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IEEE Guide for the Benefit Evaluation of Electric Power Grid Customer Demand Response

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IEEE Guide for the Benefit Evaluation of Electric Power Grid Customer Demand Response

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of the
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Abstract: A framework for monitoring the effects and evaluating comprehensive benefits of demand response programs is proposed in this guide. From perspectives of ex-ante and ex-post evaluation, this guide introduces the evaluation processes on demand response effects with its comprehensive benefits and implemented calculation methods in detail. This guide could be applied in various electricity market structures to provide utilities with the references for the planning, design, implementation, and post-evaluation of demand response programs.

Keywords: benefits, demand response, effect monitoring, ex-ante evaluation, ex-post evaluation, IEEE 2030.6™

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Introduction

This introduction is not part of IEEE Std 2030.6-2016, IEEE Guide for the Benefit Evaluation of Electric Power Grid Customer Demand Response.

As the participation of demand response (DR) in electric power market becomes a hot topic, an increasing amount of DR related studies and applications have been conducted in China and all over the world. Therefore, the rules of DR in participating electricity markets and the program designs become increasingly significant.

The Effect monitoring index system and benefit evaluation system, which are scientifically reasonable, have important guiding significance on the design and implementation of DR programs and the regulation of DR markets. However, systematic and scientific guidance and universally accepted technical specifications on DR effect monitoring and benefit evaluation have not been established. To this end, the IEEE Guide for the Benefit Evaluation of Electric Power Grid Customer Demand Response is proposed. This guide establishes the effect monitoring index system of DR programs, and proposes the methods for DR baseline calculation and comprehensive benefit evaluation. According to the different DR program types from the perspective of different market entities, the proposed methods are able to perform corresponding comprehensive system analyze the benefits, and provide regulation and guidance to the projects under various market structures.

Contents

IEEE Guide for the Benefit Evaluation of Electric Power Grid Customer Demand Response

1. Overview

1.1 Scope

This guide describes the index framework of DR programs on effect monitoring and comprehensive benefit evaluation, and provides the detailed calculation methods. This guide could be used by DR sponsors, including independent system operator (ISO), region transmission organization (RTO), electricity distribution company (EDC), load service entity (LSE), governments, and other research institutes, to analyze the actual effects of DR programs, evaluate the comprehensive benefits of implementing DR programs, and provide guidance for the overall resource planning decision.

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.

IEC 60050-603, International Electrotechnical Vocabulary– Chapter 603: Generation, transmission, and distribution of electricity - Power systems planning and management.[1]

IEC 60050-617, International Electrotechnical Vocabulary– Part 617: Organization/Market of electricity.

IEC 60050-691 International Electrotechnical Vocabulary: Tariffs for electricity.

[1] IEC publications are available from the International Electrotechnical Commission (http://www.iec.ch/). IEC publications are also available in the United States from the American National Standards Institute (http://www.ansi.org/).