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Improving the relevance and impact of international standards for global climate change mitigation and increased energy access

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ABSTRACT

Substantial international cooperation will be required to meet the challenges of the 2015 Paris Agreement on Climate change and UN 2030 Sustainability Goals. International standards can be an important tool for providing structure and guidance in rapidly evolving energy efficiency (EE) and renewable energy (RE) markets, thus improving their positive effect on global climate and energy access goals.

This paper presents the key findings and detailed analysis from a 2014 survey of 378 standards developers and policy makers in 37 countries conducted by the International Organization for Standardization's (ISO) Strategic Advisory Group on Energy Efficiency and Renewable Energy Sources. This survey represents the first large effort by ISO to systematically seek external input in mapping policy and standardization needs in EE and RE markets.

The survey identified eight key findings, most notably a disconnect between policy makers and standards developers as a potential barrier to developing effective and relevant standards. Specific steps are described to support greater engagement of policy makers during the early stages of standards development and improve standard making outcomes. Greater dialogue and better coordination is needed among standards, as well as between standards and related policies in order to achieve this potential and to make positive contributions to the broader goals of policy cohesion.

1. Introduction

Improved utilization of conventional energy sources and increased use of renewable energy sources are urgently needed to address climate and poverty reduction goals. The December 2015 Paris Agreement by 195 countries participating in the United Nations (UN) Framework Convention on Climate Change COP21:

> notes that much greater emission reduction efforts will be required than those associated with the intended nationally determined contributions in order to hold the increase in the global average temperature to below 2 °C above pre-industrial levels by reducing emissions to 40 gigatonnes or to 1.5 °C above pre-industrial levels.[1]

As of November 2016, the Paris Agreement entered into force following attainment of the ratification threshold by 119 of the participating parties. Since energy consumption from fossil fuels is the greatest contributor to greenhouse (GHG) emissions, the scaling up of energy efficiency (EE) and renewable energy (RE) is crucial toward meeting the emission reduction goals of the Agreement.

Additionally, the United Nations Sustainable Development Goals or SDGs (United Nations, 2015) have established a much broader challenge – "an agenda of unprecedented scope and significance":

> We resolve, between now and 2030, to end poverty and hunger everywhere; to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure the lasting protection of the planet and its natural resources. We resolve also to create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all, taking into account different levels of national development and capacities.[2]

The UN 2030 Agenda for Sustainable Development (UN Agenda) is comprised of 17 goals and 169 targets, including the 7th Goal to "ensure

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[1] UN Framework Convention on Climate Change Conference of Parties, Twenty-first session; 12 December 2015. *Adoption of the Paris Agreement*, Section II, Article 17. Paris, France.

[2] UN General Assembly Resolution adopted 25 September 2015. *70/1. Transforming our world: the 2030 Agenda for Sustainable Development,* Declaration, Introduction, para 3. New York, New York.

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access to affordable, reliable, sustainable and modern energy for all". Since nearly 1.3 billion people, or 18% of the world's population, lack electricity – with security of energy supply an issue for many more (International Energy Agency (IEA), 2014) – this is a critical undertaking. Further, according to analysis by the International Resource Panel (United Nations Environment Programme (UNEP), 2015) "10 of the 17 Goals can be achieved only if consumption efficiencies for land, water, energy (fossil fuels and bio-fuels), materials and other finite resources are raised substantially." Progress to one goal may negatively impact another (e.g- redirecting potential food stocks for biofuel, increased use of energy for water conserving irrigation technologies). For these reasons, the UN Agenda emphasizes the need for "policy coherence" in addressing and linking progress on these goals.

Policy coherence challenges the concept of environmental improvement and economic growth as "trade-offs" and seeks a more synergistic approach. Assuming that the global population considered middle class will increase 250% by 2035, global resources will be inadequate to support them unless global consumption efficiencies are found (United Nations Environment Programme (UNEP), 2015). The availability of energy is known to be a prime driver for economic growth and poverty alleviation (IIASA GEA, 2012; Hussain, 2012),[3] but sustainability and efficiency of consumption and its impact on other resources, such as water, marine life, and air quality must also be considered for improved policy coherence (United Nations Environment Programme (UNEP), 2015).

This paper details some of the opportunities and challenges for engaging international standards as a mechanism in support of meeting these challenges. International standards provide a shared foundation for global trade, management processes, interoperability of equipment and systems, safety, environmental practices, and professional qualifications. More specifically, international energy-related standards have the potential to provide structure and guidance in rapidly evolving EE and RE markets, for the purpose of improving their positive effect on global climate and energy access goals. Unfortunately, the rapid proliferation of international standards in EE and RE has led to some unanticipated consequences, such as standardization around specific technical issues without sufficient regard to existing and emerging related standards, policy trends, applicability in the global context, and impact on policy coherence. For international energy-related standards to achieve their global potential, better coordination is needed among standards, as well as between standards and related policies.

In response to these concerns, the International Organization of Standards (ISO) established a Strategic Advisory Group on Energy Efficiency and Renewable Energy Sources (ISO SAG E) to study the problem and to report to the ISO Technical Management Board (ISO TMB) (ISO, 2014).[4] The ISO SAG E conducted a survey in 2014 of policymakers and standards developers as part of its brief to establish priority standards and actions in the areas of energy efficiency and renewable energy sources by developing a systematic long-term prioritization and coordination strategy that considers stakeholders interests.

This survey represented the first large effort by ISO to systematically seek input from parties external to the ISO technical committees to map policy and standardization needs in EE and RE.[5] Policymakers, representatives from international standards organizations and other key stakeholders engaged in activities in EE and RE were brought together to discuss how to improve, ensure and support the transition towards more sustainable energy systems.

During January and February 2014, ISO conducted an online survey that attracted responses from 378 standards developers and policy makers in 37 countries. The survey was divided into three parts: General, Energy Management and Bioenergy. For purposes of the survey, it is important to note that the term "energy management" was considered to include a full range of energy efficiency and demand response topics, and was not limited energy management systems (EnMS). The term "bioenergy" includes all types of energy from biological or biological bio-products and waste sources, whether a solid, liquid, or gas. These two topics were selected to pilot the survey concept as representative of the broader areas of energy efficiency and renewable energy. They were selected for two reasons: their importance in global climate change policy direction and the rapid development of standards and policies in these areas. Details of the methodology are described later in this paper.

1.1. Key findings

The key findings from the survey are listed below. These can be grouped into two general categories- the need for greater engagement between standards developers and policy makers and the need for improved relevance of developed standards.

1. Standardization provides confidence in policies and regulations. Effective standards that are suitable for referencing in legislation are especially important to those involved in both policy making and standards development;
2. A disconnect between policymakers and standards developers exists at several levels (from technical to senior management) that presents potential barriers to developing effective and relevant standards;
3. Responses by both policymakers and standards developers validate a need to increase their communication and respective awareness of major trends;
4. Standards development needs greater stakeholder engagement to attain balanced participation and an impartial perspective;
5. To achieve greater stakeholder engagement, significant barriers to participation in standards development need to be addressed, such as the cost of travel as well as time to participate in meetings and to review documents. Additional barriers include language and technical translation;
6. Improved workforce skills and qualifications are a priority for the bioenergy industry, but less so for energy management respondents, who identified other priorities such as organizational energy management and energy improvement opportunities;
7. Respondents placed high value on the availability of standard bioenergy contract templates but were often unaware of those already available, and
8. Bioenergy respondents viewed the three pillars of sustainability as mutually dependent, but either did not know, or were not convinced that standards developed in support of sustainability are balanced across these three pillars.[6]

Additional explanation and details for the key findings can be found in Section 4.

Since the survey findings were reported to ISO management in September 2014, ISO has taken some steps to address them. These are summarized later in this paper. It is important to note, however, that progress has been incremental and much more remains to be done to better align the policymaking and standards development communities.

[3] GEA Chapter 19 Energy Access for Development, Introduction " there is ample evidence that access to reliable, efficient, affordable, and safe energy carriers can directly affect productivity, income, and health, and can enhance gender equity, education, and access to other infrastructure services".

[4] ISO SAG E consisted of voluntary representatives put forward by their national standards bodies. For a list of representatives, see Acknowledgements.

[5] In 2013, ISO SAG E conducted a more limited internal survey of ISO technical committee leads that helped inform the broader survey but is not part of this paper.

[6] The three pillars of sustainability include balancing social, environmental and economic objectives so that the community is developed to provide good quality of life; resources are efficiently used and conserved; and economic growth is maintained. If one is missing, the system is unsustainable.