

TECHNICAL SPECIFICATION

Renewable energy off-grid systems –
Part 100: Overview of the IEC 62257 series

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TECHNICAL SPECIFICATION

**Renewable energy off-grid systems –
Part 100: Overview of the IEC 62257 series**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 27.160

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RENEWABLE ENERGY OFF-GRID SYSTEMS –**Part 100: Overview of the IEC 62257 series****FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC TS 62257-100 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems. It was developed in cooperation with other IEC technical committees and subcommittees dealing with renewable energies and related matters, namely IEC technical committee 21: Secondary cells and batteries, subcommittee 21A: Secondary cells and batteries containing alkaline or other non-acid electrolytes, IEC technical committee 64: Electrical installations and protection against electric shock, IEC technical committee 88: Wind energy generation systems. It is a Technical Specification.

This first edition of IEC TS 62257-100 cancels and replaces the third edition of IEC TS 62257-1 issued in 2015. It constitutes a major technical revision. This new edition of the introductory document transitions the entire series to a 3-digit numbering scheme. The overall numbering scheme is presented, including planned topics and sub-topics, to assist in organizing future documents and to differentiate the new documents from those under the former scheme. This major re-organization and update of the series was determined by JWG1 to be necessary to accommodate major advances within this subject area.

The main technical changes with regard to the previous edition's introductory document, IEC TS 62257-1, are as follows:

- describe the major updates for the IEC 62257 series;
- new simplified title for the series “Renewable energy off-grid systems”, which will precede individual part numbers;
- provide an introduction to the entire series, including the updated organization and planned content of the IEC 62257 series;
- add example user case studies to assist various users in selecting relevant parts within the series;
- removal of content replicated in other documents and relocation of some information to other planned documents in this series;
- addition of general information on access to electricity;
- additional information on managing a renewable energy off-grid project including tendering;
- removal of an annex containing definitions, originally intended to cover all documents in the series; future documents published under this new scheme will contain definitions for individual documents within that document itself.

This technical specification should be used in conjunction with the other documents of the IEC 62257 series, as relevant.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
82/2028/DTS	82/2066/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 62257 series, published under the general title *Renewable energy off-grid systems*, can be found on the IEC website.

Future standards in this series will carry the new general title and three-digit numbering. Titles and numbers of existing standards in this series will be updated at the time of their next edition.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

The IEC 62257 series provides technical standardization to different stakeholders (including but not limited to project developers, financing agencies, testing agencies, installers, etc.) involved in electrification projects for access to electricity for those not solely connected to the regional grid, through the setting up of off-grid renewable energy and hybrid systems (including micro-grids) with a voltage less than or equal to 1 000 V for AC (alternating current) or a voltage less than or equal to 1 500 V for DC (direct current).

Access to electricity is one of the predominant policy actions designed to increase the well-being of populations, together with access to clean water, improved healthcare, education, personal advancement and economic development. Increasing access to electricity through utilization of renewable off-grid electricity also directly or indirectly supports various United Nations Sustainability Development Goals (<https://sdgs.un.org/goals>), depending on the application.

Several strategies can be adopted to implement electrification and improve access to electricity in rural and urban settings, including the ability for connection to a national or regional electricity grid. The IEC 62257 series applies to cases where the utility grid is too far away, the individual demand centres are too small to make grid access economical: off-grid solutions provide an economical option, and where autonomous power systems can be used to supply these services.

These technical specifications are used to:

- a) choose the right solution for the right place with the optimal technology,
- b) design, purchase and install the product(s) and/or system to optimal compliancy,
- c) operate and maintain the system.

The IEC 62257 technical specifications focus on enabling access to electricity by concentrating on, but not being specific to, developing countries. This series shall not be considered as all-inclusive for access to electricity. That means that the technical specifications could be used for rural electrification, also for electrification of remote sites in developed countries, or any requirement for electricity access that cannot be met by attaching solely to the national utility grid. They promote the use of renewable energies, but at this time they do not deal with clean-energy mechanisms development (CO₂ emission, carbon credit, etc.). The series does allow for other types of energy, such as diesel generators, to be included as part of a hybrid renewable energy off-grid system.

This consistent set of documents may be considered as a whole, with different parts focusing on specific aspects of renewable energy off-grid systems. However, several parts are intended to be read as stand-alone documents depending on their intended application. IEC TS 62257-100 provides an overview of the various topics covered by this series. Additionally, the content and scopes of individual documents, available at the website webstore.iec.ch, provide potential users with the intended application for each document. For further information on planned documents to be published under the new IEC 62257 numbering scheme, IEC TC82 committee members may refer to the annex in the JWG1 Program of Work circulated after each JWG1 meeting, or to the Planned Work Programme on the www.iec.ch TC82 website.

One of the main objectives of this series is to provide the minimum sufficient recommendations, including items for safety, sustainability of systems and at the lowest life cycle cost, relevant to the renewable energy and hybrid off-grid systems field of application.

RENEWABLE ENERGY OFF-GRID SYSTEMS –

Part 100: Overview of the IEC 62257 series

1 Scope

This part of the IEC 62257 series introduces the entire series regarding off-grid renewable energy and hybrid products and systems most commonly used for rural applications and access to electricity.

This Part 100 document provides a guide for facilitating the reading and the use of the IEC 62257 series for setting up off-grid electrification in developing countries or in developed countries, the only difference being the level of service and the needed quantity of energy that the customer can afford.

This Part 100 document introduces the series. It focuses on the planned document organization and numbering structure, including a description of each topic and subtopic grouping. It contains a brief overview of the project management and tendering process. It also contains a brief overview of the concept of “access to electricity” and some of the types of renewable energy off-grid and hybrid systems. This document has several examples of case studies for various user groups, to assist them in utilizing the updated series. Additionally, it contains an informative Annex A to assist users of prior versions of the IEC 62257-x series in locating content within the updated IEC 62257-xxx series.

This document outlines the organization of documents within the updated IEC 62257-xxx series published in 2022 and later, including utilization of a new 3-digit part numbering scheme, grouped into topics and subtopics.

This series is anticipated to be of interest to the following renewable energy off-grid and hybrid system stakeholders:

- manufacturers
- testing and certification labs
- equipment distributors, importers, and bulk buyers
- government regulators, inspection, certification, safety, customs and trade agencies
- agencies developing regional-level solar lantern / kit programs
- agencies developing RFQs (Request for Quotations) for systems
- system designers, engineers, project implementers, contractors, supervisors
- installers of small PV and storage
- installers of small wind systems
- installers of large hybrid systems with multiple users
- system owners, residents, operators, maintenance personnel.

The document part numbers to be assigned within this updated IEC 62257-xxx series will be grouped into topics as follows:

- Parts -1xx: Introduction and project management
- Parts -2xx: System design and installation
- Parts -3xx: Energy system components
- Parts -4xx: User equipment and appliances
- Parts -5xx: Stand-alone products and packaged kits.

To assist users in navigating the documents within the revised IEC 62257 series, this introductory -100 document presents how the documents will be further organized into the following subtopics, see Table 1.

Table 1 – Subtopics within the IEC 62257 series

Main topic	Subtopic Part #	Subtopic
Introduction and project management	-100	Overview of the IEC 62257 series
	-11x	Project management framework
	-12x	Tendering and evaluation
	-13x	Preliminary assessments
System design and installation	-20x	Design
	-21x	Installation
	-22x	Tools for installation
	-23x	Competency evaluation
Energy system components	-30x	Generators and energy conversion
	-31x	Photovoltaic modules
	-32x	Wind turbines
	-33x	Generator sets
	-34x	Batteries and battery management systems
	-35x	Inverters
	-36x	Balance of system components – DC
	-37x	Balance of system components – AC
User equipment and appliances	-40x	Off-grid loads
	-41x	Lighting
Stand-alone products and packaged kits	-50x	Stand-alone renewable energy products

Refer to the website address www.iec.ch for a list of published documents.

2 Normative references

The following documents are 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.

IEC TS 61836:2016, *Solar photovoltaic energy systems – Terms, definitions and symbols*

NOTE Refer to <http://www.iec.ch> for a list of the current available documents within the IEC 62257 series. Note that documents developed under the updated series referred to in this document have 3-digit part numbers, e.g. IEC TS 62257-100.

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms, definitions and abbreviations given in IEC TS 61836 and the following apply.

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

- IEC Electropedia: IEC 60050, available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

NOTE Terms and abbreviations, which appear within individual parts of the IEC 62257-xxx series, are defined in Clause 3 of the document in which the terms appear. Wherever possible, the document will adopt terms without modification from the PV Glossary, IEC TS 61836, or the IEC Electropedia, at <http://www.electropedia.org/>. If the existing definition is deemed inadequate, the existing definition may be modified or a new definition drafted. This approach to definitions will support standardization of terms used within the renewable energy off-grid industry.

3.1

competency

demonstration of appropriate technical knowledge and relevant skills to perform the designated tasks and responsibilities

3.2

generator

apparatus that converts non-electric energy into electric energy

Note 1 to entry: A generator does not include energy storage devices or power conditioners.

3.3

hybrid system

energy system comprised of multiple types of energy sources

Note 1 to entry: A source of energy may occasionally be the regional grid. A regional grid source introduces additional challenges addressed by other standards.

Note 2 to entry: A source of energy may include energy storage devices.

3.4

regional grid

regional electrical grid

national grid

national electrical grid

electrical grid

utility grid

electric power network

main grid

electrical distribution and/or transmission system for which an electrical utility is responsible

Note 1 to entry: Typically of regional or national scale to cover a large geographical area.

Note 2 to entry: Typically comprised of multiple sources of generation and loads.

[SOURCE: IEC TS 61836:2016, 3.3.29 and 3.3.29.2, modified to combine definitions into single term, to add common alternate terms, and to add Notes.]

3.5

offgrid

off-grid

off grid

electrified solely by stand-alone operation of the energy system, which may include storage and micro/mini-grids, and not in parallel with a utility grid <adjective or noun>

[SOURCE: IEC TS 61836:2016, 3.3.55.7 and 3.3.55.9, modified to combine definitions into single term, to add common alternate terms, and to include systems in addition to PV.]

3.6

PV

solar photovoltaic

3.7

renewable energy

primary energy the source of which is constantly replenished and will not become depleted

Note 1 to entry: Examples of renewable energy are: wind, solar, geothermal, hydropower.

Note 2 to entry: Fossil fuels are non-renewable.

[SOURCE: IEC 60050-617:2009, 617-04-11]

3.8

ESMAP

World Bank ESMAP Tier Structure

the Energy Sector Management Assistance Program is a global knowledge and technical assistance program administered by the World Bank

4 Background to renewable energy and hybrid off-grid systems

4.1 General

Where connection to a national or regional electricity grid is not possible or reliable enough to provide the desired level of electrification, renewable energy off grid and hybrid systems are typically used. These autonomous renewable energy and hybrid systems are able to provide electricity without connection to the larger utility grid.

Using renewable energy off-grid and hybrid systems to create “access to electricity” applies to cases where the regional grid is too far away and/or too costly for the user(s) to connect to the regional grid, and where autonomous power systems can be used to supply these services.

The amount of electricity available, and the duration it is available for, are dependent upon the generator type and size, storage available, system design, energy management techniques, and the user's demand profile.

For successful implementation of a project, knowledge of project management and tendering requirements may be required, in addition to technical knowledge.

4.2 Packaged and custom renewable energy off-grid and hybrid systems

There are 2 main types of renewable energy off-grid and hybrid systems available, both of which support access to electricity:

- packaged products;
- custom systems.

For small and simple applications, for example to provide light to allow students to study or to provide for simple household needs, packaged solutions are available. These range from small, handheld, integrated solar lantern products complete with solar PV module, battery, and lamp, to solar PV home kits which have all components for self-installation (except for the household's loads). These packaged solutions have been evaluated for compliance for their intended use per documents in this series.

NOTE Solar pumping stations which integrate a water pump driven directly by solar photovoltaics are evaluated to IEC 62253.

Off-grid systems are designed to supply power to demand points located in areas that cannot be easily (economically) connected to regional grids. These systems are customized to meet the local requirements and include hybrid and micro-grid options.

In most cases, these systems would provide the electrical demands for:

- individual homes;
- specific processes (examples: public pumping, battery charging centre, aquaculture);
- collective/communal facilities (examples: public lighting, schools, health and care centre, places of worship, administrative buildings);
- business activities (examples: workshops, micro industry, trade, stores);
- isolated villages.

These systems could either:

- supply electricity to a single load or single user;
- supply electricity to multiple users over a larger distance.

Systems for both end-use applications may be comprised of a single generator of a single type, multiple generators of a single type, or multiple types of generators. They may be provided with or without storage (often a chemical battery but could be water (hydro) or other type of storage). The user loads may be included as part of the system, or connection points may be provided to allow users to connect their own loads.

There are limits to the energy produced by the system based on the design criteria, available resources, and anticipated use profiles.

4.3 Project management and tendering

For all sizes and types of projects, proper management is important to achieve the desired goals.

The entire project shall be considered from start to finish. This typically starts with understanding the types of systems available, and properly assessing user needs (IEC 62257-13x). The deliverables shall be set from the beginning, including the quality of products and services provided, and training and maintenance programs (IEC 62257-12x).

For larger projects, collections of smaller projects, and externally-funded projects, setting up a formal project management approach (IEC 62257-11x) is also essential. In this case, either the funder or the hired project manager shall develop criteria to select appropriate designers, products, and installers, at the same time ensuring quality metrics are in place to evaluate successful implementation. Within the overall project management framework, forming an appropriate tender is an important factor in ensuring the project meets the intended goals. For some projects, additional project management roles may be required by an engineering or installer firm to manage all aspects of the project and comply with local regulations. For several types of project management commonly required for various renewable energy and hybrid electrification projects, guidance is given in the IEC TS 62257-1xx series. Regardless of whether external project management support is utilized, the entity requesting the work should still continue their high-level project management activities, to ensure that the work is carried out as agreed to, is of high quality, and is on time.

Setting up the requirements at the start of a project helps ensure that everyone involved is clear on the expectations and deliverables, and ensures the projects meet their intended purpose.

5 Organization and overview of the IEC 62257 series

5.1 General

The following information is intended to assist the user in finding the relevant information needed for each phase of their off-grid renewable energy or hybrid system project for electricity access, using the new IEC 62257-xxx numbering scheme.

The main topics of the series are given in Table 2.

**Table 2 – Organization of main topics within
IEC 62257: Renewable energy off-grid systems**

Topic #	Main topic	Document numbers
-100 series	Introduction and project management	IEC TS 62257-100 to IEC TS 62257-199
-200 series	System design and installation	IEC TS 62257-200 to IEC TS 62257-299
-300 series	Energy system components	IEC TS 62257-300 to IEC TS 62257-399
-400 series	User equipment and appliances	IEC TS 62257-400 to IEC TS 62257-499
-500 series	Stand-alone products and packaged kits	IEC TS 62257-500 to IEC TS 62257-599

Within the 5 main topics, subtopics have been designated to further guide users to the appropriate documents as they become available. These are indicated in the following subclauses.

For a list of published documents and most recent editions available within the new IEC 62257-xxx series, refer to the IEC website, www.iec.ch. The IEC webstore contains the scopes for each of the published documents, which should further assist the user in determining whether a specific document is appropriate for their intended application.

5.2 -100 Series: Introduction and project management

Documents within the -100 series cover introductory topics as well as project management including tendering, evaluations, and preliminary assessments, see Table 3.

Table 3 – Subtopics within the -100 series on Introduction and project management

Document numbering	Subtopic
-100	Overview of the IEC 62257 series
-11x	Project management framework
-12x	Tendering and evaluation
-13x	Preliminary assessments

IEC TS 62257-100: This document, titled *Overview of the IEC 62257 series*, introduces the series and provides an overview of each topic and subtopic. It also provides guidance to various intended users of the document, to assist them in utilizing the updated series. It contains a brief overview of the project management and tendering process.

Subtopic -11x: Project management framework: Documents within this subtopic will provide an overview of the project management framework for management of various types of projects covered by this series, as well as the stages in the process. It will describe phases of a project, how to assess quality of deliverables, and how to manage common types of projects.

Subtopic -12x: Tendering and evaluation: Documents within this subtopic are intended to assist users that are not conversant with the tendering process. They will highlight the use of prescriptive instead of descriptive approach to tendering, and include examples for government or non-government organization tendering.

Subtopic -13x: Preliminary assessments: Documents within this subtopic will assist users in selecting an appropriate solution for a specific application, using various assessments to evaluate the electrification requirements and to develop a solution for a specific application. This includes social aspects, economic considerations, sustainability objectives, environmental conditions, renewable energy resources, and energy demand projections. The documents

present various types and classifications of systems from individual to communal systems including examples from the World Bank ESMAP Tier structure, to assist with the assessment.

5.3 -200 Series: System design and installation

Documents within the -200 series on System design and installation focus on subtopics such as system design and system installation, including tools, evaluations, and competencies. This includes hybrid systems and micro-grids, see Table 4.

Table 4 – Subtopics within the -200 series on System design and installation

Document numbering	Subtopic
-20x	Design
-21x	Installation
-22x	Tools for installation
-23x	Competency evaluation

Subtopic -20x: Design: Documents within this subtopic focus on designing systems, including general design guidelines, power and energy calculations, and data management considerations.

Subtopic -21x: Installation: Documents within this subtopic focus on the installation of systems, with specific examples envisioned for certain applications.

NOTE For specific applications of small PV systems, design and installation elements will be intergraded into single documents within subtopic -21x to assist entrepreneurial installers.

Subtopic -22x: Tools for installation: Documents within this subtopic will include physical tools used for system installation and also methods to test and select systems.

Subtopic -23x: Competency evaluation: Documents within this subtopic are envisioned to cover competency and training of those involved in the system design and installation process.

5.4 -300 Series: Energy system components

Documents within the -300 series on Energy system components focus on the physical components which comprise an energy system. These documents are generally intended to complement and support the system requirements determined from the -100 and -200 series. This includes the electrical generators, electrical energy storage (batteries), and balance of system components. The -300 series focuses on the energy storage and generation side of a system, and does not include user/load equipment (-400 series) nor stand-alone products (-500 series), see Table 5. Where relevant, reference will be made to applicable documents, standards, and guidance, which may be available outside of the IEC 62257 series. The intent is not to duplicate existing type qualification documents, but rather to provide extra guidance on selection or other unique considerations that are applicable to this series.

Table 5 – Subtopics within the -300 series on Energy system components

Document numbering	Subtopic
-30x	Generators and energy conversion
-31x	Photovoltaic modules
-32x	Wind turbines
-33x	Generator sets
-34x	Batteries and battery management systems
-35x	Inverters
-36x	Balance of system components – DC
-37x	Balance of system components – AC

Subtopic -30x: Generators and energy conversion: Documents within this subtopic focus on general considerations for various types of energy sources as well as integration and management of them.

Subtopics -31x, -32x, and 33x: Documents within these subtopics relate to the specific generator technology.

Subtopics -34x, -35x, -36x, and -37x: Documents within these subtopics relate to energy storage, energy conversion, and various additional pieces of equipment necessary for various types of off-grid renewable energy and hybrid systems.

5.5 -400 Series: User equipment and appliances

Documents within the -400 series on user equipment and appliances focus on dedicated equipment and appliances often installed by the users for use with renewable energy and hybrid generation and storage systems covered by this series. See Table 6.

Table 6 – Subtopics within the -400 series on User equipment and appliances

Document numbering	Subtopic
-40x	Off-grid loads
-41x	Lighting

Subtopic -40x: Off-grid loads: Documents within this subtopic are envisioned to provide guidance and reference other standards and documents regarding off-grid, energy-efficient, and/or DC loads and appliances available for electrification. They may cross-reference other documents within this series for assessment, sizing, and energy efficiency considerations.

Subtopic -41x: Lighting: Documents in this subtopic assist users in selecting lamps and lighting appliances.

5.6 -500 Series: Stand-alone products and packaged kits

Documents within the -500 series focus on stand-alone products and packaged kits, see Table 7.

Table 7 – Subtopics within the -500 series on Stand-alone products and packaged kits

Document numbering	Subtopic
-50x	Stand-alone renewable energy products

It was decided by JWG1 that IEC TS 62257-9-5 and IEC TS 62257-9-8 will retain their original numbers from the previous numbering scheme at the onset of the transition to this new numbering scheme. They may eventually be renumbered within the -500 series to be consistent with document numbering in the updated series.

6 Example case studies for users of this series

6.1 General

The IEC 62257 series includes documents anticipated to be of interest and relevance to several stakeholders involved in implementation of renewable energy and hybrid systems for electricity access. The user groups are expected to include:

- manufacturers
- testing and certification labs
- equipment distributors, importers, and bulk buyers
- government regulators, inspection, certification, safety, customs and trade agencies
- agencies developing regional-level solar lantern / kit programs and RFQs for systems
- system designers
- engineers
- project implementers
- contractors
- supervisors
- installers of small PV and storage systems
- installers of small wind systems
- installers of large hybrid systems with multiple users
- system owners, residents, operators, maintenance personnel.

The different user groups are expected to utilize the revised IEC 62257 series to meet various objectives. Below are several examples of user groups utilizing this series, and in which subtopics they can expect to find documents of most relevance to their application. The following subclauses contain examples of a user locating documents of interest. Since individual document numbers will be assigned as new documents are written, the subtopics below provide general guidance on where to find documents of interest. The examples below are not intended to be prescriptive, exclusive, nor limited for a specific stakeholder.

NOTE A list of currently published documents and their scopes is available at the website address: webstore.iec.ch.

6.2 Example case study #1: Manufacturer of component for an off-grid wind system

In this example, the manufacturer notes that there is a standard pertaining to wind turbines under topic -32x. This manufacturer is also interested in the end use conditions and in their customer expectations, including the transportation needed to get their product to site and how their products will likely be handled.

This manufacturer may be interested in the considerations presented within subtopic -13x: Preliminary assessments, since several different local factors influencing design and selection of an off-grid / hybrid system are discussed. They may also be interested in topic -2xx: System design and installation, to learn how their users design and install their DC product in an off-grid system. Product design considerations, such as safety and performance of their products over the lifetime of their equipment is very important to this component manufacturer. They may therefore be interested in documents within the -30x: Generators and energy conversion and -36x: Balance of system components – DC subtopics relevant to their equipment. Depending on the type of equipment they produce, they may be also interested in the -40x: Off-grid loads subtopic documents related to user loads. Depending on the ratings and application of their specific component, other standards can apply.

6.3 Example case study #2: Certification testing lab for solar lanterns

Testing labs need to know testing protocols for the equipment they are testing, including sampling. They also need a good understanding of the specifications for their own test equipment. As a certification lab, they need to assess whether a product passes or fails a specification, or they may need to evaluate certain performance criteria.

In some cases, testing labs may be required to develop their own test methods based on the specific application. In this case, they may need a deeper understanding of the use environment and customer expectations.

- Pass/fail limits and/or rating criteria for standardized test methods.
- Generic safety or functionality or performance requirements for components that do not have standardized tests.

For the former, they can utilize the -500 series of documents: Stand-alone products and packaged kits, currently including IEC TS 62257-9-5 and IEC TS 62257-9-8.

For the latter, they should also review relevant documents within the -300: Energy system components and the -400: User equipment and appliances series of documents for additional information on the equipment with which to inform themselves. They should also consult the -13x documents to consider the various scenarios for which the products will be certified and used.

6.4 Example case study #3: Importer of solar products

A company importing a lot of solar products wants assurance that they are selling high quality products.

Therefore, they wish to place requirements on their suppliers, such as the products being tested and/or certified to relevant product standards. They find guidance within the -300: Energy system components and -500: Stand-alone products and packaged kits series, for solar products intended for use within systems (former) or as part of pre-packaged systems (latter).

6.5 Example case study #4: Agency developing regional-level RFQ for school PV systems

In this example, an agency is developing a regional-level Request-for-Quote (RFQ) for PV systems to be installed at schools, they have limited knowledge on preparing RFQs and also limited knowledge of both PV systems and the schools' energy needs.

The agency first decides to review the project management framework documents in the IEC TS 62257-11x: Project management framework subtopic. Based on this, they then decide to hire an experienced project manager to manage the procurement process. They require the project manager to follow IEC TS 62257-13x evaluation documents for performing the initial energy and site assessments and relevant IEC TS 62257-2xx documents for designing and installing the small school PV off-grid systems. They require that their project manager follow the guidelines in the IEC TS 62257-12x: Tendering and evaluation subtopic for tendering the work as well as for evaluating the quality of work completed.

6.6 Example case study #5: Installer of small PV systems

An installer of small PV systems wishes to make use of industry best practices for their installations, to give their customers confidence in their work.

They look up the appropriate document within the IEC TS 62257-21x topic for their size of installation. They find a document focusing on small residential PV installation. It has most of the information they require, since the TC 82 JWG1 standards writing group created a couple of documents with the IEC 62257 series specifically geared towards specific use cases for smaller installations. These documents include selection and evaluation of common components for this specific type of installation, as well recommendations for the installation itself. The document has a few other references, one of which is relevant to them and they decide to use it too. Their customers are really happy to know that their systems are being installed by an installer following an international technical specification.

6.7 Example case study #6: Retailer of solar lanterns and small solar kits

This store owner wants their customers to trust the products they sell and is really passionate about increasing the access to electricity for locals nearby who do not have access to the national electrical grid. They focus on selling hand-held solar lanterns but also want to sell some pre-packaged kits to families wanting to run a TV and small fridge as well as some lights and radio. Ten years prior, a foreign agency had installed two solar panels on a handful of homes, but they never worked and were turned into tables. The store owner heard that there is an industry standard to screen out poor-quality PV kits.

After reviewing the Scopes of the documents on the webstore.iec.ch website, they decide to require that their suppliers only bring them products that have been tested and certified to IEC TS 62257-9-5 or IEC TS 62257- 9-8 for solar lanterns and pre-packaged solar home kits. These are within the topic -500: Stand-alone products and packaged kits. They are very pleased to learn that these documents have been in use for several years and therefore there are many products available that have been tested and meet the requirements. The store owner feels good about selling their solar lanterns and kits and becomes known for their quality products.

6.8 Example case study #7: Off-grid system owners

A family with young children is looking at having a custom off-grid solar + wind + battery system installed. They want their systems to perform as expected. They have heard that installation is an important part of a system working as expected.

The parents and grandparents decide to research best practices. They quickly realize there is a lot of information, and instead of learning and doing everything themselves, they decide to hire experienced installers. They specify that the installers meet some international best practice guidelines. For example, they request that their installers follow the guidelines of the -21x: Installation subtopic and that the installation personnel have gone through -23x: Competency evaluation. They recommend that the people performing the work are familiar to the documents in -400: User equipment and appliances topic, because they also need help selecting appropriate appliances and lighting for their off-grid system.

Annex A (informative)

Reorganization of the IEC 62257 series

Starting in 2020, the IEC 62257 series, previously titled *Recommendations for renewable energy and hybrid systems for rural electrification*, is being completely updated by IEC TC 82 JWG1 to provide more relevant and up-to-date information to users, in an easier-to-use structure.

Content in the previous documents is being revisited as part of this process. Content from the previous editions may be redistributed amongst the new documents, if appropriate, while other information may be obsolete. It is anticipated that the new documents contain more up-to-date, useful, and relevant guidelines for generating and using off-grid renewable energy.

Table A.1 is provided for information use only. It is intended to be used as a reference only by previous users of the IEC 62257 series, to assist in locating prior information within the new structure. Note that content of documents under the new numbering system may be completely new or based on previous standards with major updates to their contents. It should also be noted that some contents and documents may be obsolete or not updated. If users of prior editions require access to older revisions, they can contact the IEC webstore for access to obsoleted documents.

NOTE: Only IEC TS 62257-9-5 and IEC TS 62257-9-8 are expected to retain their document numbers even under the new numbering scheme.

Refer to the scope and contents of individual documents within the new series to determine relevancy for a specific application. The scope for published documents within the IEC 62257 series, now titled *Renewable energy off-grid systems*, can be found for free preview on the following IEC website: webstore.iec.ch.

Table A.1 – Look-up table for users of prior versions of IEC 62257-x documents to potentially relevant subtopic(s) within the new IEC 62257-xxx scheme

Documents in the previous IEC 62257-x scheme			Subtopic(s) within new IEC 62257-xxx scheme, which may contain similar content	
Document #	Title	Last published edition	Sub-topic #	Subtopic
62257-1	General introduction to IEC 62257 series and rural electrification	2015, Ed.3	-100 -13x	Overview of the IEC 62257 series Preliminary assessments
62257-2	From requirements to a range of electrification systems	2015, Ed.3	-13x	Preliminary assessments
62257-3	Project development and management	2015, Ed.2	-11x -12x	Project management framework Tendering and evaluation
62257-4	System selection and design	2015, Ed.2	-13x	Preliminary assessments
62257-5	Protection against electrical hazards	2015, Ed.2	-13x -20x -21x	Preliminary assessments Design Installation
62257-6	Acceptance, operation, maintenance and replacement	2015, Ed.2	-13x -20x -21x	Preliminary assessments Design Installation
62257-7	Generators	2017, Ed.2	-30x	Generators and energy conversion