Standardization: an important tool in transforming biofuels into a commodity

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Presently the world is preoccupied with concerns of soaring oil prices, energy insecurity, and increasing challenges to minimize emissions of green house gases. All these issues certainly call for major reexamination of fossil energy based present technological paradigms and in favor of decisions on investments in clean energy, which supports sustainable development.

Many official documents show that the world has already acknowledged this shifting scenario, as investments in renewable energy have been growing on a steady trajectory. According to data presented by the United Nations, green energy overtook fossil fuels in attracting investment for power generation for the first time in 2008. The trend has been confirmed by the last report of UNEP, *Global Trends in Renewable Energy Investment 2011*, which states that in 2010 there has been a 32% rise in green energy investments worldwide.

In this context, the production of biofuels on a large scale has become a dominant focus for technical and political discussions all over the world, aimed at diversifying the energy mix of countries. Nations that are capable of innovating through sound investments and breakthrough achievements will enjoy tremendous advantages, both because these emerging technologies will support their

industrial expansion as well as the likelihood that high value-added exports can be generated.

The enthusiasm surrounding the biofuels sector has led many countries to introduce policies of offering subsidies to stimulate the production of bioethanol and biodiesel. To speed up their introduction in the energy portfolio, a growing number of governments have been requiring that biofuels be blended with fossil fuels. In USA, for instance, bioethanol blended with gasoline can contain as high as 85% bioethanol from corn (E85), or more usually other mixtures, such as E10 and E20. Similar to bioethanol, biodiesel mixtures are denominated “BXX,” X being the percentage of biodiesel, e.g., B2 means 2% of biodiesel, B5, 5%, up to B100. Brazil is the most traditional economy in the production of bioethanol from sugarcane, where the first governmental decree establishing a 5% blend of bioethanol with gasoline was issued in 1931. Since then, the composition has varied and nowadays is set up to around 20%, depending on the price of the fuels. Besides, in Brazil, it is possible to find vehicles that run solely on bioethanol. Moreover, the so-called flex-vehicles can run on any mixture of gasoline and bioethanol. The country has also been making sound investments for the production of biodiesel, aiming to reach a composition level of B8 in 2013.

More recently, the strategy of many producing countries, including Brazil, has moved to the forefront of turning biofuels into a full-fledged world commodity. Measures taken by some countries to protect domestic markets have been continually distorting international market of commodities for decades. Most evident and traditional measures have been related to tariffs and quotas, but other more subtle measures have been taken as well, such as subsidies to domestic producers and too harsh technical requirements.

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Although it is acknowledged that domestic standards, regulations and conformity assessment procedures improve production and promote international trade relations, the agreement on technical barriers to trade of the World Trade Organization also recognizes that they may act as unnecessary barriers to trade.

In the specific case of the biofuels sector, an astonishing lack of information can be observed and many times more rigorous specifications—as those that spring from regulations promulgated for alcohol for human consumption—are also demanded by importers of bioethanol. Another problem, concerning the lack of confidence in the analyses conducted by the laboratories involved in this task, must be emphasized.

A possible manner to overcome or reduce these obstacles is through the definition and implementation of worldwide harmonized technical standards for the product. The basis of the standardization process consists of measurement standards that concede confidence to the whole process.

These standards within the international system of metrology may serve as a reference for safety, quality, and compatibility, becoming pivotal instrument for international trade. While promoting good regulatory practices they may also contribute to the basic infrastructure of society, including health and environment.

The standardization process as a whole is based on the complementarities of three spheres, easily identified in any country, composed of: a regulatory agency—defining parameters and their limits—a technical standardization forum—establishing the necessary analytical methods—and a National Metrology Institute (NMI), providing guarantee and confidence on measurements.

A solid metrology infrastructure is the basis of the standardization process; without it, the analysis about the compliance with the requirements established by any regulatory system is impaired due to the nonexistence of a reference measurement standard that serves as comparison to effectively evaluate whether the result obtained in the analysis is compatible with the desired level.

In this direction, political and technical efforts started in July 2005 with the first visit of the former US President, George Bush, to Brazil, when a steady partnership on biofuels between the two countries started to evolve.

In 2007, this collaboration was reinforced, expressed through the signature of the “Memorandum of Understanding between the United States and Brazil to Advance Cooperation on Biofuels.” Also in 2007, the International Biofuels Forum was created as a joint initiative of Brazil, USA, EU, India, China, and South Africa, with the specific aim of promoting a greater coordination, viewing the

establishment of common standards and the “commodification” of biofuels (bioethanol and biodiesel).

In December 2007, the “White Paper on Internationally Compatible Biofuel Standards” was published as a result of the work of a “Tripartite Task Force,” composed of representatives from Brazil, USA, and EU. The White Paper offered the basis for further development of measurement standards and for documentary standards, the two facets of the standardization process.

With respect to measurement standards, based on the conclusions of the White Paper, the National Institute of Metrology, Quality and Technology (Inmetro), the Brazilian NMI, and the National Institute of Standards and Technology (NIST), the North-American NMI, advanced the development of certified reference materials (CRM) for bioethanol and biodiesel, an important step toward the standardization process.

The development of CRMs for the fuel is fundamental, since these devices represent stable, homogeneous and highly reliable substances, accompanied by a certificate that states both the property and uncertainty measurement values, and can be applied in activities such as equipment calibration, quality control and method validation.

These CRMs then became the basis of comparison for the laboratories involved in the European BIOREMA Project, through which, besides Inmetro and NIST, other NMIs of interested countries, as NPL (England) and NMI (Netherlands), gathered together for the development of inter-laboratory analysis for bioethanol as much as for biodiesel. After having concluded this inter-comparison, it is foreseen that the joint Inmetro/NIST CRMs reach a level of international recognition and may be supplied in commercial scale to other markets.

Regarding the elaboration of documentary standards, the other facet of the standardization process, it is important to reckon that the Technical Management Board of the International Standardization Organization (ISO), approved, at the end of 2007, the creation of the subcommittee 7 within the scope of the Technical Committee for Fuels (TC-28), especially dedicated to liquid biofuels. Moreover, in 2009 the “Project committee: Sustainability criteria for bioenergy” (TC 248) was created. It is foreseen that the results of the study carried by these two committees within ISO will represent a sound advance in the elaboration of documentary standards for biofuels.

This important role played by measurement standards and documentary standards will, then, avoid the need of repeating test analysis—therefore, decreasing costs—and mainly conceding credibility to the trade of biofuels, contributing to raise them to the status of international commodities.

Author Biographies

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