

# TECHNICAL SPECIFICATION

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**Recommendations for renewable energy and hybrid systems for rural  
electrification –  
Part 2: From requirements to a range of electrification systems**





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**Recommendations for renewable energy and hybrid systems for rural  
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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RECOMMENDATIONS FOR RENEWABLE ENERGY  
AND HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –****Part 2: From requirements to a range of electrification systems**

## FOREWORD

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62257-2, which is a technical specification, has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

This second edition cancels and replaces the first edition issued in 2004. It constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

- redefine the maximum AC voltage from 500 V to 1 000 V, the maximum DC voltage from 750 V to 1 500 V;
- removal of the limitation of 100 kVA system size. Hence the removal of the word “small” in the title and related references in this technical specification.

This technical specification is to be used in conjunction with the other documents of the IEC 62257 series.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
82/947/DTS	82/998A/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62257 series, published under the general title *Recommendations for renewable energy and hybrid systems for rural electrification*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.



## INTRODUCTION

The IEC 62257 series intends to provide to different players involved in rural electrification projects (such as project implementers, project contractors, project supervisors, installers, etc.) documents for the setting up of renewable energy and hybrid systems with AC voltage below 1 000 V and DC voltage below 1 500 V.

These documents are recommendations:

- a) to choose the right system for the right place;
- b) to design the system;
- c) to operate and maintain the system.

These documents are focused only on rural electrification concentrating on but not specific to developing countries. They should not be considered as all inclusive to rural electrification. The documents try to promote the use of renewable energies in rural electrification; they do not deal with clean mechanisms development at this time (CO<sub>2</sub> emission, carbon credit, etc.). Further developments in this field could be introduced in future steps.

This consistent set of documents is best considered as a whole with different parts corresponding to items for safety, sustainability of systems aiming at the lowest life cycle cost as possible. One of the main objectives is to provide the minimum sufficient requirements, relevant to the field of application that is: renewable energy and hybrid off-grid systems.

The purpose of this part of the IEC 62257 series is to propose a range of renewable energy based electrification systems able to meet the requirements of customers identified in the field of decentralized rural electrification projects.

This technical specification was developed in cooperation with other IEC technical committees and subcommittees dealing with renewable energies and related matters, namely technical committee 21 ("Secondary cells and batteries"), subcommittee 21A ("Secondary cells and batteries containing alkaline or other non-acid electrolytes"), technical committee 64 ("Electrical installations and protection against electric shock"), technical committee 88 ("Wind turbines"), and others.

# RECOMMENDATIONS FOR RENEWABLE ENERGY AND HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –

## Part 2: From requirements to a range of electrification systems

### 1 Scope

This part of IEC 62257 proposes a methodological approach for the setting up and carrying out of socio-economic studies as part of the framework of decentralized rural electrification projects. It is addressed to project teams and in particular to experts in charge of socio-economic studies in international projects.

The amount of detail gathered and the requisite number of experts needed would depend on the scale of the proposed project. For large projects involving many households, a detailed study would be required, for a project which involves a single or few households, the study could be truncated.

The information coming from such preliminary studies could be used for several purposes, such as more complete economic and financial studies of the electrification project.

This technical specification also provides some structures as technical solutions that could be recommended, depending on the qualitative and quantitative energy demands, consistent with the needs and financial situation of the customers.

Then, in relation with each model of the proposed range of systems, electrical architectures are proposed to technical project managers to assist in designing the systems.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60617 DB<sup>1</sup>, *Graphical symbols for diagrams*

IEC 62257-9 (all parts), *Recommendations for renewable energy and hybrid systems for rural electrification*

IEC 62257-12 (all parts), *Recommendations for renewable energy and hybrid systems for rural electrification*

### 3 Terms and definitions

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

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<sup>1</sup> "DB" refers to the IEC on-line database, available at <<http://std.iec.ch/iec60617>>