Guide for IEEE Standards for Policy Makers

The stakeholder breadth and technical expertise represented within IEEE is unique in the world. IEEE counts among its over 400,000 members and additional participants not only industry, but also academics, researchers, government employees, and thought leaders in all relevant technology-related disciplines. This broad expertise was recently leveraged to bring diverse communities together for new work in the ethics and autonomous and intelligent systems space, where ethicists, policy makers, and others have joined the technical community to address multi-faceted questions from different perspectives.

IEEE standards are integral to modern infrastructure. Communications networks are one example: It is estimated that 98% of all internet traffic crosses an IEEE 802 standard-based network, some of the most well-known examples being IEEE 802.3 (Ethernet™) and IEEE 802.11 (Wi-Fi™) networks. IEEE standards are critical instruments supporting innovation and international trade, protecting consumers, and addressing societal challenges and other public imperatives.

This guide aims to help public policymakers understand the benefits of using IEEE standards to support public policy initiatives. In publishing this guide, the IEEE Standards Association (IEEE SA) is offering to assist policymakers who wish to use IEEE's standards to support their work and invites policymakers to participate in the IEEE Government Engagement Program on Standards (GEPS).

How do IEEE standards provide value for policymakers?

IEEE standards can be powerful instruments for government. IEEE standards are global in nature and developed in an inclusive and transparent manner, leveraging the expertise of the global IEEE community from more than 160 countries from all continents; their use is voluntary unless mandated by a regulatory authority. IEEE standards benefit the public sector by:

- Supporting international trade and productivity;
- Decreasing the cost of goods and services by creating economies of scale;
- Encouraging interoperability, increasing consumer choice, and avoiding vendor lock-in;
- Leveling the technology playing field and enabling innovation by all stakeholders, including large, medium, and small companies;
- Protecting workers, citizens, and communities from low quality products and services;
- Providing incentives for public imperatives, such as environmental protection and social responsibility;
- Reflecting the expertise of IEEE's large global technical community;
- Facilitating the ability to keep pace with current technology;
- Eliminating costs of developing in-house standards, both due to need of expertise and development costs.

IEEE standards can be used to support the implementation of public policy, including through legislative action and regulations. They can also provide support outside of those formal processes by:

- Creating incentive systems to follow internationally accepted practices by fostering competition, leading to price reductions and economic growth;
- Helping to align public procurement systems with international best practice;
- Reducing technical barriers to trade by adhering to WTO principles: the code of good practice for the preparation, adoption and application of standards.

How Can the Public Sector Leverage IEEE Standards?

The breadth of IEEE standards ranges from the physical layer communication standards that underpin the Internet of Things (IoT) and digital transformation, such as Wi-Fi™, Ethernet™, and Zigbee™, to standards covering energy infrastructure, transportation, healthcare, and nuclear safety. Some examples of how governmental bodies around the world have leveraged IEEE standards include:

- Various national and sub-national governments are using the EPEAT™ program[1], based on the IEEE 1680™ standards for the environmental assessment of electronics, which serves as the basis for government procurement, to develop purchasing specifications in line with environmental goals. EPEAT covers over 40 countries and enables purchasers worldwide to use it as a uniform specification, thus simplifying the procurement process, and sending a consistent signal to manufacturers to create "greener" products by comparing products and making informed purchasing decisions.[2]

- The IEEE 802.15.4 standard is the basis for ZigBee Smart Energy, an application standard that enables wireless communication between energy service providers, utilities and household devices, e.g. smart thermostats and appliances. It also helps utilities and energy providers implement new advanced metering and demand response programs to drive greater energy management and efficiency, while responding to changing government requirements. In the UK, the government expects to deploy smart meters to every home by 2020, and has chosen Zigbee, as it reliably addresses the smart energy technical functionality needs and is already a proven solution that is adaptable and easy to implement on an enormous scale.

- In India, the Government, along with industry stakeholders, have been working to create an ecosystem for interoperable solutions using IEEE 802.15.4u because the standard will enable the Internet of Things (IoT) and smart city applications that would not be financially viable with other wireless or wired technologies.

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[1]   https://www.epeat.net/wp-content/uploads/2013/10/EPEAT_Intl-Govt_One-Pager.pdf
[2]   https://www.epeat.net/participants/purchasers/governments/

- In the European Union, the importance of wireless local area networks (often referred to as Wi-Fi®) has been recognized through *WiFi4EU*, an EU funded scheme (EUR 120 million for 2017-2019) supporting the installation of Wi-Fi equipment, based on IEEE 802.11™ standards, in a geographically balanced manner in the centers of community life. It is estimated that citizens and visitors in 6,000 to 8,000 European communities will be able to benefit from free Wi-Fi's high-speed connectivity in European public spaces by 2020.[3]

- In the United States of America, the U.S. National Institute of Standards and Technology (NIST) found that engaging in IEEE standardization activities on wireless communications (IEEE 802.11) and medical device communications (IEEE 11073™) helped achieve its goal of more broadly disseminating its research. IEEE standards can be an instrument for getting research findings and technology into the broader ecosystem and help build global markets.

- In Denmark, the government adopted guidelines referencing the IEEE Standard 11073™ Personal Health Devices family of standards as a framework for personal connected health interoperability. This helped policymakers address eHealth system fragmentation, which hampered quality service, and the IEEE standards serve as a basis for interoperability for health device communications protocols.

- To help utilities in India meet the country's Electricity Act, the Ministry of Power (Central Electricity Authority [CEA] of India) references IEEE Std 80™-2013, IEEE Guide for Safety in AC Substation Grounding in its safety regulations regarding substation grounding, including the safety of people involved and the proper functioning of the substation equipment. Also referenced is IEEE Std 519™-2014, IEEE Recommended Practice and Requirements for Harmonic Control in Electric Power Systems in the regulation for distributed generation resources.

The IEEE Government Engagement Program on Standards (GEPS)

IEEE SA invites governments to participate in the IEEE Government Engagement Program on Standards (GEPS), where they will get to know and help shape IEEE standards-related programs and services, inform standardization's direction, and share views with technology experts globally.

The program strives to:

- Increase governments' understanding of the IEEE model of bottom-up driven, globally open development of standards ,
- Facilitate a fruitful information exchange between government representatives about standards-related priorities and IEEE SA's key initiatives,

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[3] https://ec.europa.eu/digital-single-market /en/policies/wifi4eu-free-wi-fi-europeans

- Promote engagement with countries from around the world to receive global perspectives.

Through GEPS, government entities, via their appointed representatives, have an easy entry point into IEEE SA and its activities, and will be able to engage with IEEE SA in-person and online through a variety of web-based tools and email communications. Appointed representatives have access to substantive meeting materials of the IEEE SA Standards Board (IEEE SASB), allowing them to actively contribute to the discussions on IEEE standardization activities and processes. Appointed representatives are also welcome to discuss their views during topical interactive live webinars or in regular exchange with IEEE SA staff and other experts.

Through GEPS, appointed representatives will have access to:

- An orientation webinar to familiarize representatives with IEEE SA and GEPS,
- Webinars on topics of relevance to governments,
- Newsletters,
- An IEEE SA staff contact person to assist with program participation,
- The opportunity for the appointed representative to participate in the IEEE SASB meeting series – especially encouraged when the Standards Board meets in the appointed representative's country – to see first-hand how the IEEE standards process works and to exchange views,
- The opportunity to provide informational reports to the IEEE SASB upon request.

Getting Involved in IEEE's Global Standards Development Process

Governments can rely on the IEEE standards development process as it is proven, established, and nimble. It is characterized by due process, openness, consensus, balance, and the right to appeal. IEEE standards are available for implementation by anyone.

There are two paths of standards development in IEEE:

Individual Method:

- Participants are individual technical experts
- Individuals represent themselves
- Each individual participant has 1 vote
- Ballot groups are made up of a minimum of 10 individuals
- Ballot group participants must be IEEE-SA individual members

Entity Method:

- Participants are "legal entities," i.e., companies, universities, government bodies, etc.
- Designated representative and alternate representative for the entity
- Entity sends representatives to meetings

- Each entity has one vote
- Requires a minimum of 3 IEEE SA corporate member entities

A variety of interested stakeholders is actively engaged in IEEE's standards development activities, which are coordinated and overseen by the IEEE SASB.

Individuals employed by government agencies can and do participate in the IEEE individual method standards development process. Government agencies can become IEEE SA entity members to participate in the development of IEEE entity method standards.

IEEE standards provide a means for technological development to reach the global marketplace. IEEE standards are known for achieving high levels of technical excellence and broad applicability.

If you would like to get involved in the IEEE standards development process, please visit: https://standards.ieee.org/getinvolved/.

About IEEE and IEEE SA

IEEE is the world's largest professional association with the mission of advancing technology for humanity. **IEEE SA** is a leading consensus-building organization within IEEE that nurtures, develops, and advances global technologies through facilitation of standards development and collaboration.

The IEEE standards community is comprised of technical experts and thought leaders from around the world, coming from industry, academia, research organizations, governments, and civil society organizations.

IEEE SA facts and figures

- Globally-implemented standards
- 1,100+ active standards
- 850+ standards under development
- More than 7,000 individual members, more than 20,000 standards developers from every continent
- 285+ entity members

The full portfolio of IEEE standards can be accessed at: http://standards.ieee.org/findstds/.

Policymakers are invited to participate in the IEEE standards process in whichever way is most beneficial and complimentary to their priorities. Involvement can range from basic information exchange to participating in GEPS at the tri-annual IEEE SASB meetings.

For more information on the use of IEEE standards to support public policy and about GEPS, please contact Constance Weise, IEEE GEPS Team.

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