

IEEE Recommended Practice for the Planning and Design of the Microgrid

IEEE Standards Board

Developed by the
IEEE SASB Coordinating Committees/SCC21 on Fuel Cells, Photovoltaics, Dispersed
Generation, and Energy Storage (SASB/SCC21)

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of the
IEEE Standards Board

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Abstract: The factors that should be taken into account for planning and designing microgrids are covered in this recommended practice. It provides approaches and good practices to be considered in the planning and design, including system configuration, electrical system design, safety, power quality monitoring and control, electric energy measurement and scheme evaluation. This recommended practice applies to ac microgrids that can be either grid-connected or stand-alone microgrids.

Keywords: electric energy measurement, electrical system design, IEEE 2030.9™, power quality monitoring and control, planning and design, safety, scheme evaluation, system configuration

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Introduction

This introduction is not part of IEEE Std 2030.9–2019, IEEE Recommended Practice for the Planning and Design of the Microgrid.

This recommended practice focuses on the factors that should be taken into account for planning and designing microgrids. It provides approaches and good practices to be considered in the planning and design, including system configuration, electrical system design, safety, power quality monitoring and control, electric energy measurement and scheme evaluation. This recommended practice applies to ac microgrids that can be either grid-connected or stand-alone microgrids.

The main task of the microgrid planning and design is to determine the configuration of DERs, electrical network structure and the automation system configurations. Grid planners should take into consideration the local load profile, energy demand and energy resources when planning a microgrid. The result of the microgrid planning should be scalable enough to satisfy the immediate demand as well as the future demand growth.

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IEEE Recommended Practice for the Planning and Design of the Microgrid

1. Overview

This specification provides the recommended practice for the planning and design of microgrids. Additionally, there is a bibliography included as an annex that lists citations referred to in this document for informative purposes, but they are not required to be used in conjunction.

1.1 Scope

This recommended practice focuses on the factors that should be taken into account for planning and designing microgrids. It provides approaches and good practices to be considered in the planning and design, including system configuration, electrical system design, safety, power quality monitoring and control, electric energy measurement and scheme evaluation. This recommended practice applies to ac microgrids that can be either grid-connected or stand-alone microgrids.

1.2 Purpose

This recommended practice aims at standardization of the microgrid planning and design process by providing technical requirements and specifications. The recommended practice is to ensure the safety, economy, reliability and environmental friendliness of microgrids.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

The applicability of the following standards is determined by the specific requirements stated in this standard, such as requiring certain sections.

IEC 61000-4-30, Electromagnetic compatibility Part 4-30, Testing and Measurement Techniques-Power Quality Measurement Methods.¹

¹IEC publications are available from the International Electrotechnical Commission (<http://www.iec.ch>) and the American National Standards Institute (<http://www.ansi.org/>).