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Energy services — Guidelines for the assessment and improvement of the energy service to users

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National foreword

This British Standard is the UK implementation of ISO 50007:2017.

The UK participation in its preparation was entrusted to Technical Committee SVS/0, Customer service - Fundamental principles.

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Energy services — Guidelines for the assessment and improvement of the energy service to users

Services énergétiques — Lignes directrices pour l'évaluation et l'amélioration du service énergétique aux utilisateurs

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 301, *Energy management and energy savings*.

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Introduction

0.1 Energy issues: global context and policy framework

Energy services are critically important to sustainable development in light of the following:

— the importance of access to sustainable energy as a basic human need for the world's population as recognized by the United Nations General Assembly in 2011, by the UN Director General and the 2011 UNDP Human Development Report;

— the scale of the population (1,5 billion people without access to electricity) resulting in widespread resort to unsustainable, expensive, polluting and unsafe practices;

— the extent of poor service characterized by interruptions, fluctuations in supply and widespread network deterioration;

— the need for development of a service that is physically, environmentally and financially sustainable;

— global commitments to reduce emissions, noting that providing universal service for the poor population will have only a marginal impact on total emissions beyond existing commitments.

0.2 Energy services: general objectives

This document aims to address the following objectives:

— reducing arbitrary and irregular interruptions of supply;

— increasing information about, and promotion of, sustainable sources of supply;

— reducing aggregate demand, while providing the same or a higher level of energy services;

— improving on previously inadequate information about energy service development and conditions, especially energy efficiency and energy performance;

— improving the balance of contractual rights between provider and user;

— improving payment methods to make it easier for consumers to pay their bills;

— improving consumer responsibility and public participation in energy policy.

There is a broad array of bodies that can play a role in the improvement of energy services. These bodies can be publicly or privately owned. Examples of bodies responsible (in whole or in part) for oversight related to energy services include governments or public agencies (international, national, regional or local) acting with legal authority as legislators and regulators (relevant authorities) or as bodies charged with ensuring service delivery (responsible bodies).

The responsible bodies and relevant authorities are expected to consult with, and take into account, the interests of relevant stakeholders, which can include:

— associations of energy service providers (e.g. international, regional/multinational and national professional associations);

— non-governmental organizations (NGOs) and other autonomous bodies;

— users and associations of energy users;

— manufacturers of energy-using equipment, renewable energy sources and advanced technologies or methods.

Standardization and technical self-regulation are possible ways to ensure stakeholder involvement. It is beneficial if stakeholders are involved in both setting service objectives and assessing the adequacy and efficiency of service.

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Energy service providers are expected to meet the requirements of relevant authorities and the expectations specified by responsible bodies, while ensuring the long-term sustainability of the service. In a context of scarcity of resources, including financial resources, it is important that the investments made in installations are appropriate and that necessary attention is paid to proper maintenance and effective use of the installations. It is also important that tariffs generally aim at meeting cost-recovery principles and at promoting efficiency in the use of the resources and sustainability in terms of energy sources, while striving to maintain affordable basic access to energy services.

0.3 Objectives, content and implementation of this document

This document is intended to encourage good practice in the provision of energy service, especially where there is no adequate legislation, or where regulation or common practice falls short. Good practice as set out in this document covers areas such as service contracts, payment methods, price determinations, tariffs and subsidies, equitable supply management and the needs of poor and/or vulnerable consumers. This document outlines the evolution of energy services from simple provision of energy to more sophisticated concepts. These concepts include the provision of energy informational advice and services to guide users to manage costs and to promote efficiency and conservation.

This document is applicable to developed, developing and transitional economies, to complete and incomplete/intermittent networks and to integrated and non-integrated energy supply systems.

This document covers the following areas:

— definitions of scope and terms;

— description of guidelines on how to meet users' service needs and expectations;

— service assessment criteria in accordance with the guidelines;

— examples of performance indicators linked to the assessment criteria, which can be used for assessing service performance.

Because the delivery, ownership and regulation of energy service is organized based on the legal and institutional frameworks specific to each country, this document does not prescribe the respective roles of the different bodies, nor does it define required internal organization for local, regional or national bodies that can be involved in energy services provision. This document is applicable to publicly and privately owned and operated energy service providers alike, and does not favour any particular ownership or operational model.

This document is appropriate for fixed energy distribution networks of greater or lesser extent, as well as for networks or sites where on-site alternatives are appropriate. This document recognizes the need for flexibility in terms of engineering and hardware. This document's recommendations, such as consultation mechanisms, are intended to apply universally.

This document is consistent with management system standards such as ISO 50001, ISO 9001 and ISO 14001, but it is not dependent on the adoption of a management system standard. It is also consistent with the requirements on network services billing in ISO 14452.

The organizations within the scope of this document are energy service providers. However, in order to address users' needs and expectations pertaining to relevant authorities, responsible bodies and operators, this document is written from the perspective of the energy user rather than that of the energy service provider.

In this document, the following verbal forms are used:

— "shall" indicates a requirement;

— "should" indicates a recommendation;

— "may" indicates a permission;

— "can" indicates a possibility or a capacity.

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Energy services — Guidelines for the assessment and improvement of the energy service to users

1 Scope

This document addresses the relevant elements of energy service provided by energy suppliers to users. It envisages energy service as including two broad categories:

— energy supply/generation and distribution;

— advice on and improvement to energy efficiency.

This document provides best practice guidelines for energy service providers in order to continually improve their practices and quality of interaction with users.

The following are within the scope of this document:

— definition of a language common to the different stakeholders;

— definition of key components and characteristics of the energy service to users, with respect to their needs and expectations;

— guidelines for satisfying users' needs and expectations;

— assessment criteria for energy service to users;

— introduction to performance indicators;

— examples of performance indicators;

— performance improvement;

— education or training for users to understand the energy service provided by the energy service providers.

The following are outside the scope of this document:

— topics relating to individual energy service, such as energy efficiency service provided to individual users of energy or services provided by energy service companies (ESCOs);

— methods of design and construction of energy production, transmission and distribution systems;

— management structure and methodology of operation and management of activities relating to energy services, including contracting with other energy service providers;

— topics relating to energy services in systems inside buildings.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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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

— IEC Electropedia: available at http://www.electropedia.org/

3.1
affordability
degree to which the provision of an *energy service* (3.13) is economically bearable for *users* (3.50)

Note 1 to entry: Affordability can be estimated through the degree to which charges for an energy service can be paid by low income groups of users without significant adverse economic or social impact, taking into account allowances for subsidies and payment assistance programmes

Note 2 to entry: Certain countries apply a percentage threshold figure, most commonly 10 % of disposable income, above which households could be considered to be in "fuel poverty". This can however distort results in some cases, e.g. among high spending, high income households. To guide *tariff* (3.49) level decisions, the lowest decile of household incomes can be considered in order to check what percentage of disposable income would be taken up by a given level of charge. This information could enable an *energy service provider* (3.14) to understand how a rapid rise in percentage could result in people refusing to pay or dropping out of the system.

3.2
asset
item, thing or entity that has potential or actual value

Note 1 to entry: Assets can be tangible or intangible. Examples of tangible assets include land, buildings, heating, ventilation and air-conditioning systems, lighting systems, transmission lines, generating plants, transformer stations, storage depots, equipment and hardware. Examples of intangible assets include software and databases.

Note 2 to entry: Contrary to consumables, assets can be depreciated in accounting systems.

[SOURCE: ISO 55000:2014, 3.2.1, modified — The words "to an organization" have been deleted at the end of the definition, and the Notes to entry have been modified.]

3.3
asset management
coordinated activity of an *energy service provider* (3.14) to realize value from *assets* (3.2)

[SOURCE: ISO 55000:2014, 3.3.1, modified — The word "organization" has been replaced by the words "energy service provider" in the definition, and the original Notes to entry have been deleted.]

3.4
availability
extent to which the *infrastructure* (3.19), *assets* (3.2), resources and employees of an *energy service* (3.13) enable effective provision of *services* (3.44) to *users* (3.50) according to specified *performance* (3.26)

3.5
billing
conditions relating to charging for an *energy service* (3.13), terms of payment and information on applicable rates

3.6
community
general public in the geographical area served by a utility or other *energy service provider* (3.14), which can choose to engage with its customers through outreach programmes, consumer education and other forms of positive public relations

Note 1 to entry: The term can also refer to a "community of interest" such as one or more natural or legal persons, their associations, organizations or groups, having interests under the terms of which the *energy service* (3.13) is provided.

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3.7
confidence level
assessment of the *quality* (3.32) in terms of accuracy and *reliability* (3.37)

Note 1 to entry: The confidence level can be quantitative or qualitative.

3.8
connection
set of physical components ensuring the link between a *point-of-delivery* (3.27) and the local supply

3.9
continuity
number of hours of daily *service* (3.44), or number of hours per week in the event of service being available less than daily

3.10
coverage
extent to which the *assets* (3.2) of an *energy service provider* (3.14) permit *services* (3.44) to *users* (3.50), within its defined area of responsibility

Note 1 to entry: This is often defined as a percentage of households served within the distribution area.

3.11
effectiveness
extent to which planned activities are realized and planned results achieved

[SOURCE: ISO 9000:2015, 3.7.11, modified — Note to entry has been deleted.]

3.12
energy efficiency
ratio or other quantitative relationship between an output of *performance* (3.26), *service* (3.44), goods or energy, and an input of energy

EXAMPLE Conversion efficiency; energy required/energy used; output/input; theoretical energy used to operate/energy used to operate.

Note 1 to entry: Both input and output need to be clearly specified in quantity and *quality* (3.32), and be measurable.

[SOURCE: ISO 50001:2011, 3.8]

3.13
energy service
set of organization, *processes* (3.31), activities, means and resources necessary for production, transmission, distribution and supply of energy and for providing a physical benefit, utility or goods, which are derived from a combination of energy with energy-efficient technology or with action, which can include the operations, *maintenance* (3.21) and control necessary to deliver the *service* (3.44)

Note 1 to entry: Key features for an energy service include:

— its mission to provide an energy service;

— its physical area of responsibility and the population within this area;

— its *responsible body* (3.42);

— the general organization, with the function of *operator* (3.25) being carried out by the responsible body;

— the scope of the energy service offered by the *energy service provider* (3.14), or by other organizations operating in the same geographic area;

— the type of physical or information technology systems used to provide the services, with various degrees of centralization.

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Note 2 to entry: When it is not necessary or it is difficult to make a distinction between responsible body and operator, the term "energy service provider" covers both.

Note 3 to entry: In this document, the term "*energy services* (3.15)" (plural) refers to generic activities or energy uses such as heating or lighting or supply of natural gas, whereas the term "energy service" (singular) is used to refer to the activity by an organization (an energy service provider) to a *user* (3.50) or consumer to provide energy services in the best way, such as offering incentives for energy efficient air conditioning systems or financing for consumer-provided solar energy generating systems.

3.14
energy service provider
energy entity or person that provides *service* (3.44) to a retail or end-use customer

3.15
energy services
activities and their results related to the provision and/or use of energy

Note 1 to entry: In this document, the term "energy services" (plural) refers to generic activities or energy uses such as heating or lighting or supply of natural gas, whereas the term "*energy service* (3.13)" (singular) is used to refer to the activity by an organization (an energy service provider) to a *user* (3.50) or consumer to provide energy services in the best way, such as offering incentives for energy efficient air conditioning systems or financing for consumer-provided solar energy generating systems.

[SOURCE: ISO 50001:2011, 3.16, modified — Note 1 to entry has been added.]

3.16
energy supply
delivery of energy to consumers

3.17
environment
surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelationships

Note 1 to entry: Surroundings can extend from within an organization to the local, regional and global system.

Note 2 to entry: Surroundings can be described in terms of biodiversity, ecosystems, climate or other characteristics.

Note 3 to entry: For the application of this document, environment is considered as a specific *stakeholder* (3.47). The interests of this specific stakeholder can be represented by relevant authorities, by the communities or by other groups, such as NGOs.

[SOURCE: ISO 14001:2015, 3.2.1, modified – Note 3 to entry has been added]

3.18
indicator
parameter, or value derived from parameters, which provides information about a subject matter with a significance extending beyond that directly associated with a parameter value

Note 1 to entry: Indicators can refer to context, conditions, means, activities or *performance* (3.26).

3.19
infrastructure
system of fixed *assets* (3.2) needed for the operation of an *energy service* (3.13)

Note 1 to entry: Infrastructure can be tangible (e.g. transformers) or intangible (software systems).

Note 2 to entry: Infrastructure can also be necessary for the energy service to use technical equipment for transport which is not fixed (e.g. trucks, vans, bottles of LPG, kerosene drums) on a permanent or occasional basis, or in emergency situations. The term "infrastructure" is used primarily for fixed equipment and installations.

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[SOURCE: ISO 9000:2015, 3.5.2, modified – The words "facilities, equipment and services needed for the operation of an organization" have been replaced by the words "fixed assets needed for the operation of an energy service" in the definition, and the Notes to entry have been added.]

3.20
interruption
situation where *energy supply* (3.16) is not available

Note 1 to entry: Interruptions can be planned or unplanned.

3.21
maintenance
combination of all technical, administrative and managerial actions during the life cycle of an *asset* (3.2), intended to retain it in, or restore it to, a state in which it can perform the required function

3.22
management
coordinated activities to direct and control an organization

Note 1 to entry: Management can include establishing policies and objectives, and *processes* (3.31) to achieve these objectives.

Note 2 to entry: The word "management" sometimes refers to people, i.e. a person or group of people with authority and responsibility for the conduct and control of an organization. When "management" is used in this sense, it should always be used with some form of qualifier to avoid confusion with the concept of "management" as a set of activities defined above. For example, "management shall…" is deprecated whereas "top management shall…" is acceptable. Otherwise different words should be adopted to convey the concept when related to people, e.g. managerial or managers.

Note 3 to entry: The term "management" can be qualified by a specific domain it addresses.

EXAMPLE Public health management; environmental management; risk management.

[SOURCE: ISO 9000:2015, 3.3.3, modified — Note 3 to entry and the Example have been added.]

3.23
management system
set of interrelated or interacting elements of an organization to establish policies and objectives, and *processes* (3.31) to achieve those objectives

Note 1 to entry: A management system of an *energy service* (3.13) can include different management systems, such as a quality management system, an energy performance management system, a financial management system or an environmental management system.

[SOURCE: ISO 9000:2015, 3.5.3, modified — Original Notes to entry have been deleted and Note 1 to entry has been added.]

3.24
on-site system
set of physical *assets* (3.2) necessary for supplying energy or fuel, with or without physical *connection* (3.8) to centralized installations from an *energy service* (3.13)

3.25
operator
person or organization performing day-to-day *processes* (3.31) and activities necessary for the provision of the *energy service* (3.13)

Note 1 to entry: There can be one or several operators for a given energy service, e.g. distinct operators for installations operation, safety checking, *billing* (3.5) and recovering payments. Accordingly, "operator" as used in this document can be singular or plural as the context in this document or the actual application indicate. The mission of an operator is determined by the *responsible body* (3.42). An operator can subcontract some of its operations to other contractors, if allowed by the responsible body.

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Note 2 to entry: An operator can be public or private, and can be distinct from the responsible body or not. Examples where the responsible body and the operator are not distinct include a technical department in a municipality, a company, a small contractor, an NGO and a cooperative.

Note 3 to entry: In the context of this document, an "operator" is not a person employed within an organization to operate a piece of equipment or process.

3.26
performance
achievements of an activity, a *process* (3.31) or an organization

3.27
point-of-delivery
location of meters for the provision of the *energy service* (3.13)

EXAMPLE A connection box, a meter, the limit boundary between public and private property.

Note 1 to entry: The point-of-delivery is generally defined in the energy *service agreement* (3.45).

Note 2 to entry: In general, *energy service provider* (3.14) employees cannot obtain direct physical access to the installations beyond the point-of-delivery without the permission of the customer.

Note 3 to entry: In the case of non-metered systems (e.g. in some district heating schemes), the point of delivery can be the same as the *point-of-use* (3.28).

3.28
point-of-use
physically fixed interface where the *user* (3.50) normally takes the energy supplied for the intended use

EXAMPLE A gas tap; a mains switch.

Note 1 to entry: The point-of-use can be in private or public property.

Note 2 to entry: The point-of-use can be the same as the *point-of-delivery* (3.27), e.g. in the case of a combined meter and mains switch.

3.29
price
counterpart in money or alike paid for the supply or provision of a product or *service* (3.44)

Note 1 to entry: When relevant, price is expressed relating to a unit of product or service.

EXAMPLE Price of a cubic metre of gas; price of a kilowatt hour of electricity; price of a *connection* (3.8).

3.30
procedure
specified way of carrying out an activity or a *process* (3.31)

Note 1 to entry: Procedures can be documented or undocumented.

3.31
process
set of interrelated or interacting activities that use inputs to deliver an intended result

[SOURCE: ISO 9000:2015, 3.4.1, modified — Notes to entry have been deleted.]

3.32
quality
degree to which a set of inherent characteristics of an object fulfils *requirements* (3.41)

[SOURCE: ISO 9000:2015, 3.6.2, modified — Notes to entry have been deleted.]

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3.33
rate of return
financial benefits from an investment, considering interest, as quantified using metrics such as internal rate of return, return on investment, net present value, or discounted cash flow analysis

Note 1 to entry: The time period of measurement can be annual or over the lifetime of the investment.

3.34
registered user
customer or *user* (3.50) for whom relevant information is recorded by the *responsible body* (3.42) or *operator* (3.25)

Note 1 to entry: In this definition, the term "customer" is considered to be synonymous with the term "user" in view of the fact that a customer has a commercial relationship, e.g. an *energy service* (3.13) agreement, with the *energy service provider* (3.14). The term "customer" is currently used in such expressions as "customer relations".

3.35
rehabilitation
operation on an *infrastructure* (3.19) that restores it to a defined level, or improves it to a higher level of *performance* (3.26)

3.36
relevant authority
public body entitled to set general policies, plans or *requirements* (3.41), or to check compliance with these rules, concerning all the *energy service providers* (3.14) included in its area of jurisdiction

EXAMPLE National, regional or local governments, public agencies, regulators.

Note 1 to entry: For a given energy service provider, there can be several relevant authorities, which have jurisdiction in different domains.

3.37
reliability
degree of confidence in the information for representing or for qualifying the relevant subject matter

Note 1 to entry: Information can be data, *indicators* (3.18) or estimations.

Note 2 to entry: When referring to a device, "reliability" means the probability that a device, system, or *process* (3.31) will perform its prescribed function without failure for a given time when operated correctly in a specified *environment* (3.17).

3.38
renewable energy
energy not depleted by extraction as it is naturally replenished at a rate faster than it is extracted

Note 1 to entry: Renewable energy excludes recovered or wasted energy.

Note 2 to entry: Organic fraction of municipal waste can be considered as a renewable energy.

Note 3 to entry: Whether the energy stored in a technical system is renewable or not depends upon the nature of the original energy.

Note 4 to entry: Criteria to categorize an energy as renewable can differ amongst jurisdictions, based on local environmental or other reasons.

[SOURCE: ISO/IEC 13273-2:2015, 3.1.5, modified — The term "renewable energy source" has been replaced by "renewable energy"; the word "source" has been deleted after "energy" in the definition and in each of the Notes to entry; the verb "may" has been replaced by "can" in Note 2 to entry. The term "renewable energy" is defined differently in ISO/IEC 13273-2:2015, 3.1.6.]

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