



Metrology, standardization and conformity assessment



Building an infrastructure for sustainable development

Metrology, standardization and conformity assessment are used by business and government to optimize production, health, consumer protection, environment, security and quality. Their effective implementation supports sustainable development and social welfare, and facilitates trade.

Three pillars of sustainable development : metrology, standardization and conformity assessment

Every country needs a sound infrastructure to achieve its societal goals. At the most basic level, this means providing a plentiful supply of clean water and shelter. It means adequate internal transportation links, provision of healthcare and an accessible education system. Beyond the basics, all societies wish to garner the benefits of the wider world of international trade. At the same time, they wish to be part of initiatives such as the United Nations Millennium Development Goals.

As a result, there is an increasing awareness of the need to discuss, compare and improve infrastructures in the context of global economic efficiency, and market access for goods and services for both developed and developing countries. This is where metrology, standardization and conformity assessment come in. They are the pillars of knowledge for developing a technical infrastructure, and thereby enabling sustainable development and full participation in international trade. And they are firmly linked together.



The metrology pillar

Metrology includes work by national measurement institutes and international treaties such as the **Metre Convention** – which gives authority to the International Committee for Weights and Measures (CIPM) and the International Bureau of Weights and Measures (BIPM) to act on measurement standards of ever-increasing accuracy, range and diversity. There is a need to demonstrate equivalence between national measurement standards.

The CIPM Mutual Recognition Arrangement provides governments and other parties with a secure technical foundation for wider agreements related to international trade, commerce and regulatory affairs. It helps to eliminate technical barriers to trade and instill greater confidence in the measurement capabilities of individual countries. The result is billions of dollars of increased trade.

Legal metrology is coordinated by the International Organization of Legal Metrology (OIML). Legal metrology specifications are produced within the OIML and are adopted in all countries. The OIML also provides other valuable services such as a model law on metrology that can be used in setting up national technical infrastructure.



The standardization pillar

International standards and their use in technical regulations on products, production methods and services play a vital role in sustainable development and trade facilitation – through the promotion of safety, quality and compatibility. The benefits derived are significant. Standardization contributes not only to international trade but also to the basic infrastructure that underpins society, including health and environment, while promoting sustainability and good regulatory practice.

The leading organizations that produce International Standards are ISO, IEC and ITU. The scope of ISO covers standardization in all fields except electrical and electronic engineering, which are the responsibility of the IEC, and telecommunications covered by the ITU. The three organizations have a strong collaboration on standardization in the field of information technology.

International standards, or national or regional adoptions of international standards, help domestic markets to operate effectively, increase competitiveness and provide an excellent source of technology transfer to developing countries. They play an integral role in the protection of consumers and the environment.

Developing countries face many trade-related standardization challenges. They require access to standardization infrastructure to engage in the global trading system. With the increasing globalization of markets, international standards (as opposed to regional or national standards) have become critical to the trading process, ensuring a level playing field for exports, and ensuring imports meet internationally recognized levels of performance and safety.

Standards can be broadly sub-divided into three categories: **product, process** and **management systems**. Product refers to the quality and safety of goods or services. Process refers to the conditions under which products and services are to be produced, packaged or refined. Management system standards help organizations to manage their operations. They are often used to create a framework within which an organization consistently achieves the requirements set out in product and process standards.

The World Trade Organization Agreement on Technical Barriers to Trade (WTO/TBT) recognizes the contribution that international standardization can make to the transfer of technology from developed to developing countries, and the role of international standards and conformity assessment systems in improving the efficiency of production and in facilitating international trade.



The conformity assessment pillar

Conformity assessment plays a critical role in building confidence for sustainable development and trade.

International Standard ISO/IEC 17000 defines conformity assessment as a “demonstration that specified requirements relating to a product, process, system, person or body are fulfilled.”

Conformity assessment procedures, such as testing, inspection and certification, offer assurance that products fulfil the requirements specified in regulations and standards.

Conformity assessment is specific to the object being assessed – it can be a product, a process or a management system – and to the body undertaking the assessment. For example, it may be the **first party**, such as the manufacturer of a product, which is making a supplier’s declaration of conformity using its own internal testing system *or* a **third-party** certification or inspection, undertaken by an independent service provider. The service provider could be a government agency or a private company.

Each organization must decide which type of conformity assessment is necessary for which purpose. One of the crucial decisions is whether to make conformity assessment mandatory through *government regulations* in specific sectors, or whether to rely on the market to determine in a voluntary manner the conformity assessment requirements within normal transactions between buyers and sellers.

This decision should be based on an assessment of the **risks** involved with a particular product or process, and on an understanding of the impact the associated costs and benefits will have on achieving sustainable development.

Successive reviews of the WTO/TBT Agreement have noted the usefulness of ISO/IEC conformity assessment standards and guides in harmonizing conformity assessment practice and as benchmarks for the technical competence of assessment bodies, thus enhancing credibility and confidence in their results. ISO/IEC’s conformity assessment work therefore helps to overcome technical trade barriers.

Accreditation is the “third-party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks” (ISO/IEC 17000). Establishing accreditation systems based on international standards and guides and linked with membership of the ILAC and/or IAF mutual recognition arrangements can help provide assurance to trading partners that suppliers of tests and certificates are competent. At the same time it helps in overcoming technical trade barriers and in complying with the requirements of the WTO/TBT Agreement.

Building capacity

The **three pillars** described above are interdependent. Metrology and physical standards provide the basis for accurate measurements, the accepted performance of which can then be written in international standards, which can in turn be used as the basis for conformity assessment.

But it is recognized that for many countries the cost of providing all these activities at their most advanced level is prohibitive. Even in the case of developed countries there are variations in the sophistication of each part of the technical infrastructure. In many cases some parts of the infrastructure may be jointly owned or shared by one or more countries. Sometimes, the services of another country are relied upon altogether.

It is important for sustainable development and trade to ensure that societies and industries in developing countries have access to a technical infrastructure that reflects specific needs.



Any capacity-building efforts should be based on :

- a thorough needs assessment for all parts of the economy;
- the understanding that there is no ready-made model for technical infrastructure. Developing countries themselves must make policy decisions and provide an ongoing political commitment to those decisions;
- careful consideration of the assessed needs, based on the type and appropriate sequencing of assistance, to ensure the technical infrastructure is built in a sustainable and planned manner;
- a clear articulation of the resources and finance that will be required to sustain the necessary technical infrastructure; and
- the fact that the development of a national technical infrastructure should not preclude consideration of bilateral or regional service delivery options that may achieve better economies of scale.

The **three pillars** are vital for everyone. Provision of assistance aimed at strengthening the technical infrastructures of developing countries is necessary for sustainable development, and to enable developing countries to effectively participate in global trading.

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- International Organization for Standardization (**ISO**)
- International Trade Centre UNCTAD/WTO (**ITC**)
- Telecommunication Standardization Bureau of ITU (**ITU**)
- International Organization of Legal Metrology (**OIML**)
- United Nations Industrial Development Organization (**UNIDO**)



ISO Central Secretariat

International Organization for Standardization
1, rue de Varembé, Case postale 56
CH-1211 Genève 20, Switzerland

Tel. + 41 22 749 01 11
Fax + 41 22 733 34 30
E-mail central@iso.org
Web www.iso.org