kits, the guidance given in IEC TS 62257-9-5 should be taken into consideration.

6.1.2.13.2 Pricing requirement

Value for money should be the key factor in pricing and should be in accordance with the national procurement requirements. Relevant incentives should be considered where applicable.

6.1.2.13.3 Qualitative and quantitative assessment requirements

The qualitative and quantitative assessment should be done with guidance given in IEC TS 62257-3 and considering IEC International standards or national standards on specific equipment or product to be used in the project.

6.1.2.14 Construction

6.1.2.14.1 Standards, grid codes and regulations

The construction of rural electrification system should be done in accordance with relevant national standards, grid codes and regulations where applicable. In cases where it is not applicable, the IEC standards and regional standards should be considered. The guidance given in IEC TS 62257-3 on use of standards in rural electrification system should be considered during the construction of rural electrification systems project. The project design should provide all documentation to the project owner.

6.1.2.14.2 Access facilities

All rural electrification projects should have the access facilities to enhance implementation and maintenance.

6.1.2.14.3 Communication facilities

Appropriate communication facilities for engaging relevant stakeholders at all stages should be considered.

6.1.2.14.4 Plant construction

Plant construction should be done with the guidance given in IEC TS 62257-7 and 9. The test certificate for the equipment should be available on the construction site for inspection purposes. The as-built diagram should be available for ease of maintenance. The specifications given in IEC TS 62257-5 must be taken into account for the electric power distribution lines.

6.1.2.14.5 Transmission and distribution lines construction

The construction of transmission and distribution lines should be done in compliance with IEC standards or guide and/or national codes and standards where applicable. Test certificate shall be available at any time are requested for inspection and the as-built schematic diagram shall be available for ease of maintenance. The guidance given in IEC TS 62257-5 should be taken into consideration for distribution lines.

6.1.2.14.6 User interface requirements

The guidance given in IEC TS 62257-9-3 should be taken into account during design and construction for user interface. This guidance specifies the general requirements for the design and implementation of interface equipment within the user's installations which connect to micro-grid or standalone systems.

6.1.2.14.7 User installation requirements

The guidance given in IEC TS 62254-9-4 should be used during the design and construction of user installation to ensure protection of persons, animals and equipment as well as satisfactory operation in accordance with purpose for which the installations are designed.

6.1.2.14.8 Commissioning and acceptance

The commissioning and acceptance procedures should be in compliance with IEC TS 62257-6. For stand-alone lighting kits, the guidance given in IEC TS 62257-9-5 should be taken into consideration.

6.1.2.15 Operation and maintenance

The operation and maintenance shall be done by certified and authorized technician. The relevant applicable guides/manuals should be used for operation and maintenance.

6.1.2.15.1 Preventive and operational maintenance requirements

The maintenance requirements should be established in accordance with guidance given in IEC TS 62257-6. The projector implementer should have the maintenance plan.

6.1.2.15.2 Capacity building requirements

The project developer shall provide to the project owner/implementer the documentation related to the capacity building training for the user and implementers of the project. The training plan should be done in accordance with guidance given in IEC TS 62257-6.

6.1.2.15.3 Roles and responsibilities of consumers, local government, utilities and regulatory authority

Different stakeholder roles shall be defined by the project developer and shall be submitted to the project owner during commissioning. The roles should be defined in accordance with guidance given in IEC TS 62257-3 and 5 as well as local regulations.

6.1.2.15.4 Conformity assessments

Conformity assessment systems, notably IECCE and IECRE (www.iec.ch) may be applicable to specific subsystems, equipment and should be used to give assurance of compliance to standards wherever practicable. Implementers of projects should enquire with the National Standards Body (NSB), or national committee member of IEC, if applicable, to establish whether these conformity assessment systems are supported in the country where the project is being implemented. NOTE At an individual national level, other conformity assessment requirements might apply to certain equipment and could be enforceable through regulations. Where applicable, compliance should be verified as specified in IEC TS 62257-13.

6.1.3 Low Carbon Market & Supply Chain linkage requirements

6.1.3.1 Use ICT to link efficiently to market & supply chains of inputs, advisory, finance, standards enforcement (in place of physical travelling & paper processes which have a much bigger carbon print / use more resources & result in higher emissions)

- a) Relevant country ICT tools from EBAFOSA stakeholders to be used to effect above value chain linkages
- b) Exposure level of ICT equipment must conform to International standards prescribed by the International Telecommunications Union (ITU) - Recommendation ITU-T K.52 (compliance of telecommunication installations and mobile handsets or other radiating devices used against the head with safety limits for human exposure to electromagnetic fields)
- c) Devices – mobile phones, tablets, laptops & desktop computers to be energy efficient – conform to ISO/IEC JTC 1/SC 39, Sustainability for and by information technology Standards key to reducing energy consumption
- d) Interoperability of devices from different manufacturers – conformity to ISO/IEC 7776

6.1.3.2 Transport, infrastructure planning should prioritize the shortest, most efficient means to transport produce to markets e.g. prioritizing good quality roads linking production areas to markets & collection points

- a) Relevant planning, design & construction parameters shall comply with specifications in relevant National codes of practice
- b) Improved emissions standards on transport vehicles and other logistical carriages. Transport emissions improvement standards in relevant National codes of practice to apply.

6.1.3.3 Packaging using bio-degradable material.

- a) Choice of material to be based on relevance, availability and applicable National codes of practice

6.2 Organic & Health Compliance

Specification / criteria specified by the country must be based on use of non-chemicalized approaches for food production and prioritize only nature-based approaches. The Organic Standard requirements and available & applicable organic standards in the country shall be adopted as part of compliance with this parameter.

6.2.1 Food crops

- a) Seed production follows natural approaches
- b) Specific seed quality parameters specified by National Standards Regulators
- c) Organic manure prioritized
- d) Application of (inorganic) fertilizer must be informed by conclusive soil tests & analysis
- e) Soil test parameters & equipment established by respective National standards bodies shall apply
- f) Prioritize use non-chemical techniques (biological & mechanical) to combat pests & diseases.

6.2.2 Fisheries, poultry & Livestock products

Feed given to livestock, poultry & fish must be nature based. Any necessary treatment involving use of chemicals must use those certified by National Standards Regulators. Animal products must not be consumed in the treatment period.

6.2.3 Auxiliary requirements

Relevant requirements specified in the “environmental compliance section” under the EBA component as well as normative references specified in this guide shall apply.

6.2.4 Pesticide use and management

Principle: To promote the use of environmentally friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides.

Criterion: The operator shall have an integrated pest management programme based on ecological principles for the control of harmful pests (insects, plants, animals and microbes). The programme shall give priority to the use of physical, mechanical, cultural and biological control methods, and the least possible use of agrochemicals. The program shall include non-chemical Pest monitoring, scouting, Record of non-chemical practices re-entry intervals and sound disposal of pesticide containers

Indicators

- a) The operator shall have a plan for eliminating the use of all endocrine disruptions and cholinesterase inhibiting substances, carcinogenic and mutagenic causing substances WHO Class 1a and 1b, WHO class II and all highly hazardous chemical substances under the Stockholm convention on persistent organic pollutants (Pops Convention)
- b) The operator shall ensure that dosage/rates, re-entry periods and postharvest intervals are strictly observed. Measures shall be put in place to ensure that this information is documented and publicly communicated.
- c) The operator shall ensure all employees engaged in any chemical application are trained on safe use of chemicals; provided with adequate personal protective equipment and trained on their safe usage.

6.3 Safety & Quality compliance

Criterion: The operator shall follow a written and updated occupational health, safety and hygiene policy and procedures, including issues of risk assessment in accordance with internationally recognized standards. This will cover products & processes along the entire EBA-based clean energy powered industrialization value chain. Among specific areas of conformity include safety, ergonomics, packaging & labelling (nutritional values, sell-by-dates etc.) as applicable.

Some key requirements include:

- a) Evidence of water quality testing with scores conforming to relevant international / ISO criteria and with quality specifications & criteria defined by the National Standards bodies for the relevant point of use along the agro-value chain. E.g. farm level agriculture water e.g. for irrigation or aquaculture may be of lower standard than water used for final processing of agro-produce;
- b) Quality of non-water inputs shall conform to relevant international / ISO criteria & scores and with those specified by the National Standards Bodies & in relevant code of practice in the country;

- c) Products must undergo relevant testing to ascertain quality aspects of nutritional value, toxicology testing and related & ancillary parameters as specified by the National Standards Bodies & in relevant code of practice in the country;
- d) Ergonomics & safety of equipment, buildings etc. must fulfill the set criteria in respective. Safety standards for site activities shall follow those specified in the National Standards Bodies & in relevant code of practice in the country; and
- e) For final products, where applicable, packaging must be hygienic. Labeling must be legible and cover key aspects like shelf-life, nutritional values and related & ancillary parameters as specified by the National Standards Bodies & in relevant code of practice in the country.

Indicators

Inputs – water is a critical input not adequately covered in the preceding sections. Other critical non-water inputs e.g. fertilizer, seeds, technologies etc., are covered under the “environment compliance” and “health & organic compliance” sections.

6.3.1 Water management

Principle: To maintain or enhance the quality and quantity of surface and ground water resources, and respect prior formal or customary water rights.

6.3.1.1 Water rights

Criterion: Operators shall respect the existing water rights of local and indigenous communities.

Indicators

6.3.1.1.1 Evidence that the operation(s) do not negatively affect (i.e. reduce and/or alter in quality or quantity) the water supply to communities which rely on the same water resource(s). This usually includes objective evidence:

- a) identifying the communities which rely on the same water resource(s) as operation(s);
- b) analyzing the water supply to communities which rely on the same water resource(s);
- c) analyzing whether the water supply to communities which rely on the same water resource(s) is affected in quality or quantity by operation(s); and
- d) ensuring use of water for operations shall not be at the expense of the water needed by the communities that rely on the same water source(s) for subsistence.

6.3.1.1.2 Evidence of evaluation of the actual and potential impacts of operation(s) on the availability of water resource(s) within the local community.

6.3.1.1.3 If the screening exercise indicated any significant potential impacts of operations on water availability within the local community and ecosystems, the operator provides objective evidence demonstrating that a water rights impact assessment has been completed and any actual or potential negative impacts of operation(s) on the availability of water resource(s) within the local community have been mitigated.

6.3.1.1.4 Evidence demonstrating continuous monitoring of the actual and potential impacts of bioenergy operation(s) on the availability of water resource(s) within the local community.

6.3.1.1.5 Evidence that the use of the water resource(s) for operation(s) is not legitimately disputed by stakeholders who rely on the same water resource(s).

6.3.1.1.6 Evidence that the use of the water resource(s) for operation(s) has been agreed with free, prior and informed consent by stakeholders who rely on the same water resource(s).

6.3.1.1.7 Evidence that the use of the water resource(s) for operation(s) has been consulted with water regulatory authorities, local water experts, community members, and indigenous peoples which relate to and/or rely on the same water resource(s) to:

- a) identify all stakeholders who rely on the same water resource(s);
- b) identify formal water rights relating to the same water resource(s);
- c) identify customary water rights relating to the same water resource(s);
- d) evaluate the actual and potential impacts of operation(s) on the same water resource(s);
- e) evaluate and identify measures to fully mitigate the actual and potential impacts of operation(s) on the same water resource(s);
- f) evaluate and identify measures to fully protect the formal or customary water rights to the same water resource(s) and to prevent infringement and/or compromising of such rights;
- g) ensure that the formal or customary water rights to the same water resource(s) are only modified based on Free, Prior and Informed Consent of stakeholders relating to and/or relying on the same water resource(s);
- h) ensure that there is priority to human consumption (indicator); and
- i) evaluate and identify measures to continuously monitor and ensure comprehensive implementation of the requirements detailed above (a – h).

6.3.1.1.8 Evidence that the outcomes and agreements resulting from the consultation process detailed under the preceding indicator are comprehensively and fully implemented.

6.3.1.1.9 Supporting documents of water rights and permissions on overall process and irrigation water withdrawal.

6.3.1.2 Water management plan

Criterion: Water resources are managed at the local and/or site level to protect water quality and quantity over time and taking the watershed into account.

Indicators

6.3.1.2.1 The source, quantity and quality of water withdrawal are identified.

6.3.1.2.2 Evidence demonstrating that valid abstraction licences or permits have been obtained.

6.3.1.2.3 The operator has developed and implemented a water management plan that includes measurements and monitoring.

6.3.1.2.4 The operator has implemented measures to address the impacts of water withdrawal on the quality of water resources.

6.3.1.2.5 The operator has implemented measures to address the availability of surface or groundwater resources in water-scarce countries.

6.3.1.2.6 The operator's water management plan addresses riparian areas and other areas which receive direct water run-off from the area of operation.

6.3.1.2.7 Evidence that the water management plan is available to the public unless this is limited by national law or international agreements on intellectual property.

6.3.1.2.8 Evidence that the water management plan is consistent with local conditions of rainfall, water storage, water distribution and water treatment.

6.3.1.2.9 Evidence demonstrating that the water management plan is consistent with any other regional or local water management plans.

6.3.1.2.10 Evidence that any negative impacts resulting directly or indirectly from the operation(s) on the water resources of the neighbouring areas are mitigated fully.

6.3.1.2.11 Evidence that the water management plan is reviewed and revised periodically (i.e. at least annually) to assess its effectiveness at achieving its stated objectives.

6.3.1.2.12 Evidence that best practices measures for reusing or recycling of waste water have been identified and are implemented over time.

6.3.1.2.13 Evidence that the water management plan uses solutions that lower the risk for impaired water quality.

6.3.1.2.14 Evidence that the water management plan uses solutions that lower the risk for exhaustion and overuse of regional water resources.

6.3.1.2.15 Evidence that the water management plan contains measures to protect water courses and wetlands, including maintaining and restoring appropriate riparian buffer zones.

6.3.1.2.16 Evidence demonstrating that the water management plan contains measures to optimize the use, handling, storage and disposal of fertilizers, herbicides, pesticides, fuels and other chemicals from an environmental perspective.

6.3.1.2.17 Evidence demonstrating that the water management plan contains measures to avoid depletion of surface or groundwater resources beyond replenishment capacities.

6.3.1.2.18 Evidence demonstrating that the water management plan contains measures to contribute to the enhancement or maintaining of the quality of surface or groundwater resources.

6.3.1.2.19 The operator has identified the quantity and quality of final effluents to the receiving water body or treatment plant.

6.3.1.2.20 Where freshwater intensive operations are established in drought prone areas or where irrigated crops are used in drought prone areas, the operator provides objective evidence demonstrating that best available practices are used, and that measures are implemented to mitigate changes in water quantity and quality.

6.3.1.2.21 In drought-prone areas, irrigation is not used unless the operator can demonstrate the existence of implemented mitigation measures that ensure the level of water resources used remains stable.

6.3.1.2.22 Evidence that the use of water from natural water bodies does not result in a permanent change in its natural course or change the physical, chemical or biological equilibrium the water body had before the operation(s) started.

6.3.1.2.23 Evidence that efficiency of water use has improved over time through implementation measures to conserve water.

6.3.1.2.24 Evidence that critical aquifer recharge areas, replenishment capacities of local water tables, watercourses, and ecosystem needs have been identified and evaluated.

6.3.1.2.25 Evidence that any potential negative impacts of bioenergy operation(s) on local water tables, watercourses, and ecosystem needs have been mitigated.

6.3.1.2.26 Evidence that the use and share of water resources has been agreed upon with local experts and the community, and that all water user committees have been consulted.

6.3.1.3 Water quality

Criterion: Sources can be surface, ground or recycled. Project operations shall contribute to the enhancement or maintaining of the quality of both surface and groundwater resources. Quality parameters to focus include physical (colour, turbidity, odour / test, temperature); chemical (salinity/TDS², pH, BOD³, dissolved oxygen, bacteriological composition (total bacteria, coliform, e-coli & salmonella sp).

Indicators

6.3.1.3.1 Evidence that bio-energy is not produced or processed in critical aquifer recharge areas, without official authorization from relevant legal authorities.

6.3.1.3.2 Evidence of availability of best practices to maintain or enhance the quality of water resources to their optimal level are implemented in the bio-energy operations to ensure sustained water supply, ecosystem functioning and ecological services.

6.3.1.3.3 Evidence that sufficient precautions have been taken to contain effluents from the bio-energy operation(s) and prevent contamination of water resources. This includes treatment and/or recycling of waste water and the establishment of buffer zones between the operation site and surface or ground water resources.

6.3.1.3.3 Evidence that emergency plans and measures are in place, known and implemented in the operation(s) in case accidental contamination of water resources is identified.

6.3.1.3.4 For bio-energy operations where degradation of water resources existed before said operation was accepted, the bio-energy operator provides objective evidence of mitigation measures to be implemented to reverse the degradation of water resources and that the bio-energy operator has taken part in projects to improve water quality at the watershed level.

6.3.1.3.5 Evidence that waste water or runoff with organic or mineral contaminants are treated, recycled or properly disposed of.

² Total dissolved solids

³ Biochemical oxygen demand

6.3.1.3.6 Where the screening exercise has triggered the need for a Water Assessment, the bio-energy operator provides objective evidence that studies have been conducted to determine the optimal water quality level required to sustain the system, taking into account local, climatic, hydrologic and ecologic conditions.

6.3.1.4 Fresh water supply

Criterion: The agriculture management shall be aimed at the insurance of freshwater supply and quality for sustainable food production and sustainable rural development.

Indicators

6.3.1.4.1 Efficiency and productivity of agricultural water use for better utilization of limited water resources has to increase.

6.3.1.4.2 Monitoring of the irrigation performance.

6.3.1.4.3 Proper disposal of sewage and waste from the farm and human settlements and of manure produces by intensive life stock breeding.

6.3.1.4.4 Water quality has to be monitored on biological, physical and chemical quality.

6.3.1.4.5 Measures have to be taken to minimize soil run-off and sedimentation.

6.3.1.4.6 Irrigation has to be planned in a long term program.

6.3.1.4.7 Long term strategies and implementation program have to be developed on water use under scarce conditions.

6.3.1.4.8 Waste water re-use has to be part of the agriculture management system.

6.3.1.5 Products

Products must undergo relevant testing to ascertain quality aspects of nutritional value, toxicology testing and related & ancillary parameters as specified internationally by the WHO and by the National Standards Bodies & in relevant code of practice in the country.

For final products, where applicable, packaging must be hygienic. Labeling must be legible and cover key aspects like shelf-life, nutritional values and related & ancillary parameters as specified internationally and by the National Standards Bodies & in relevant code of practice in the country.

6.3.1.6 Processes

Ergonomics & safety of equipment, buildings etc. must fulfill the set criteria in respective Safety standards for site activities shall follow those specified in the National Standards Bodies & in relevant code of practice in the country

6.3.1.6.1 Evidence that conditions of safety and health at the work place are in consistent compliance with the provisions of ILO convention 155 and 184.

6.3.1.6.2 Producers and their employees demonstrate an awareness and understanding of health and safety matters.

6.3.1.6.3 Relevant health and safety risks are identified, procedures are developed to address these risks by employers, and these are monitored.

6.3.1.6.4 Potentially hazardous tasks are only carried out by capable and competent people who do not face specific health risks.

6.3.1.6.5 Evidence demonstrating that workers are skilled in the implementation of their prescribed activities and jobs to minimize health and safety risks and the risk of work related accidents.

6.3.1.6.6 The operator has a health and safety policy in place, which applies to all workers, including contractors, and out growers.

6.3.1.6.7 Evidence demonstrating that procedures and measures addressing emergencies and accidents are in place, fully implemented, continuously monitored and improved, and apply to all workers engaged in the operations of the participating operator.

6.3.1.6.8 Evidence demonstrating that all workers understand the operators' accident and emergency prevention, preparedness and response arrangements and measures.

6.3.1.6.9 The operator maintains, and reviews periodically records of all work-related accidents, incidents and diseases and adjusts its accident and emergency procedures to minimize the risk of work-related accidents.

6.3.1.6.10 Evidence demonstrating that first aid kits, fire extinguishers, and spill and operator contamination response material are available in sufficient quantity (i.e. readily available and accessible to workers) and quality (i.e. current and periodically serviced and appropriate to address the associated hazards and risks) at all sites including mobile facilities and that workers are knowledgeable of such equipment and its use.

6.3.1.6.11 Evidence demonstrating that all workers (including subcontractors) are provided with and regularly use personal protective equipment to protect them from all occupational health and safety hazards associated with their respective jobs.

6.3.1.6.12 Evidence that there is a system of warnings followed by legally-permitted sanctions for workers that do not apply safety requirements.

6.3.1.6.13 Objective evidence of a work and safety plan demonstrating that all workers (including subcontractors) are:

- a) trained, knowledgeable and regularly using protective equipment and installations;
- b) trained and knowledgeable in interpretation of labels, markings, signs, and other safety relevant audio and/or visual signals;
- c) trained and knowledgeable about work-related health and safety risks and preventative measures for minimizing the risk to health and safety;
- d) trained and knowledgeable about work-related risks to the environment and/or society;
- e) trained and knowledgeable about accident and emergency procedures;
- f) trained and knowledgeable about correct application, transport, storage and handling of hazardous substances and waste; and
- g) trained and knowledgeable about all other aspects of the operation(s) of the participating operator that pose occupational health and safety risks or risks to the environment and/or to society.

6.3.1.6.14 In operation(s) other than small operations the operator provides objective evidence demonstrating that specially trained and equipped teams have been established to respond to accidents and emergencies without delay.

6.3.1.6.15 Evidence demonstrating that all workers have access to clean sanitary facilities and potable (drinking) water.

6.3.1.6.16 Evidence that any living quarters and infrastructure for sleeping, for sanitary facilities (e.g. toilet/latrines, showers, etc.) and facilities for storing, preparing and distributing of food provided to workers are designed, built and regularly maintained to meet the basic needs of the personnel and their families, and comply with legal requirements, and ensure safe and healthy conditions.

6.3.1.6.17 Workers engaged in the operation(s) of the operator confirm that housing provided by the operator is in good structural condition, is maintained sufficiently and offers sufficient privacy, sanitary, health, and safety conditions.

6.3.1.6.18 Evidence that the management does hold regular two-way communication meetings with their employees where issues related to worker health, safety and welfare can be discussed openly.

6.3.1.7 Waste and pollution management

Principle: To ensure the responsible management of wastes and pollutants.

Criterion: The operator shall identify and document all elements of waste and pollutants generated by the enterprise. The operator shall develop and implement an integrated waste management programme based on the concept of the waste management hierarchy, that is: avoidance, reuse, recycling and reprocessing, waste treatment and waste disposal, and ensuring proper management of unavoidable pollution and waste, especially as regards the disposal of obsolete pesticides and chemicals.

Indicator

The operator shall classify all the wastes and pollutants generated by the enterprise and adopt best practices for each class. To the extent possible restrain from the use of open waste dumps and open-air burning of waste.

6.4 Compliance and Enforcement

6.4.1 Enforcement & compliance monitoring shall be in accordance with the existing structure & processes of the National Standards Regulator in the country.

6.4.2 Where the National Standards Regulator perceives a need for additional enforcement layers, then added actions including stakeholder training & use of barcoding systems as primary pre-requisites can be included. In such a case, the following additional actions are also recommended;

6.4.2.1 Enforcement: shall be fostered through ICT / barcode technology. Relevant country ICT tools from EBAFOSA stakeholders will be used to monitor compliance and effect a token payment where applicable.

6.4.2.2 Enforcement shall have 2 components - a human component entailing training & physical evaluation and an ICT component entailing payment & bar-code tracking to check against counterfeiting. Certified products will receive a quality mark stamped on the package. This mark will contain a barcode. Tracking will be achieved by feeding this barcode into a mobile system which evaluates genuine & counterfeits.

6.4.2.3 The training element will be based on Innovative Volunteerism, where EBAFOSA country leadership will mobilize volunteers, who will work with relevant ICT actors to train a group of volunteers on the standard & requirements for compliance. Trained volunteers will then train potential end-users on compliance requirements and engage in validating applicants for the standard.

6.4.2.4 Qualifying end-users will be required to make a token payment for processing the certification. After which working with their EBAFOSA National branches, their products will be marketed and linked to markets leveraging on the standard. The amount paid by a stakeholder is ploughed back to support the volunteers, support the IT system & pay relevant National Bureau of Standards fees.

6.4.2.5 Payment to be ICT enabled where relevant country ICT tools operated by EBAFOSA stakeholders will be used to process payments.

6.4.2.6 Tracking of compliance to be through ICT / barcodes where relevant country ICT tools operated by EBAFOSA stakeholders will be used.

6.4.2.7 Stakeholder capacity building / training: shall be conducted through online, face-to-face classroom based and hands on training as applicable.

6.4.2.8 National Bureau of Standards working with EBAFOSA National leadership & stakeholders shall be responsible for issuance of compliance certifications / marks of quality.

6.4.2.9 All relevant additional compliance rules & regulations specified by National Standards Regulators shall apply for this guide.

6.4.3 Additional evaluation requirements

6.4.3.1 Handling and segregation of certified products

Principle: To ensure the integrity of certified products throughout the phases of handling, storage, processing and transport.

6.4.3.2 Handling of certified products

Criterion: The operator shall keep records of all inputs, sales and deliveries and have up-to-date certificates from each supplier. If certified ingredients are imported, the operator shall have transaction certificates for each consignment he/she has received, or some other method of proving traceability.

Indicators

6.4.3.2.1 The integrity of certified products shall be ensured throughout the phases of post-harvest handling, storage, processing and transport.

6.4.3.2.2 All certified products shall be clearly identifiable as certified.

6.4.3.2.3 The operator shall ensure that certified products do not come into contact with chemical cleaning materials and methods.

6.4.3.2.4 In cases where the operator is not the actual producer of the product the operator shall endeavour to source goods and services ethically from suppliers whose practices are consistent with this guide. Written contractual arrangements shall be put in place in accordance with existing national and/or international laws. The contract shall include but not limited to; mutually agreed payment terms and arbitration conditions.

6.4.3.2.5 The operator shall ensure that relevant market information, quality specification, pricing information is shared with all contracted value chain actors

6.4.3.3 Segregation of certified and uncertified products

Criterion: The operator shall establish a system for avoiding the mixing of certified products with non-certified products in its facilities, including harvesting, handling, storage, processing and packaging of products, as well as transportation.

Indicators

6.4.3.3.1 All transactions involving certified products are recorded.

6.4.3.3.2 Products leaving the farm are duly identified and accompanied with the relevant documentation indicating a certified farm as origin.

6.4.3.3.3 Evidence of a system for separation

Annex A (normative)

IEC Standards applicable to off-grid electrification

Technology	Description	Reference (IEC)
Solar	Panels	IEC 61215 IEC 61646
	Charge controllers	IEC 62509 IEC 62109-1 IEC 62109-3 IEC 62093 IEC CISPR 11 IEC 61000-4 PV GAP, PVRS6A "Charge controllers for photovoltaic stand-alone systems with a nominal voltage below 50V" accepted for use in the IECEE PV scheme.
	Inverters	IEC 61683 IEC 62109 IEC 62093 IEC CISPR 11 IEC 61000-4 PV GAP, PVRS 8A "Inverters for photo-voltaic stand-alone systems."
	Balance of System (BOS) components and minor equipment	IEC 60669-1 IEC 60227-1-4
	Pumping systems	IEC 62253 - Photovoltaic pumping systems – Design qualification and performance

		measurements
Wind	Turbine	IEC 61400-2 IEC 61400-11 IEC 61400-12
Micro and pico hydro	Turbines and generator (rotating electrical machines)	IEC 60034 – 1 IEC 61362 IEC 61366-1 IEC 61116-1992
	Field Acceptance Test for Hydraulic performance of turbine	IEC 60041: 1991
	Governing system for hydraulic turbines	IEC 6030
	Transformers	IS 3156 – 1992 IS 2705 – 1992 IS 2026 - 1983
	Inlet valves for hydro power stations & systems	IS 7326 – 1902
	Guide for commissioning, operation and maintenance of hydraulic turbines	IEC 60545 (1976-01)
	Hydraulic turbines, storage pumps and pump turbines – Model acceptance tests	IEC 60041 (1991-11)
	Hydraulic turbines, storage pumps and pump-turbines	IEC 61366 series
	Hydraulic machines – Acceptance tests of small hydroelectric installations	IEC 62006

Annex B (normative)

Relevant IEC International Standards for energy storage

IEC 62933 series - Electrical Energy Storage (EES) systems

IEC 61056 series - General purpose lead-acid batteries (valve-regulated types)

IEC 61427 series - Secondary cells and batteries for photovoltaic energy systems – General requirements and methods of test

IEC 61951 series - Secondary cells and batteries containing alkaline or other non-acid electrolytes – Portable sealed rechargeable single cells

IEC 61959 - Secondary cells and batteries containing alkaline or other non-acid electrolytes – Mechanical tests for sealed portable secondary cells and batteries

IEC 61960 - Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for portable applications

IEC 62133 - Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications

IEC 62281 - Safety of primary and secondary lithium cells and batteries during transport

IEC 62282 series - Fuel cell technologies

IEC 62485 series - Safety requirements for secondary batteries and battery installations

IEC 62619 - Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for large format secondary lithium cells and batteries for use in industrial applications

IEC 62620 - Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for use in industrial applications

Annex C (normative)

Other applicable IEC International Standards relevant for rural electrification

Electric cables and installations

IEC 60227 series - Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V

IEC 60287 series - Electric cables

Safety and environment

(EMC, classification, fire hazard, circuit breakers, electric shock, insulation)

IEC 60068 series - Environmental testing

IEC 60071 series - Insulation coordination

IEC 60529 - Degrees of protection provided by enclosures (IP Code)

IEC 60664 series - Insulation coordination for equipment within low-voltage systems

IEC 60721 series - Classification of environmental conditions

IEC 61000 series - Electromagnetic compatibility (EMC)

IEC 61140 - Protection against electric shock – Common aspects for installation and equipment

IEC 62262 - Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)

IEC 62305 series - Protection against lightning

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Certification marking

Products that conform to Uganda standards may be marked with Uganda National Bureau of Standards (UNBS) Certification Mark shown in the figure below.

The use of the UNBS Certification Mark is governed by the Standards Act, and the Regulations made thereunder. This mark can be used only by those licensed under the certification mark scheme operated by the Uganda National Bureau of Standards and in conjunction with the relevant Uganda Standard. The presence of this mark on a product or in relation to a product is an assurance that the goods comply with the requirements of that standard under a system of supervision, control and testing in accordance with the certification mark scheme of the Uganda National Bureau of Standards. UNBS marked products are continually checked by UNBS for conformity to that standard.

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