

METROLOGY FOR SUSTAINABLE DEVELOPMENT

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1. BASIC INFORMATION

In the past two decades Sustainable Development has been the subject of an enormous number of studies, reports and actions. The figure of 202.000.000 entries in the Google search procedure demonstrate the worldwide attention given to this subject.

In 1987, the World Commission on Environment and Development (WCED), which had been set up in 1983, published a report entitled “Our common future”. The document came to be known as the “Brundtland Report” after the Commission's chairwoman, Gro Harlem Brundtland[1]. It developed guiding principles for sustainable development as it is generally understood today.

The Brundtland Report stated that critical global environmental problems were primarily the result of the enormous poverty of the South and the non-sustainable patterns of consumption and production in the North. It called for a strategy that united development and the environment – described by the now-common term “sustainable development”. Sustainable development is defined as follows: Sustainable development is defined as follows: **“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”** In 1989, the report was debated in the UN General Assembly, which decided to organize a UN Conference on Environment and Development.[2]

The axis of Sustainable Development is based in the interdependence of environmental, economic and social systems to promote equality and justice through people empowerment and a sense of global citizenship.

The environment is our life support system. It includes everything that we rely on during our lifetime such as air, water, metals, soil, rock and other living organisms. It is well known that the state of our environment is influenced by our behaviour and that we have the need to preserve it from degradation[3]. Sustainable Development does not just mean a cleaner environment; it also requires a stable and healthy economy. To deliver a more sustainable economy we need to do more with less by making better use of resources, increase investment, promote stability and competition, develop skills and reward work. Sustainable development requires us to take a long term view of the economy, rather than adopting short term fixes [3].

Sustainable Development implies that environmental and economics are key players in the search for a sense of social cohesion, cultural inclusion and people empowerment, to improve the places where people live and work, giving the society the chance to play its part in shaping the future[3].

If it is considered that the axis of Sustainable Development is based in the interdependence of environmental, economic and social systems a fundamental requirement to establish the adequate parameters to evaluate the effectiveness of actions on Sustainable Development is the knowledge of the environmental, economical and social conditions and their evolution in time and space. This implies the act of measuring the different variables involved in systems under observation.

It is here that metrology plays a fundamental role in Sustainable Development. According to the International Vocabulary of Metrology, **“Metrology is the science of measurement associated to its uncertainty.”**

Although often unseen and beyond our awareness metrology drives and underpins much of what we do and experience in our everyday lives. It is present in a variety of areas such as agriculture, health, transport, security, communications, energy, trade, industry, environment, science, technology and innovation.

Being environment one of the axis of Sustainable Development, in this lecture it is discussed the importance of metrology for monitoring the environmental conditions focusing in its role to a better comprehension of the global warming phenomena. The presentation also discuss the impact of metrology in the economy of the world through sustainable industrial policy. Sustainable industrial policy is at the heart of development strategies, and encompasses a variety of interrelated economic, social and environmental objectives, such as the encouragement of an open, competitive economy through the adoption of appropriate industrial and trade policies, including the progressive liberalization of international and regional trade, within a stable enabling economic and social environment and protection of the natural environment through the efficient use of renewable and nonrenewable resources. Here technological innovation, research and development activities plays a crucial role that are crucial for economic and social development of any country. The World Bank Report of 2005 states that “knowledge is the central element of a new economic structure. Learning is its most

important process and Innovation is the main tool to transform knowledge in economic value, lead to developed nations and a group of developing nations to adopt actions including Science, Technology and Innovation in the center of their political and economical agenda". The strong interrelation of metrology with science, technology and innovation from the far past is discussed using the Ahmed, or Rhind, papyrus as an example and the present through the example of the atomic fountain clocks and the GPS. It is also commented some new challenges and perspectives for metrology arising from nanoscience, nanotechnology.

Finally some challenges and actions to establish an agenda for Metrology for Sustainable Development are suggested.

REFERENCES

- [1] United Nations General Assembly, 42ndSection, August 4, 1987.
- [2] Federal Office for Spatial Development (ARE), CH-3003 Berne, 12.07.2004.
- [3] Encyclopedia of Sustainable Development.