



CEA Guideline for the Selection and Use of **SMART GRID** Standards

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Canadian
Electricity
Association

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canadienne
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PREFACE



Electricity system standards are technical blueprints, necessary for interoperability and connectivity. Further to this, technical standardization of the electricity system has significant public interest implications with respect to safety, welfare, trade, economic growth, competitiveness, and cost.

With the changing regulatory environment of the electricity industry in Canada, North America and internationally, greater reliance has been placed on recognized international, regional and national standards related to electrical system safety, reliability, compatibility, efficiency, cost-effectiveness, and performance to ensure due diligence on the part of electric utilities.

The six main priority areas of the Canadian Electricity Association (CEA) membership are infrastructure, energy efficiency, technology, regulation, environment and security. Modernizing the electricity system, in particular the Smart Grid, in support of this series of strategic goals requires understanding, recognizing, anticipating and outwardly-addressing the process of standardization with respect to both shorter- and longer-term opportunities and challenges.

The CEA Smart Grid Standards Task Group, operating under the Standards Management Committee that reports to the CEA Board of Directors, has developed this shared framework to guide end-users (e.g. electric utilities) in selecting standards that aim to transform aging electric utility system infrastructure without lessening the reliability, safety and efficiency of the Canadian electric utility system.

1 SCOPE

The following fifteen elective criteria under the below eight fundamental principles are intended to provide end-users, e.g. electric utilities, guidance in selecting standards that are deemed relevant to modernizing the electricity grid and mitigating the resulting risks and/or impacts to the reliability and quality of the electricity service to consumers.

The principles and criteria have been ordered by significance and therefore this document should be seen as a checklist for selection.

NOTE: The guiding principles and selection criteria are intended to include both product and system standards that concern either *electricity flow in use* or *data exchange*.

“Electricity flow in use” is defined as the *movement of electrons*. In the context of standards, the term refers to documents that provide requirements, guidelines, specifications and/or characteristics for products or systems that have capacity or capability to manage the physical flow of electricity.

“Data exchange”, in contrast, refers to the *movement of information*. In the context of standards, the term denotes documents that provide requirements, guidelines, specifications, protocols and/or characteristics for products or systems that have the capacity and capability to send, receive, and process information.

2 GUIDING PRINCIPLES



2.1 Applicability

- 2.1.1 Preference is given to standards that are both practicable and have a suitable purpose that favours local variables. These variables include current and intended generation mix, customer base, geographic profile and any additional evaluation factor deemed necessary to consider by the end-user as a means to mitigate any adverse system reliability impacts with implementation of the standard.
- 2.1.2 Preference is given to standards that demonstrate a net benefit based upon an end-user evaluation. The end-user evaluation should include an analysis on customer buy-in of the standardized technologies to be integrated in the system, analysis of both reliability and quality of electricity service metrics, and a cost-effectiveness analysis.

2.2 Interoperability

- 2.2.1 Preference is given to standards that do not require any modified or altered integrations, information exchange or otherwise. It is preferable to have product or system interfaces for which the integration, present or future, is without any implementable restrictions.

2.3 Openness

- 2.3.1 Preference is given to standards that are established by consensus, rather than by a proprietary source, and approved by a recognized body (and in compliance with governing standards development procedures).
- 2.3.2 Preference is given to standards where the requirements, guidelines, or specifications therein are reached through a balanced representation of interests rather than by exclusive domination or control of a single representative interest or a single categorical interest, e.g. manufacturer, user, and regulator.

- 2.3.3 Preference is given to standards of an established national or international consensus-based standards development origin.

2.4 Maturity/Stability

- 2.4.1 Preference is given to standards with wide market support and that have both identifiable and quantifiable potential for sustainable value delivery. The measurable potential is to have been demonstrated by experience of use elsewhere, whether through research and development, pilots and/or demonstration projects.

2.5 Implementability

- 2.5.1 Preference is given to standards in which the technologies are in compliance (see Compliance) to said selected standard and are marketed and commercially available.

NOTE: End-users should avoid high degrees of customization to any implemented technologies.

- 2.5.2 Preference is given to standards in which commercial products implementations for multiple vendors, in accordance with Criterion 14, can be demonstrated, authenticated and verified prior to end-user commitment to said configuration or standard.
- 2.5.3 Preference is given to standards that are free from intellectual property rights or patents, and are without any royalties or other related encumbrances, e.g. cost of the product or system standard.

2.6 Compatibility/Interchangeability

- 2.6.1 Preference is given to standards that support legacy standards and thereby legacy equipment and devices, whether a smart grid technology or otherwise.



- 2.6.2 Preference is given to standards that foster the ability to be both backward and forward compatible; this preferred ability is inclusive of the adhering technologies to said standards. This as a result avoids stranded electricity assets and mitigates risks associated with product procurement, standards selection and obsolesces.

NOTE: For standards, backward and forward compatibility refers to permitting mutual substitutions, e.g. new editions or old editions, with the capacity for past, present or future equipment or devices, smart grid technologies or otherwise, to operate without having to modify or alter the integration of the standard.

2.7 Compliance

- 2.7.1 Preference is given to standards in which the products or systems perform in accordance with the requirements of the selected standard and are verifiable by an end-user via a conformity schema as deemed appropriate by the end-user, e.g. first-party, second-party or third party conformity.
- 2.7.2 Preference is given to standards that include interoperability testing requirements for single- or multi-vendor product combinations that can be tested and verified to be in conformance with the requirements of the selected standard by an end-user via an appropriate conformity schema.

2.8 Availability

- 2.8.1 Preference is given to standards that are irrevocably accessible and publicly available.

About the Canadian Electricity Association

Canadian Electricity Association (CEA) members generate, transmit and distribute electrical energy to industrial, commercial, residential and institutional customers across Canada every day. From vertically integrated electric utilities, to power marketers, to the manufacturers and suppliers of materials, technology and services that keep the industry running smoothly—all are represented by this national industry association. Participation in *Sustainable Electricity* is a condition of CEA membership. Visit www.electricity.ca.

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