WORLD TRADE ORGANIZATION

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Committee on Technical Barriers to Trade

SUMMARY REPORT OF THE TBT WORKSHOP ON THE ROLE OF INTERNATIONAL STANDARDS IN ECONOMIC DEVELOPMENT 16-17 MARCH 2009

Note by the Secretariat[1]

The use of international standards and conformity assessment systems facilitates the conduct of international trade. The TBT Committee has explored ways and means of enhancing Members' awareness of, and participation in, the work of international standardizing bodies, thereby improving the implementation of the TBT Agreement. To build on this work the Committee held a Workshop on the Role of International Standards in Economic Development.

The Workshop was divided into four sessions. The first session focused on the economics of standardization, the second on case studies on the use of international standards, the third on efforts to build capacity for standardization in developing countries, and the fourth on the identification of key challenges.[2]

This Report provides a summary of key points and issues that arose from the presentations and discussions during the Workshop. The full presentations made by speakers are available on the WTO TBT website.[3] Two background notes by the Secretariat, circulated at the Workshop, are contained in documents JOB(09)/15 and JOB(09)/17.

[1] This document has been prepared under the Secretariat's own responsibility and is without prejudice to the positions of Members and to their rights and obligations under the WTO.

[2] The programme, as well as the biographies of speakers and moderators, is contained in Annex 1.

[3] WTO TBT Website http://www.wto.org/english/news_e/news09_e/tbt_16mar09_e.htm.

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OPENING REMARKS

1. Mr. Harsha V. Singh, Deputy-Director General of the WTO, opened the Workshop. In his opening remarks, Mr. Singh provided an overview of issues related to standards, trade and the WTO. He stressed the economic benefits of standardization and highlighted some of the costs; he underscored the importance of the disciplines in the TBT Agreement as they apply to standardizing bodies and to Member governments, and he also drew attention to the increasing importance of addressing non-tariff barriers to trade in the WTO, including in the negotiating context.

I. THE ECONOMICS OF STANDARDIZATION

2. The moderator, Mr. John Tucker[4] (Australia), noted that the purpose of Session I was to provide an overview and perspective of current work on the topic of standards, trade and economic growth, including issues such as: quantifying the welfare effects of standardization; the contribution of standards to innovation and technical progress; and, the importance of standards in development work. It was important, he said, that standards – just like regulation – complied with the same principles that constitute good regulatory practice.[5] It was important, he said, to focus on features in standards development that contribute to successes, that promote trade rather than create barriers. Mr. Tucker noted that Australia requires a "net benefit case" for each and every standard that is developed. He noted that his organization was contributing to work underway in the ISO looking at a harmonized assessment methodology for assessing the economic effects of standards.[6]

A. STUDIES ON THE ECONOMIC IMPACT OF STANDARDS IN EUROPE

3. Prof. Knut Blind (European Communities) noted that it is not easy to categorize economic studies that are about the impact of standards on economic development. Although standards can be considered as an instrument for regulation and, consequently, analyzed under the classical Regulatory Impact Analysis[7], this was generally not done. He said that standards have to be seen as an output of a complex innovation process. They are, in fact, a pool of knowledge available to the economy as a whole, as well as to specific companies. Technical standards, in particular, are strongly based on state-of-the-art science and technology. Prof. Blind said that it is possible to distinguish between micro and macro economic studies on the impact of standards. For instance, he noted that there are a number of studies relating to the ISO 9000 and ISO 14000 series, especially in the United States; these studies tied productivity effects to the implementation of those standards. On the macro level, however, there are fewer studies. A number of these, discussed below, focus on Europe and relate to the stock of existing standards with economic growth.

4. Prof. Blind said that a general assumption with respect to the macro studies is that technical standards qualify technological know-how like other public instruments, especially patents. In his work with other authors (Jungmittag), Prof. Blind held that standards, like patents, contribute to economic growth. The European studies on the economic impact of standards started with the study of the German Institute for Standardization (DIN) on the Economic Benefits of Standardization.[8] This study found that standards made a very significant contribution to economic growth, similar to that of

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[4] Document G/TBT/GEN/80/Rev.1 contains brief biographies on the speakers and moderators.

[5] Document G/TBT/W/287 contains a summary report of a WTO TBT Committee Workshop on Good Regulatory Practice, held on 18-19 March 2009.

[6] The ISO/IEC Information Centre website contains an "Inventory of Studies on the Economic and Social Benefits of Standardization". Website: http://www.standardsinfo.net/info/livelink/fetch/2000/148478/6301438/benefits/benefits.html

[7] OECD (1997): Regulatory Impact Analysis: Best Practices in OECD Countries, Paris: OECD Publications Service. Website: http://www.oecd.org/dataoecd/21/59/35258828.pdf

[8] German Institute for Standardization e. V. (DIN), "Economic Benefits of Standardization – Summary of results", Beuth Verlag, Berlin, Germany, 2000.

patents. Based on this study, others were made elsewhere – for instance, the Department of Trade of Industry (DTI) of the United Kingdom in 2005 replicated the German approach and found significant but somewhat lower impacts of standards on total factor productivity and economic growth.[9] Another, more recent study done in Denmark (in 2007) also found a lower contribution of standards to growth.[10] In 2009, a French study, also replicating the German approach, found almost identical results, i.e., around one per cent of the annual GDP is related to the existing stock of standards.[11]

5. Work done in 2008[12] which compared four countries (United Kingdom, France, Italy and Germany) confirmed that both the stock of technical standards and patents contributed significantly to economic growth in the 1990s. A notable empirical finding of this study was that standards contribute to growth in those sectors which are less R&D intensive and that, for more R&D intensive industries, patents are more important.

6. In terms of the role of standards in trade flows, Prof. Blind drew participants' attention to the pioneering work of Peter Swann. In his work, Swann had found, in general, that in the United Kingdom, standards are trade enhancing – not only international standards but also national standards contributed positively, especially for intra-industry trade. Hence, standards promote exports.[13] In further work, Prof. Blind noted that it had been found that international standards are especially positive for international trade, whereas the contribution of national standards is ambivalent.[14]

7. Prof. Blind concluded with five challenges. First, he said that all the studies referred to (above) did not reflect the fact that standards, like patents, are a result of R&D and innovation efforts. Second, the trade enhancing effect of standards had to be acknowledged, especially the market integration effect of European standards for the completion of the single market in Europe. Third, all of the studies mentioned relied on the stock of standards published by formal standardization bodies (like ISO, IEC and ITU). However, increasingly, and particularly in the information and communication technologies (ICT) sector, consortia standards were being published; in other words, *de facto* standards played a more relevant role than formal standards, e.g. certain published standards that are the basis for the internet.[15] Fourth, the studies are based on publications of the active number of standards, whereas their diffusion and implementation is not taken into consideration. Finally, there is a need to come up with a more advanced methodology to assess the impact of standards, as well as more comprehensive databases, in order to make progress in assessing the economic impact of standards. Prof. Blind said that this is crucial because standards are an important instrument not only for trade policy but also an instrument for innovation and competition policy.

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[9] UK Department of Trade and Industry (2005), "The Empirical Economics of Standards", DTI Economics Paper No. 12, DTI, UK.

[10] CEBR - Centre for Economic and Business Research (2007): Standards and economic growth in Denmark, Frederiksberg.

[11] AFNOR (2009): The economic impact of standardization - Technological change, standards and long-term growth in France, Paris.

[12] Blind, K.; Jungmittag, A. (2008): The Impact of Patents and Standards on Macroeconomic Growth: A Panel Approach Covering Four Countries and 12 Sectors. In: Journal of Productivity Analysis, 29, pp. 51-60.

[13] Swann, G.M.P.; Temple, P.; Shurmer, M. (1996): Standards and Trade Performance: The UK Experience. In: Economic Journal, 106, pp. 1297-1313.

[14] Blind, K.; Jungmittag, A. (2005a): The Impacts of Innovations and Standards on German-French Trade Flows. In: Économie Appliquée, 58 (2), pp. 99-125; and Blind, K.; Jungmittag, A. (2005b): Trade and the Impact of Innovations and Standards: The Case of Germany and the UK. In: Applied Economics, 37 (12), pp. 1385-1398.

[15] Blind, K.; Gauch, S. (2008): Trends in ICT Standards in European Standardization Bodies and Standards Consortia. In: Telecommunication Policy, 32 (7), pp. 503-513.

8. Mr. Heinz Gaub (European Communities) complemented Prof. Blind's presentation with a number of practical examples on benefits of standards use.[16] Among the examples presented by Mr. Gaub, he noted that standards facilitate communication. Whenever a new technological field became a subject of standardization work, typically it would start with terminology standards. Indeed, international and inter-cultural communication among scientists and engineers would be difficult without a common language for quantities and units. The International System of Units (IS) as laid down in ISO 1000, DIN 1301 and the ISO 31 series of standards (soon to be the ISO 80000 series) provided a basis for worldwide understanding. As another example, Mr. Gaub explained how standards also made possible the comparisons of quality. For instance, by specifying the means of obtaining and presenting comparable data describing the basic properties of plastics, the two standards series DIN EN ISO 10350 and DIN EN ISO 11403 provided the basis for an international database of plastics properties and characteristics which today cover 90 per cent of the world plastics market. These standards had been useful for producers because they reduced the number of samples for tests and provided a good basis for the automation of plastics manufacturing.

9. In addition to the points made by Prof. Blind, Mr. Gaub noted that by *participating* in standardization, particularly at the international level, companies gained a competitive advantage. They learned about new technologies and were able to build networks and familiarize themselves with other parties interested in a specific standardization project. Such participation also lowered transaction costs and, in the R&D context, reduced research risk and development costs of new technologies and new products. Mr. Gaub also drew participants' attention to an assessment tool that had been programmed at DIN to help the user assess potential economic benefits for the application of a particular standard, or group of standards. Essentially, this was a computer-based interactive checklist that helped the user establish a monetary value on the specific business benefits for the use of a certain standard.[17]

10. In response to questions, Prof. Blind noted that, particularly at the European level, standardization activities were progressively being recognized as an important instrument for innovation policy and knowledge transfer. Increasingly, standardization was seen as an important conduit between research and market. This, he said, was also valid for developing countries.[18] For developing countries two issues were important to consider. First, standards were a means to gain knowledge. Second, there was a need to build up infrastructure which would be compatible with the infrastructures in major export markets; this infrastructure was crucial as it provided compatibility and acceptance to exported products. Prof. Blind also pointed out the importance of developing countries establishing priorities, to focus on specific sectors that enjoyed a comparative advantage. In respect of participation, Prof. Blind noted that efforts were underway to find ways to improve incentives for SMEs to participate in standardization; in particular, it was important to clarify to SMEs the benefits of standards and to make more concrete the positive impact of such participation.

11. In response to a question about ways to maximize the economic benefits of standards, Prof. Blind stressed the importance of an open and transparent process that allowed all stakeholders to be involved. As well, standards needed to take into account state-of-the-art science and technology. This meant that standards have to continuously adapt to new developments in the field of science and technology. Outdated standards were not good for economic growth. On the contrary, they hindered innovation.

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[16] More detail on these examples can be found in Mr. Gaub's PowerPoint slides on the WTO website.

[17] http://www.anp.din.de/cmd?level=tpl-artikel&cmstextid=90249&languageid=en. Currently in German only. An English version is forthcoming.

[18] More information is contained in a paper on the role of standards and IP for developing countries on the UNIDO website: http://www.unido.org/fileadmin/import/44913_BackgroundPaper_Blind.pdf .

B. STANDARDS AND TECHNOLOGY DIFFUSION IN CHINA

12. Mr. Rengang Huang (China) noted that studies in China demonstrated a positive relationship between standardization and economic growth. A recent empirical analysis undertaken by China's National Institute for Standardization (CNIS) had shown that from 1978 to 2007 the flexibility coefficient of China's stock of standards contributing to the GDP growth was 0.079 (meaning that a one per cent increase in the national standards stock was related to a 0.079 per cent increase in GDP). Hence, a key conclusion was that the stock of standards in China over the past 30 years had contributed positively to China's economic growth.[19]

13. Mr. Huang cautioned, however, against the notion that the impact of standards on trade was only positive. He said that the existence of certain technical standards imposed by trading partners had generated barriers to trade that, each year, cost China up to USD 8 billion. Hence, he said, it is also important to consider the cost of standards. Moreover, not all standards are "open" so it is not always possible to assume that standards always contribute to technology transfer, innovation and progress – and, therefore, economic growth. Sometimes, the fact that some technology is patented could hinder progress in standardization. Of course, he said, the appropriate use of standards in regulation is an important policy tool for Members. In sum, given the complexity of the subject, it is too simplistic to say that standards are either "good" or "bad". Many factors need to be taken into account, including the notion of what constitutes a legitimate policy objective to be pursued. In this respect, Mr. Huang emphasized that there is no agreed definition of the term "legitimate objective" in the TBT Agreement.

14. In respect of participation by developing countries in international standard-setting activities, Mr. Huang stressed the need for developing countries to become more active and involved – with respect to both the development of standards and their implementation. He urged developed countries with more experience to make a firm commitment to help developing countries raise and improve capacity in this regard.

15. In the discussion, the representative of Kenya noted that even when developing countries made the effort to participate in international standards-setting activities, increasingly "private standards" were becoming the real constraint. This constituted an additional burden as it was not possible to participate in private standardization activities. Mr. Huang said that, in his view, most international standards were, in some sense, "private": they were often developed by private individual organizations without necessarily global consensus or approval procedures. In terms of addressing private standard-setting, there was no "quick fix". A concerted effort at the international level by developing countries to address these issues was important.

16. Prof. Blind pointed out that private standards are often developed by two or three very strong players on the market, based on intellectual property rights (patents), and that the solutions developed in this context were not necessarily good for competition, and were at times developed in parallel with the formal standard-setting processes. Nevertheless, Prof. Blind noted that this remained an important instrument for single companies to gain competitive advantage and should not be restricted unless they hindered competition. Hence, there had to be a careful balance between the open and transparent processes which benefited everybody, while leaving open the incentives for single companies or small groups of companies to come up with their own solutions (unless these hindered competition). He noted that at the moment there were discussions at the European level about how to align this separate standardization with the formal standardization so as to avoid friction. This was particularly an issue in the ICT sector.

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[19] The analysis was conducted by Dr. Ding Wenxing, China National Institute for Standardization (CNIS). It is contained in the publication "Standardization and Economic Development: Theory, Empirical Studies and Cases", by Professor YU Xinli, Standards Press of China, 2008.

C. THE ECONOMIC VALUE OF STANDARDIZATION IN CANADA

17. Mr. Stephen Head (Canada) presented an overview of a study undertaken in Canada in 2006 on the impact of standardization on the Canadian economy.[20] The empirical quantitative section, which used a model similar to that used in the UK and Germany, made comparable findings to those arrived at in these two countries: there was a positive and significant impact on labour productivity and economic growth as a result of the existence of standards. In essence, this work suggested that over the period 1981 to 2004, the growth in the number of standards (in Canada) had accounted for 17 per cent of labour productivity growth and about nine per cent of growth in economic output (real GDP). This implied that, in any given year, growth in the quantity of standards had been an important contributor to growth in labour productivity and output.

18. In the qualitative part of the study, key stakeholders had provided compelling examples of the benefits of standardization. For instance, stakeholders had cited that standards: facilitate trade, encourage innovation and R&D; establish credibility and quality; and reduce health and safety risks. Also, participation in standard-setting was beneficial in and of itself, for instance, because such participation: enhances professional interaction, enables firms to influence standards, and creates a demand for superior products (through a professional exchange of ideas).

19. Two case studies were undertaken to allow for a more in-depth look at benefits at an individual firm level. The first was on the implementation of ISO 14001 in SaskPower (an energy company in the Canadian Province of Saskatchewan). This case study showed benefits with respect to: increased confidence that environmental risks were being managed with better trained and environmentally sensitive staff; increased credibility with regulators and customers; improved understanding and compliance with legal requirements; and greater focus and attention to priority areas through objective setting and progress monitoring. The second case study was done on the implementation of ISO 9001 in Infasco, a Canadian manufacturer of steel products. Similar benefits were found, as well as: higher quality products through the use of performance metrics; and improved handling of customer complaints.

D. JAPAN: THE VALUE OF STANDARDIZATION AT THE BUSINESS LEVEL

20. Prof. Manabu Eto (Japan) noted that, in June 2003, a "Study group on the economic impact of standardization" had been established to quantify the "meaning" and "value" resulting from the commitment of business management and policy to international standardization activities. This Group had, over five years, worked on a number of case studies conducted at the corporate level focusing on the effect standardization had on business development. A report was compiled on the outcome of the projects. Among the conclusions made, Prof. Eto drew participants' attention to the following. First, it appeared that mainstream standardization had moved from *de facto* standards to the development of consensus based standards (such as an international standards). Second, the influence of standards on economic welfare could be classified as "market expansion" and "cost reduction" for such consensus-based product standards. Third, standardization made it possible for both countries which had technology and those which had productive capacity to benefit from their respective strengths.

[20] Haimowitz, Joseph and Warren, Joanne, Economic Value of Standardization, The Conference Board of Canada, Standards Council of Canada (SCC), 2007.

E. QUANTITATIVE ASSESSMENT – THE EXPERIENCE OF CHINESE TAIPEI

21. Mr. Eho-Cheng Lo (Chinese Taipei) stressed that quantitative assessment is important because it objectively demonstrates the tangible value of standardization. He pointed out the usefulness of focusing on the effects and changes (standards outcome) resulting from the use of these standards, rather than the number of standards produced (standards output). Although much work had been done at national levels, assessing the economic benefits of standards, the use of a *harmonized* quantitative assessment method in standardization economics had only been explored to a limited extent. He argued that a globally accepted, harmonized quantitative assessment methodology at both a micro- and a macro-level, if workable, could make the economics of standardization more persuasive and easier to present. It would make comparisons possible both geographically and over time. Such a harmonized assessment methodology could pave the way for formulating economically efficient standardization policies. In light of this, Mr. Lo strongly encouraged the collaboration between relevant bodies, such as standards development organizations, academia and regulatory bodies, in order to develop and agree on a harmonized methodology, which could be quantitative models, equations, directives, guidelines and/or principles, for assessing and quantifying the benefits of standardization.

F. ANALYTIC TOOLS FOR THE ECONOMIC IMPACT ASSESSMENT OF STANDARDIZATION – A MODEL DEVELOPED IN KOREA

22. Dr. Hyang Sun (Korea) noted, as with the previous speaker, that there is no generally accepted, single methodology for the impact assessment of standards programs. This, he said, is because the economic outcomes that analysts seek to quantify vary significantly with the diversity and complexity of affected industries. Nevertheless the Korean Agency for Technology and Standards (KATS), had developed a methodology and an associated web programme which is designed to analyze the economic effect of standards programs.[21]

II. CASE STUDIES ON THE USE OF INTERNATIONAL STANDARDS

23. The moderator, Mr. Michel Jeanson (European Commission) introduced the session which focused on cases/experiences illustrating how the use of standards has contributed to economic development. He said that both national and international standards are developed in an open process based upon the consensus of all interested parties. Significantly, their development is a form of cooperation at the international level. Case studies during this session were intended to reflect topics of interest to developing countries - the importance of the implementation and application of voluntary, national and international standards. Mr. Jeanson emphasized issues for reflection during the session: possible commonalities; whether standards provide solutions; and, where they have proved successful, why?

A. COFFEE AND ASPARAGUS: THE IMPACT OF STANDARDIZATION IN PERU

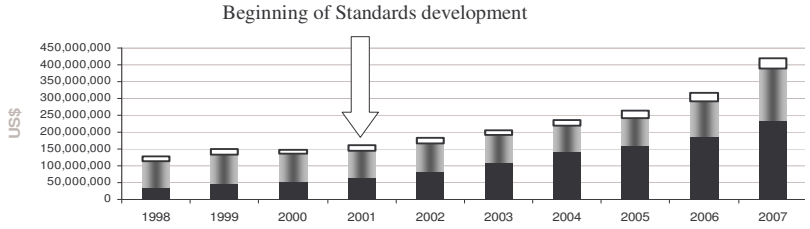
24. Mr. Augusto Mello (Peru) presented the Peruvian experience of standards and their impact in the agri-business sector, specifically asparagus and coffee. Once standardization was applied the impact on quality and innovation resulted in a substantial increase in exports over a ten year period and an ongoing increase in production. Uncertainty over product quality and safety was reduced. Producers and exporters, with the support of the Government and the Peruvian Standardization and Accreditation Body (INDECOPI[22]), forged a strategic alliance which provided greater investment and complementary use of technology and innovation. The importance of technical assistance and

[21] The details of this programme are set out in Dr. Sun's PowerPoint presentation, available at: http://www.wto.org/english/news_e/news09_e/tbt_16mar09_e.htm (Session 1).

[22] INDECOPI website http://www.indecopi.gob.pe/

capacity building is demonstrated in the cooperation between INDECOPI and PromPeru (the Peruvian Export Promotion Agency) who, on the basis of international technical cooperation, have contributed to the development of standards and conformity in Peru. This development, through technical committees and based on international standards, has affected the entire production chain - training, risk analysis, critical control points – resulting in quality produce for the international market and a substantial increase in exports. This model is now being used for other products in Peru.

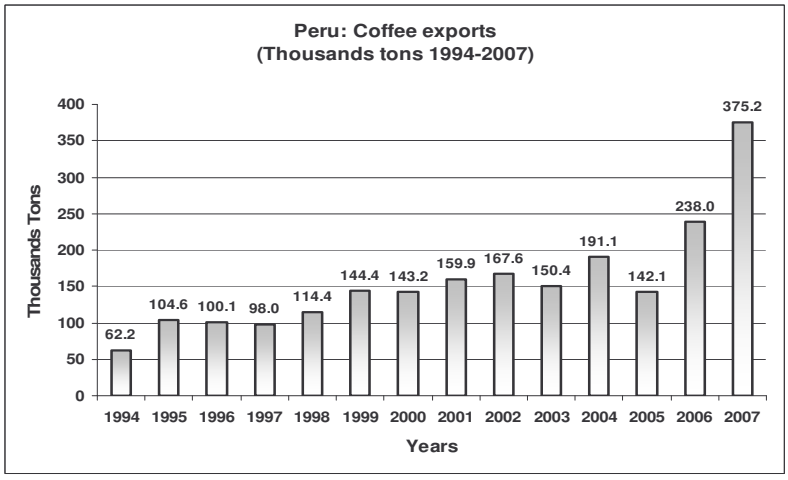
Figure 1: Asparagus Exports (USD Mills FOB 1998-2007)



VALUE (US$Mills)	1998	2006	2007	Part % 98	Part % 07	Var % (98-07)	Var % (06-07)
FRESH ●	35.70	187.00	235.10	28%	56%	559%	26%
CANNED ◍	77.80	104.30	154.30	61%	37%	98%	48%
FROZEN ○	14.10	26.60	30.20	11%	7%	114%	14%
TOTAL	127.60	317.90	419.60	100%	100%	TOTAL	32%

Source: SUNAT / ADEX
Prepared by: Inform@ccion

Figure 2: Peru Coffee Exports (Thousands of tons 1994 - 2007)



Source: PROMPERU

B. TEXTILES: THE USE OF STANDARDS IN THE TEXTILES SECTOR AND CHALLENGES TO SMES IN PAKISTAN

25. Mrs. Aisha Humera Moriani and Mr. Muhammad Muzzammil Hussain presented Pakistan's use of standards in the textiles sector and challenges to SMEs. Pakistan is a major cotton producer whose textile industry generates 60 per cent of exports, constitutes 40 per cent of the manufacturing industry and impacts on other sectors such as transport, shipping, insurance and banking. Forty per cent of Pakistan's workforce is engaged in activities related to the textile sector – agricultural producers, spinners, weavers, specialists in all aspects of processing. The need for industry-specific standards for SMEs, the backbone of the economy, has proved imperative - necessitating Pakistan's regulatory framework being merged under Pakistan's Standard Quality Control Authority (PSQCA). Given Pakistan's experience in dealing with a proliferation of 'private standards', it was recommended that variations in private standards needed first to reduced, and then harmonized to international standards.

26. The establishment of the Small Medium Enterprise Development Authority, to promote a facilitating environment, enabled SMEs to interact with stakeholders; identifying issues and assisting in the development of relevant policies (e.g. training) and standards. International standards compliance has provided encouragement to SMEs, supporting them with the motivation to gain premium prices. The encouragement and incentives offered by the Government, including national reward systems, assisted in promoting compliance with international standards.

C. BIOFUELS: THE USE OF STANDARDS IN THE BIOFUELS SECTOR

27. Mr. Jorge Cruz (Brazil) presented on the cooperation between the Brazilian National Institute of Metrology, Standardization and Industrial Quality (INMETRO) and the United States National Institute of Standards and Technology (NIST) on measurement standards. To support the global trade of biofuels, INMETRO and NIST are working cooperatively to promote biofuels-related standards through the development of certified reference materials. INMETRO is taking the lead producing CRMs for ethanol, whilst NIST is producing CRM for biodiesel. This work would not only facilitate the increased use of biofuels in each of their markets, but would also support both exporters and importers of biofuels by helping to avoid adverse trade impacts in a global market. Brazil and the United States, through the Tripartite Task Force (Brazil, European Union and United States), have initially identified: (i) areas of existing measurement and (ii) the need for additional refinements of testing methods. They will review consistency of test methods to ensure comparability and validation of results; they also intend to make recommendations to harmonize terminology.

28. The scope of collaboration between NIST and INMETRO will be to advance work on the technical issues identified above with the aim to support biofuels trade, to improve efficiency of biofuels production and to promote innovative energy resources. Cooperation is also promoted through the International Biofuels Forum (IBF) and the BIOREMA Project for biofuels reference materials. This Project was established by the European Commission under its 7th Framework Programme for research.

D. LAMPS AND REFRIGERATORS: THE USE OF STANDARDS FOR ENERGY EFFICIENCY IN CHILE

29. Mr. Jorge Muñoz Canave (Chile) presented on the use of standards for energy efficiency. In 2004 Chile faced energy difficulties due to the lack of rain for hydroelectric power and limitations in the supply of natural gas. In 2005 an Energy Efficiency Program was established, based on three pillars: to ensure energy safety and supply; to diversify energy input; and, to provide energy savings and efficiency. This program, funded by the government agency that promotes innovation and production (CORFO), gave rise to an energy efficiency labelling scheme. The government identified

that the largest consumption of domestic electricity was refrigeration at 32 per cent and lumination at 27 per cent. Together with SEC, the Chilean energy agency, a project on energy efficiency to improve the quality, safety and efficiency of domestic appliances was established in conjunction with CORFO.

30. The selection of standards to be adopted/harmonized was to be agreed by SEC and the National Institute for Standards (INN[23]), using international standards as a baseline. The Energy Efficiency Program was implemented from 2005 to 2008 and was subject to the preliminary understanding that appliances would be labelled on the basis of Chilean standards, with the agreement of all interested parties (manufacturers, importers, consumer groups, laboratories) and that requirements and testing methods would be based on international standards. As a result, 52 Chilean standards for energy efficiency were adopted. Standards labelling, where the efficiency rating Class A (highest) to G (lowest) is used, has resulted in the majority of lamps now complying with Class A and B; and 50 per cent of refrigeration units complying with Class A. The success of energy efficiency labelling for refrigerators and lamps is now spreading to other products, for example: microwave ovens and motors.

E. BUILDING CODES AND CONSTRUCTION: THE USE OF INTERNATIONAL STANDARDS IN THE AREA OF PUBLIC SAFETY

31. Mr. Manuel Lascarro (Colombia) presented on the use of standards in the public safety area: building codes and construction materials. In the 1990s, it was estimated that a USD 40 billion investment in risk reduction strategies for natural disasters worldwide could have saved not only lives, but USD 280 billion in economic losses. One effective risk reduction strategy is the correct understanding of up-to-date codes and standards. In Colombia's experience, helping to address understanding, through partnership in standards development, leads to improvement in public safety. Colombia has suffered major natural disasters resulting in injury, death and economic loss. Experts concluded that problematic construction was contributory due to the lack of quality control and extended self-construction practices. The construction industry is a complex activity which has to take into account many variables to ensure public safety: materials; testing laboratories; structural design; production equipment; construction techniques; and, contractor qualifications. Any miscalculation with any of the variables could result in human and/or economic risk.

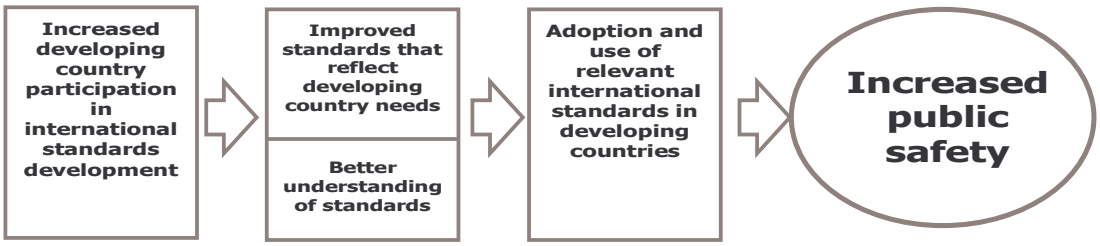
32. Many developing countries lack the resources to develop their own codes or standards. In 2001, ASTM International[24] initiated their Memoranda of Understanding (MoU) Program to promote communication between ASTM and national standards bodies in developing countries worldwide. The programme aids the development of national standards to assist the country's health, safety, environmental and economical conditions. Standards developed at ASTM are the work of over 30,000 members – technical experts representing producers, users, consumers, government and academia from over 120 countries. Participation in ASTM International is open to all and the first to sign a MoU was Colombia. More than 90 Colombian representatives now participate directly in ASTM technical committees and their work has continued to influence the content of ASTM standards. As an example, in 2006, thanks to modern tools like web-conferences, a testing standard for self consolidating concrete, a relative new material, was delivered by ASTM incorporating the point of view of Colombian engineers. The joining of forces between ASTM, its members, and the Colombian national standards body (ICONTEC) has enhanced awareness of standards application in construction and assisted in the identification of diverse needs and gaps in different parts of the construction quality chain. Today, approximately 850 Colombian standards made by ICONTEC are based on, or have a relation with, ASTM standards. This is an example of how developing countries

[23] INN website: http://www.inn.cl

[24] Originally known as the American Society for Testing and Materials (ASTM), a large developer of voluntary standards, covering materials, products, systems and services. (Website: http://astm.org/)

with construction needs can obtain support to develop and adopt international standards which reflect their specific needs and provide increased awareness of the quality chain and public safety.

Figure 3: Impact of Construction Standards on Public Safety



F. THE IMPACT OF HARMONIZATION OF NATIONAL STANDARDS WITH INTERNATIONAL STANDARDS IN EGYPT

33. Eng. Samia El-Azazy (Egypt) presented on the impact of the harmonization of Egyptian standards with international standards. The presentation included an introduction on the Egyptian Organization for Standardization and Quality (EOS) and its role in promoting Egyptian trade and industry. The objectives of EOS are to: harmonize standards, technical regulations and conformity assessment procedures in the national and international arena; support the growth and development of Egypt's industry and trade; promote exports; transfer of technology and know-how; increase Egyptian product competitiveness; environmental protection and consumer awareness. EOS' main activities are elaboration of Egyptian Standards; certification of products (schemes of Quality Mark and Conformity Mark); testing and inspections; calibration of measuring and testing equipment; technical consultancy and training services in the areas of Standards and Quality; information services related to standards; and, maintaining the EOS/TBT Enquiry Point. EOS views the setting of standards as crucial, with the positive effect of increasing price competition, improving quality, as well as ensuring compatibility and interoperability between products.

34. Harmonization of standards for Egypt is an element of the Egyptian National Quality Plan, adopted in 2004 with a view to strengthening and upgrading the national quality infrastructure to attain international recognition. Harmonization has meant reviewing national standards against international standards in order to assess technical equivalence, and modernization of standards in order to ensure that differences would not constitute technical barriers to trade. In Egypt, out of more than 8,500 standards adopted so far, less than seven per cent are mandatory, the majority are voluntary. The impact on Egypt's economy, following international standards adoption, has resulted in manufacturers producing more products in accordance with international standards; having greater access to international markets; and foreign investments have increased as international companies are no longer obliged to produce according to local standards. Harmonization has resulted in a faster,

consistent standardization process; a wider range of manufacturing and service areas; enhanced commitment and participation by stakeholders; increased awareness of consumers and standard users; fewer consumer complaints and the introduction of acceptable solutions for trade and industry problems; confidence in standardization and conformity assessment procedures; and the facilitation of trade with the resulting increase in both imports and exports. Harmonization of national standards with international standards, although not an easy process, is the easiest way to access international markets.

G. STANDARDS IN THE AREA OF ELECTROTECHNOLOGY: THE KENYAN EXPERIENCE

35. Mrs. Evah Oduor (Kenya) presented on electrotechnology standards in Kenya. Kenya's electronics industry is small and the majority of electrical and electronic products are imported, necessitating the use of electrotechnology standards for conformity assessment purposes. Previous imports of below-standard products necessitated the need to improve quality and protect customers. Kenya joined the International Electrotechnical Commission (IEC) Affiliates Programme[25] in 2004 and through this programme was able to adopt 50 free standards.[26] Despite the absence of voting rights, Kenya exercised their entitlement to comment on standards under development. Membership to the IEC followed in 2005. In order to fulfil membership qualification a national electrotechnical committee was set up, the Kenya National Committee of the IEC (KNCIEC). The Committee membership stakeholders include manufacturers, regulators, utility companies, communication companies and consumer organizations.

36. The effective use of electrotechnical standards has also facilitated an expansion of exports. Kenyan companies who apply IEC standards have succeeded in gaining market share in east, central and southern Africa. Previously some of those companies had little or no domestic presence. The quality of product has enabled them to penetrate those markets. In 2005 Kenya launched a Preshipment Verification of Conformity to Standards (PVOC) programme for products considered to have an impact on health, safety and the environment. Under this programme products must be verified in the country of origin prior to shipment, easing imports. Using PVOC, and the IEC Certification Scheme, product rejection has fallen from 52 to 21 per cent over a four year period. Benchmarking new and international standards has provided fair trade for everybody - improvement in technology, product and consumer confidence. Using electrotechnical standards, and finding that they are able to manage the conformity assessment program, has improved market access for exports from small industries in Kenya.

III. BUILDING CAPACITY

37. The moderator, Ms Ileana Martinez (United States) introduced the session on building capacity, the purpose of which was to discuss ongoing efforts to address developing country capacity constraints with respect to international standards. The efficacy of existing efforts to promote and enhance participation in developing countries in international standard-setting activities was addressed. Discussion touched upon work done at regional and international level to build capacity with specific regard to conformity assessment infrastructure; the relevancy of work on Aid for Trade in the WTO and the activities of SPS Standards and Trade Development Facility (STDF).

A. TWINNING ARRANGEMENTS IN TECHNICAL STANDARDS DEVELOPMENT: THE COLOMBIAN VIEW

38. Mr. Fabio Tobón (Colombia) presented on twinning arrangements in international standards development. Developing internationally accepted standards has predominantly been undertaken by

[25] IEC Affiliates Programme website: http://www.iec.ch/affiliates/
[26] 200 free standards are now available under the Affiliates Program.

developed or industrialized countries through international standardization bodies worldwide. Developing countries, through National Standards Bodies (NSB), seldom participate actively in the development of international standards due to the lack of resources, both economic and technical. Although about 75 per cent of ISO members are from developing countries, these countries only make up three per cent of the working groups and technical committees in ISO. The need to create capacity for active participation was identified and, in 2002, the Technical Management Board of ISO introduced the concept of 'twinning': cooperation between a developed and a developing countries.

39. Twinning was designed to enable a developed country and a developing country to cooperate and work together, for instance to lead a working group or a technical committee – the developing country would benefit from the experience of the developed country. In addition, the developed country could represent the developing country in various committees if the developing country could not attend, even holding voting rights on their behalf. However, despite good intentions, 'twinning' proved problematic and in 2007 the concept was expanded to that of 'partnering', which likewise encountered obstacles. Mr. Tobón was of the view that the value and reach of different twinning arrangements and their usefulness to the development of international standards needed analysis. Other means could be considered as well, including the use of electronic tools and videoconferencing. Colombia, a member of the Pan American Standards Organization (COPANT), worked with fellow members in central and southern America to identify the best way to run technical committees, how to work on standard-setting, and how to assist other countries in their participation in standards organizations.

40. Mr. Tobón said that the number of international standards organizations, the duplication of standards, and the proliferation of voluntary technical standards, are serious problems for developing countries. Although developing countries may lack the technical know-how and economic resources, they recognize the need to expand their own capacity and participate in international standards-setting. Developing countries realize the importance of implementing standards and therefore it is imperative that governments play an active role within the standards development framework.

41. In the discussion, it was pointed out that a major challenge with standardization was the *implementation* of the standard – not only its development and adoption. Appropriate implementation made all the difference in terms of realization of the benefits. It was important for Members to look into strategies and mechanisms in this regard.

B. TECHNICAL INFRASTRUCTURE DEVELOPMENT IN THE ASIA PACIFIC ECONOMIC COOPERATION (APEC)

42. Mr. Gary Kushnier (United States) presented on technical infrastructure development in APEC. APEC's Committee on Trade and Investment works to reduce impediments to business activities through sub-fora which includes the Sub-Committee on Standards and Conformance (SCSC). Within APEC there are five Specialist Regional Bodies[27] (SRBs) with expertise in the areas of standardization, accreditation and metrology. The SRB final objective is a standards and conformance infrastructure that simultaneously addresses APEC goals, including sustained economic growth through a commitment to open trade, investment and economic reform in the Asia Pacific region, and also meets the needs of APEC member economies. A "Specialist Regional Bodies Strategic Plan for Technical Infrastructure Development in Support of Trade Facilitation for and in APEC Economies"[28] summarizes activities undertaken by the SRBs in recent years and outlines some projects and activities planned for the next five years. The SRBs emphasize that the objectives of the

[27] Asia-Pacific Laboratory Accreditation Cooperation (APLAC); Pacific Accreditation Cooperation (PAC); Asia-Pacific Metrology Forum (APLMF); Asia-Pacific Metrology Programme (APMP); and the Pacific Area Standards Congress (PASC).

[28] Website: http://aimp.apec.org/Documents/2009/SCSC/SCSC1/09_scsc1_035.pdf

plan will be more effectively realized through the active support of the APEC SCSC. In particular, the APEC SCSC encourages regulators in the APEC economies to see the value of a strong standards and conformance infrastructure in their economies and for national infrastructure to be linked within the region via the SRBs. Further, the APEC SCSC should encourage regulators to use the infrastructure as a means to achieve good regulatory practice and minimize barriers to trade. Industry should also be encouraged to use the standards and conformance infrastructure. Engagement by the APEC SCSC with the APEC Business Advisory Council (ABAC) has been encouraged and the SRBs have begun a dialogue with the ABAC to better understand industry needs in the region.

43. Mr. Kushnier highlighted two critical points with regard the importance of adopted national standards being aligned with international standards to provide transparent, national requirements. The first, that SRBs rely and leverage the critical WTO TBT criteria for the development of international standards, emphasizing the process rather than the particular sources of international standards which can be used and adopted to meet trade and compliance goals in the region. Second, neither APEC nor the Pacific Areas Standards Congress (PASC) develop regional standards, as their primary objective is to strengthen Asia Pacific direct participation in international standardization to meet regional and global objectives. APEC and PASC have succeeded in not developing regional standards, choosing to push towards the international standards development process wherever it may be found.

44. In the discussion it was noted that efforts to develop regional infrastructure were also taking place elsewhere. Barbados informed that, for instance, in the Caribbean region the CARICOM Regional Organization for Standards and Quality (CROSQ)[29] is currently working on a strategic plan for the development of regional quality infrastructure across its member states to build capacity and increase participation in international standards development. More specifically, currently there is a Caribbean laboratory accreditation scheme. Kenya noted that similar efforts are underway in Africa to build technical infrastructure at a regional level. The East African Community Secretariat (EAC)[30] envisages harmonized standardization removing trade barriers within the Community.

C. BENEFITS FOR COSTA RICA FROM PARTICIPATING IN THE IEC AFFILIATE COUNTRY PROGRAMME

45. Mr. Rodriguez (Costa Rica) presented on participation in the IEC Affiliate Country Program. Costa Rica joined the IEC Affiliate Country Programme in 2001 after recognizing that their industry was doubly influenced by the installations from both European and American products, sometimes with different technology. The establishment of a National Electrotechnical Committee was a challenging task. Producers and distributors of electrical material were, at first, sceptical of their country's participation in the development of standards; but they soon realized that non-participation could be just as problematic. In 2004, having benefited from the expertise of an IEC expert and trust having been established, the tide turned and Costa Rica witnessed increased success in bringing together all stakeholders. Today a sound, active National Electrotechnical Committee exists, providing a neutral forum that has credibility with interested partners, including producers and consumers, as well as Costa Rica's trading partners. The Committee also has the authority to resolve disputes.

46. The success of participation in the IEC Affiliate Country Programme provided confidence for integration into other fora, such as the Council for Harmonization of Electrotechnical Standards of the Nations of the Americas (CANENA) and the Pan-American Standards Commission (COPANT). Costa Rica's suggestion at COPANT 2008, that American IEC membership (Canada, USA, Brazil, Argentina and Mexico) encourage greater participation by affiliate members, was welcomed. Mr.

[29] Website: http://www.crosq.org/
[30] Website: http://www.eac.int/

Rodriguez identified this as an example of twinning/partnering – where mentoring countries with seniority within the International Electrotechnical Comission could provide support to newcomers. Awareness of calculability of resources is essential, he said - the IEC Affiliate Country Programme provides a unique opportunity to acquire the means to develop national standards based on international criteria.

D. CAPACITY BUILDING OF THE QUALITY INFRASTRUCTURE THROUGH TECHNICAL COOPERATION PROJECTS IN THE EURO-MEDITERRANEAN PARTNERSHIP - THE EXPERIENCE OF JORDAN

47. Ms Rula Madanat (Jordan) presented on capacity building of quality infrastructure through technical co-operation projects in the Euro-Mediterranean Partnership. She said that capacity building represented a key element in the establishment of the European Twinning Project "Strengthening of the Jordan Institution for Standards and Metrology for its Compliance with the EU-Jordan Association Agreement", financed by the European Commission and emphasizing accreditation, conformity assessment, market surveillance, standardization and metrology. The national standardization system had been upgraded in accordance with international and European rules, and procedures to enable Jordan to participate in the standards development on international and European levels had been established. The project had provided momentum and, consequently, the Jordan Institution for Standards and Metrology (JISM) joined the European Committee for Standardisation (CEN) as an affiliate member in 2008. Moreover, JISM was the first Arab standards body to partner with the Perinorm Database[31], affording Jordanian economic sectors with valid, up-to-date, and easy access to information on standards and technical regulations. Furthermore, an electronic project management system for the development of Jordanian standards was being created, allowing for monitoring procedures to commence.

48. Ms Madanat said that the Project had contributed to the development of Jordan's national quality infrastructure to support business and industrial development and underlined a commitment and obligation toward the EU-Jordan Association Agreement, fostering a climate that supports bilateral trade. Within two years, and with a total budget of €1.9 Million, the existing standards components were harmonized with international requirements and the application of European rules. Although the results achieved thus far could not be underestimated, Ms Madanat stressed that there was still some way to go and that Jordan depended on trading partners' support in order to develop and progress.

E. UNIDO: QUALITY INFRASTRUCTURE CAPACITY BUILDING

49. Mr. Gerardo Patacconi (UNIDO) noted that UNIDO is a main provider of technical assistance and advisory services to developing countries to address capacity constraints in respect of the use of international standards and technical regulations. In particular, he said that UNIDO supports: strengthening legal, institutional and human capacities and infrastructure, including at the regional level.[32] Moreover, UNIDO works with enterprises and institutions to *implement* standards and conformity assessment procedures to increase trade opportunities and overcome barriers to trade. UNIDO's work is based on strong partnership with key technical institutions, including ISO[33], IEC (as

[31] Website http://www.perinorm.com/pol/accueil.php

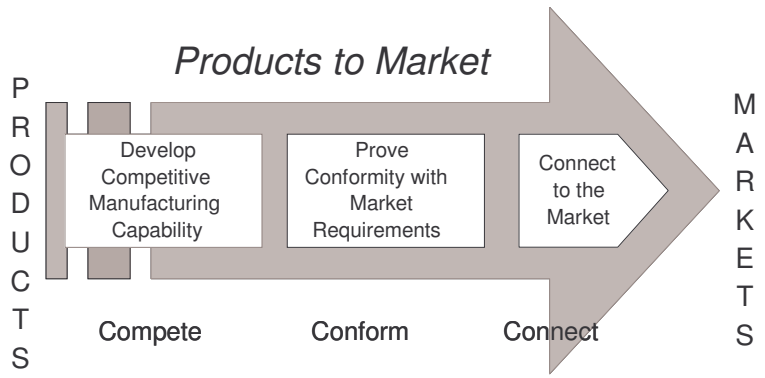
[32] This includes issues such as measurement standards; legal metrology; standards development and harmonization; material testing laboratories; certification and inspection; accreditation (of testing and inspection bodies and certification bodies); quality management; consumers and environmental protection.

[33] See, for instance the publication: "Fast Forward - National Standard Bodies in Developing Countries", a manual on helping building or upgrading standard bodies based on based on ISO and UNIDO experience in this regard, available at:
http://www.unido.org/fileadmin/ext_media/Publications/documents/fast_forward.pdf

well as other standardizing bodies) the WTO, and accreditation bodies such as the IAF and ILAC and metrology institutions such as the BIMP and OIML.

50. UNIDO's strategic Trade Capacity-Building (TCB) approach, developed to overcome supply-side and conformity constraints is aimed at achieving an increase in developing country manufacturing value added and exports by: (i) removing supply-side constraints and developing competitive manufacturing capability (compete); (ii) developing and ensuring conformity with technical and market requirements (conform); and (ii) enhancing integration with and connectivity to markets (connect) (see Figure 4, below).

Figure 4: UNIDO's "3Cs Approach"



51. Mr. Patacconi said that UNIDO actions recognize that the stage of development of the quality infrastructure in developing countries tend to reflect their general level of economic and industrial development. This, in turn, has a bearing on the efficacy of their technical regulation regimes as well as on their need to protect consumers, ensure efficiency of production and trade activities, and foster market access. UNIDO assistance focuses on global/regional/national value chains, with emphasis on agribusinesses. In terms of industrial trade policy, Mr. Patacconi noted that there had been a significant increase in demand from developing countries in respect of standards-related assistance; in particular for SMEs – a key industrial sector in need of upgrading. What is positive, he said, is that in parallel to the increase in demand there is also a clear increase in willingness from donors to provide support. This is more evident now than in the past; in fact, issues related to standards and conformity and barriers to trade are growing in importance in industrial and trade policies.

52. With respect to "private standards" Mr. Patacconi said that UNIDO has held a number of assessments and workshops on the impact of private sector standards on developing countries; in addition, a major study will be finalized in 2009. He further emphasized that UNIDO's focus is on helping suppliers and companies to *comply* with market requirements, regardless of whether they are set by the private sector or by governmental authorities.

F. WTO SECRETARIAT: AID FOR TRADE AND THE STANDARDS COMPLIANCE NEEDS OF DEVELOPING COUNTRIES

53. Mr. Michael Roberts (WTO Secretariat) recalled that, in 2007, a Global Review and three Regional Reviews of Aid for Trade had been held in Asia, Africa and Latin America and the Caribbean.[34] One conclusion which had emerged from these events was the need for continued assistance to help developing countries comply with standards commonly applied in international trade. Compliance needs, Mr. Roberts said, were considered both in the context of the need to demonstrate conformity with importing market requirements and in the context of the trade facilitation agenda. As input for the Aid for Trade events, the Standards and Trade Development Facility (STDF)[35] carried out research in three regions (East Africa, Central America and the Greater Mekong Delta Sub-region) to examine both the need for and supply of standards-related technical assistance in the SPS area. The results highlighted a number of challenges, including: multiple needs assessment; un-coordinated assistance strategies; and, more generally, a continuing need for assistance, in particular to address long-term structural weaknesses, such as – in the SPS area – the continued presence of endemic animal diseases of concern in international trade.

54. Mr. Roberts stressed the importance of mainstreaming trade and international development objectives – in other words: integrating trade into national development policies. Aid for Trade needed to help developing countries, particularly least developed countries, to build their supply side capacity and trade-related infrastructure so as to benefit from opportunities under WTO agreements and more broadly to expand their trade. The focus, hence, is on overcoming a series of supply-side constraints. The WTO's role, Mr. Roberts said, is not a funding one but rather about raising the profile of supply-side constraints. Mr. Roberts also emphasized the importance of good practice in capacity building and referred to the OECD Paris Declaration on Aid Effectiveness, signed in 2005.[36] These "Paris Principles" rely on five main themes, namely those of: ownership by developing countries, alignment of programs with national programs in the country, harmonization with other ongoing efforts by donors, managing the results and mutual accountability.

G. WORLD BANK: GLOBAL BEST PRACTICE AND STRATEGIES IN STANDARDS – ANALYTIC TOOLS TO ASSESS THE ECONOMIC IMPACT OF STANDARDS AND TECHNICAL BARRIERS TO TRADE

55. Mr. John. S Wilson (World Bank) noted that the global economic crisis is linked to a rapid decline in world trade. Global trade, one of the most powerful engines of economic growth, had been projected to fall in 2009 by approximately 9 per cent. This would be the largest decline in about 80 years, representing a threat to welfare worldwide.[37] Mr. Wilson emphasized that the crisis directly affects the poor today, as well as those who may fall into poverty prior to recovery. Action to address the crisis, including steps to assist the poor, involves a number of key issues. This includes how best to sustain momentum to achieve the Millennium Development Goals, as well as taking measures against trade protection in the form of both tariff and non-tariff measures. In fact, in times of crisis it was particularly important to take action to forestall the use of unnecessary non-tariff barriers to trade, including standards-related technical barriers to trade.

56. What is the link to standards and technical barriers apparent in today's crisis and long-term development goals? Standards, Mr. Wilson said, are an engine of trade facilitation and growth – relying on market-driven standards can help economies move out of the crisis more rapidly.

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[34] The Second Global Review of Aid for Trade will be held in Geneva on 6-7 July 2009.
[35] http://www.standardsfacility.org/.
[36] http://www.oecd.org/document/18/0,2340,en_2649_3236398_35401554_1_1_1_1,00.html
[37] Taylor, Benjamin & John S. Wilson, "The Crisis and Beyond: Why Trade Facilitation Matters," The World Bank Development Economics Research Group, Trade Issue Brief; April 2009.

Mr. Wilson emphasized that empirical analysis and best practice case studies show that private sector-led standards systems, a limited role of government in technical regulations and conformity assessment systems, and continual steps to reduce and remove technical barriers, could make a significant difference to development. Harmonization was an essential component of best practices in standards work: harmonization to international standards needed to be part of both short- and long-term capacity building programs. Recent work by the World Bank, for example, demonstrated that European Union textiles, apparel and electronics product standards that are harmonized with ISO standards exert a less negative impact on export volumes than standards that are not. This work suggests, among other points, that Africa has an important interest in dialogues on standards, as just 20 percent of EU standards for clothes are currently harmonized with international standards.[38] Mr. Wilson also emphasized quality as an important component of best practices in standards work. Standards development driven by private market forces was often led by the objective of improving quality – this was essential for developing countries looking to sustain economic growth and to remove themselves from dependency on primary products.

57. In the long-term, Mr. Wilson stressed the importance of Aid for Trade – and suggested that support under this initiative for standards and reducing technical barriers to trade should be noted. He said that institutions like the World Bank, regional development banks, bilateral donors and others were prepared to support demand-driven requests for investing in standards, an important component of the Aid for Trade agenda. In addition, as part of the overall response to the current crisis, the World Bank was prepared to triple its investment to about USD100 billion over the next three years in projects, lending and technical assistance. This includes potential projects with a focus on standards and based on clients' demands. Mr. Wilson further noted that new analysis was underway in the World Bank's Research Department examining the impact of various channels of Aid for Trade on trade facilitation goals. Preliminary results from this work suggested that Aid for Trade targeted at trade policy and regulation had a higher rate of return on investment in comparison to other types of Aid for Trade.

IV. IDENTIFICATION OF KEY CHALLENGES

58. The Chairperson of the TBT Committee, Ms Xueyan Guo (China), noted that at the outset of the Workshop, participants had been presented with a synopsis of current work on the topic of standards, trade and economic growth. In particular, based on studies undertaken in Germany, the United Kingdom, Canada, Australia and China, participants heard expert views from both academia and governments on the benefits and costs of standardization activities – and efforts to quantify these. The essence of the findings of various studies presented show that standards, as a pool for technological know-how, can contribute positively to economic growth. Standards promote innovation and technical progress and are an important instrument to facilitate competition in markets and transfer of technology. These benefits, however, remain difficult to quantify and need to be better understood, both in qualitative and quantitative terms. More research is therefore needed, also with respect to aligning methodologies and assessment tools. Participants were urged to circulate widely any case studies on the impacts of standards, regardless of methodologies used.

59. Ms Guo said that participants had reflected on the relevance of standards to the crisis affecting the global economy. It had been pointed out that in times of crisis it is ever more important to ensure that standards are not used for protectionist purposes. Instead, standards should be seen as an opportunity. For instance, well crafted standards, as the basis for regulatory measures, may increase confidence in markets and serve to boost trade. As well, standards are an important link between research, innovation and markets; in effect, an efficient tool for the transfer of technology.

[38] Czubala, Witold, Ben Shepherd, and John S. Wilson. 2007. "Help or Hindrance? The Impact of Harmonized Standards on African Exports." Policy Research Working Paper 4400, World Bank, Washington, DC.

For companies in particular, participation in standardization processes could potentially compensate for a downturn in R&D spending. This is particularly important today in the areas of sustainability and environmental technology.

60. To stay relevant, standards need to be maintained: they have to be up-to-date with current technology and science – they should not lag behind technology. Science does not stay still. Timing is therefore important. Standards that arrive too late can lock in old technology and be counter-productive in terms of innovation.

61. During the Workshop, a number of practical case studies that illustrate how the use of standards has contributed to economic and social development, in particular in developing countries, were presented and discussed. For instance, in the agricultural sector, participants heard how international standards have been used to increase exports of asparagus and coffee from Peru. Egypt illustrated how the adoption and use of international standards in general had facilitated trade, leading to increases in both imports and exports. Participants heard how Pakistan's textile sector had increased exports subsequent to the use of international quality standards. There were also other benefits to the use of standards. The case of the US-Brazil cooperation to develop testing and measurement methods on biofuels, and the application of Chilean standards on energy efficiency showed how standards can contribute to address global environmental challenges. Standards can also successfully address public safety issues, as illustrated by Colombia in the presentation on building codes and construction. Kenya's experience showed how the adoption of international standards in the electrotechnology field had contributed to improvement in the quality and safety of *imported* products. Ms Guo noted that a common element in several of the cases presented was the importance attributed to collaborative work between the public and private sectors; government support for standardization activities is considered important, particularly in developing countries. It is also important, she said, to have the absorptive capacity to implement standards (not only participate in their development), and, sometimes, to tailor them to local or regional circumstances.

62. Participants considered efforts to address developing country capacity constraints in respect of the use of international standards. Clearly, participation in international standards-setting activities is considered essential and remains a constraint. In this respect, several initiatives by international standardizing bodies, regional bodies, bilateral donors and other international bodies, such as UNIDO, to increase participation were mentioned. Kenya suggested that developing countries should, to a greater extent, be hosting working groups and technical committees developing standards. However, it was also pointed out that participation in and of itself serves no purpose: it has to be effective. Building expertise in developing countries and filling information gaps has to be done in ways that reflect the needs of each individual country.

63. Several participants expressed concern about the proliferation of private standards that could result in unnecessary barriers to trade that created confusion in the market place. It was pointed out that initiatives existed and were underway in other organizations, such as UNIDO, to help countries comply with such schemes, and that the issue was also being addressed in the WTO SPS Committee.

64. The importance of identifying best practices for technical cooperation in the standards-setting field was stressed. Aid effectiveness meant that Aid for Trade in the standard-setting world has to be driven by needs, be sector-specific and include the effective participation of all stakeholders. As an example of Aid for Trade applied to standards, the relevant work of the Standards and Trade Development Facility (STDF) in the SPS area was presented.

65. Ms Guo said that many key challenges remain with respect to standardizing activities. In her capacity as Chair, she stressed the following:

(a) **Quantifying the benefits of standards**: The studies and experiences shared at the outset of the Workshop show the significant positive role standards can play in promoting innovation and technical progress. The use of standards makes production more efficient. Yet measuring and expressing (numerically) the benefits of standards remains a key challenge. Members were encouraged to use the TBT Committee to share case studies on the economic benefits of the use of standards.

(b) **Involving all stakeholders**: Creating awareness among all relevant stakeholders, including SMEs, of the importance of being involved in standard-setting activities is crucial. Broad stakeholder involvement ensures an open and transparent process, in line with the disciplines on standardizing bodies contained in the TBT Agreement. On various occasions during the Workshop, speakers and participants pointed out that government support and involvement in standardization is important, particularly in developing countries – where standardization may not always be given priority and the strategic importance of standards is not always appreciated. It is important to find incentives to increase support and promotion of standardizing activities in developing countries.

(c) **Participation in international standard-setting activities:** Actual participation in standards-setting activities by developing countries remains a challenge, both financially and technically. Only a small proportion of developing countries are responsible for the management of working groups and technical committees, where the nuts and bolts of international standardization work takes place. Although participants had heard of various initiatives, finding effective ways of increasing such participation remains a challenge. It was pointed out that an essential component of making participation effective at the country level is a two-way exercise. On the one hand – at the national level – it is important to raise levels of expertise in selected areas of importance to the participating developing country. And, on the other hand – at the international level – it is important to engage that local knowledge and expertise in the international standard-setting community.

(d) **Building up standards-related infrastructure:** Standards development is part of a bigger whole – that of a quality infrastructure including: metrology, standards development and conformity assessment activities, including accreditation. It is not obvious that all components of this infrastructure are needed everywhere; for instance, it was pointed out that in the Caribbean, efforts are underway to build quality infrastructure at the regional level. It is important that countries prioritize and are selective about where efforts to build capacity should be concentrated.

(e) **Importance of transparency:** In this time of economic crisis, Members of the TBT Committee needed to guard against cases where standards could be used as a basis for unnecessary non-tariff measures. Continued effective use of TBT transparency provisions is crucial in this respect. WTO Members also need to reinforce and boost the beneficial, confidence-building aspects of standards. The use of international standards should serve the purpose of facilitating international trade, as envisaged in the WTO TBT Agreement.

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ANNEX 1: PROGRAMME AND BIOGRAPHIES

TBT COMMITTEE WORKSHOP ON THE ROLE OF INTERNATIONAL STANDARDS IN ECONOMIC DEVELOPMENT

16-17 March 2009

Programme[1]

16 March 2009

Registration (08h30 – 10h00)

10h00 **Opening Remarks**

WTO Deputy Director-General, Mr. Harsha V. Singh

Session 1: The economics of standardization (Panel)

The aim of this panel is to provide an overview and perspective of current work on the topic of standards, trade and economic growth. Expert interventions have been sought from Member governments, standardizing bodies and relevant international bodies. Panellists will be asked to address the following questions in particular:

- The difficulty of quantifying welfare effects of standardization is known; given this, what can be said today about the importance of standardization to economic development and trade?
- How do standards contribute to innovation and technical progress?
- What is the current state of research on quantifying the economic impacts of standards? Is there a harmonized assessment methodology?
- Is there sufficient appreciation of the importance of standards development work, particularly in developing countries?

Moderator: **Mr. John Tucker**, Australia

Panellists:

- **Prof. Dr. Knut Blind and Mr. Heinz Gaub**, European Communities: Studies on the economic impact of standards in Europe
- **Mr. Rengang Huang**, China: Standards and Technology Diffusion
- **Mr. Stephen Head**, Canada: The value of standards to the Canadian economy
- **Prof. Dr. Manabu Eto**, Japan: The value of standardization for innovation
- **Mr. Eho-Cheng Lo**, Chinese Taipei: Quantitative assessment
- **Dr. Hyang Sun**, Republic of Korea: Analytic Tools Development on the Economic Impact Assessment of Standards/Standardization Projects in the Republic of Korea

[1] The Programme is also contained in document G/TBT/GEN/80/Rev.1.

Session 2: Case studies on the use of international standards (Presentations)

The focus of this session is on cases / experiences illustrating how the use of standards has contributed to economic development. The selection of cases is intended to reflect topics of interest to developing countries. The following brief presentations will be made (10 minutes each):

Moderator: **Mr. Michel Jeanson,** European Communities

Presentations (10 minutes each):

- Coffee and Asparagus (two cases): impact of standardization (**Mr. Augusto Mello**, Peru)
- Textiles: the use of standards in the textiles sector and challenges to SMEs (**Mr**. **Muhammad Muzzammil Hussain** and **Mrs. Aisha Humera Moriani**, Pakistan)
- Biofuels: the use of standards in the biofuels sector (**Mr. Jorge Cruz**, Brazil; and the United States)
- Building Codes and Construction: The use of international standards in the area of public safety (**Mr. Manuel Lascarro**, Colombia)
- Lamps and Refrigerators: The use of standards for energy efficiency (**Mr. Jorge Muñoz Canave**, Chile)
- Impact of Harmonization of national standards with international standards: (**Ms Samia El Azazy**, Egypt)
- Standards in the area of electrotechnology: The Kenyan experience (**Mrs. Evah Oduor**, Kenya)

17 March 2009

Session 3: Building capacity (Panel)
(10h00)

The purpose of this panel is to discuss ongoing efforts to address developing country capacity constraints in respect of the use of international standards. Panellists will be asked to address the following issues in particular:

- The efficacy of existing efforts to promote and enhance participation of developing countries in international standard-setting activities, for instance through schemes such as "twinning" (in the ISO) or other forms of participation (such as the IEC's "Affiliate Programme").
- Work done at the international or regional level to build capacity, particularly with respect to conformity assessment infrastructure (e.g. metrology, laboratories, certification capacity and accreditation).
- Relevant work on aid-for-trade in the WTO and the activities of the SPS Standards and Trade Development Facility (STDF).

Moderator: **Ms Ileana Márquez Martinez,** United States

Panellists:

- **Mr**. **Fabio Tobón**, Colombia: "Twinning"
- **Mr. Gary Kushnier,** U.S.: Technical infrastructure development in APEC
- **Mr. Carlos Rodriguez**, Costa Rica: Benefits for Costa Rica from participating in the IEC Affiliate Country Programme
- **Ms Rula Madanat**, Jordan: Capacity Building of the Quality Infrastructure through Technical Cooperation Projects in the Euro-Mediterranean Partnership -The experience of Jordan
- **Mr. Gerardo Patacconi**, UNIDO: Quality infrastructure capacity building
- **Mr. Michael Roberts**, WTO Secretariat: Aid for Trade and the Standards Compliance Needs of Developing Countries
- **Mr. John S. Wilson**, World Bank: Global best practice and strategies in standards

Session 4: Identification of key challenges

The final session will draw from the previous discussions to identify key challenges for developing countries, and discuss ways of addressing them.

BIOGRAPHIES

Session 1: The economics of standardization (Panel)

John Tucker (Australia)

Mr. Tucker joined Standards Australia as Chief Executive Officer in 2004, following a diverse career path traversing public and private sectors, and political advising. Established in 1922, Standards Australia is a company recognised by the Australian Government as the peak non-government standards development and approval body in Australia. Mr. Tucker's background is in health surveillance, occupational hygiene and industrial relations. An experienced company director and Member of the Australian Institute of Company Directors, he formerly held statutory appointments in the fields of health and safety and workers' compensation. He has held CEO positions in the fields of injury and risk management and industry association management. Mr. Tucker's qualifications include a Bachelor of Applied Science in Environmental Health.

Knut Blind (Germany)

Prof. Blind has been a Senior Researcher at the Fraunhofer Institute for Systems and Innovation Research at Karlsruhe since 1996. In 2006 he was appointed Professor of Innovation Economics at the Faculty of Economics and Management, Berlin University of Technology, and Head of the Competence Center "Regulation and Innovation" of the Fraunhofer Institute. He has held the endowed Chair of Standardisation at the Rotterdam School of Management, Erasmus University, since 2008. Prof. Blind, a graduate of Brock University (Canada) and Freiberg University, has published numerous articles on standardisation and intellectual property rights.

Heinz Gaub (Germany)

Mr. Gaub joined the Management Board of DIN, the German Institute for Standardization with responsibility for standardization process management, in 2007. He has some 17 years of industrial experience, most recently with Willy Vogel AG, the world's leading supplier of centralized lubrication technology for machinery, systems, commercial and railway vehicles, where he was a member of the Management Board for over six years. Mr. Gaub studied mechanical engineering at the Technical University of Berlin, specializing in production technology, and also studied at the Massachusetts Institute of Technology (MIT) in Cambridge (USA), where he obtained a Master of Science.

Rengang Huang (China)

Mr. Rengang Huang is Minister Counsellor, Permanent Mission of China to the World Trade Organization, Geneva. He has years of experience in international trade negotiations, including the ongoing WTO Doha Round. His current responsibilities cover mainly the areas of trade in goods, including agriculture, market access, sanitary and phytosanitary measures, technical barriers to trade, import licensing measures, and trade-related investment measures. He has experience in attending standards and trade-related seminars and has extensive contacts with a variety of stakeholders, including some NGOs on open standards to promote economic and trade development. Before 2002, he worked for the Ministry of Foreign Trade and Economic Cooperation of China, and took part in the development of some foreign investment and trade policies of China. He holds an M.A. degree from the University of International Business and Economics, Beijing, China and an MBA from Cardiff Business School, University of Wales, UK.

Stephen Head (Canada)

Mr. Head is a Senior Policy Analyst in the Intergovernmental Affairs and Trade Branch of the Standards Council of Canada. His current responsibilities for the Standards Council include monitoring the files of the WTO Technical Barriers to Trade Committee, the APEC Sub-Committee on Standards and Conformance, as well as a number of other trade policy issues in the field of standardization. He provides policy advice and analysis on the international, national and regional implications of a broad range of regulatory, trade and standardization policies, initiatives, programs and practices. His research interests are international trade policy and regulatory cooperation.

Manabu Eto (Japan)

Dr. Eto is a Professor at the Institute of Innovation Research, Hitotsubashi University and Consulting Fellow at the Research Institute of Economy, Trade and Industry. He joined the Ministry of Economy, Trade and Industry after gaining his M.E. Dr. Eto has worked for the Science and Technology Agency, the National Institute of Advanced Industrial Science and Technology and the OEC and for over 20 years has predominantly been engaged in the field of technology transfer, management of technology, and standardization at these organizations. Dr. Eto is author and co-author of several books and articles, including: "Strategic Use of Consensus-based Standards" and "Business Strategy in the Standardization of Semiconductor Equipment and Optical Connectors". He organized the study group on the economic and social effects of standardization, which analyzed the value of standardization through examining case studies (e.g., DVD-associated equipment, electronic components, raw materials). Dr. Eto gained his B.E. in Engineering Science at Osaka University, a M.E. in Engineering Science at Osaka University, and a Ph. D in Engineering Science at Tohoku University.

Eho-Cheng Lo (Chinese Taipei)

Mr. Lo is Deputy CEO of a technology policy research think-tank in Chinese Taipei. Over a period of ten years in the field of standardization, he has served in various capacities, including on the Technology & Standards Function Team as Commissioner. At the technical level, Mr. Lo initiated and established Chinese Taipei's first online collaboration platform for standards development, and the registry and repository for XML-based standards. In the policy domain, he is the main drafter and the Editor-in-Chief of Chinese Taipei's strategy for standards development, as well as the Blueprint for Standardization Education. Mr. Lo has several degrees, including an MS in Management Science & Engineering at Stanford University (USA), and an MPhil in Technology Policy at the University of Cambridge (UK) as a Chevening Scholar awarded by the British Council. Mr. Lo is author and co-author of several books, including: "Asia PKI Interoperability Guidelines, The Fundamentals of Standardization" and "The Winning Standardization Strategy for Enterprises". His areas of interest and research include technology foresight applied to standardization, standards in a sustainable infrastructure, and the synergy between R&D, standardization and commercialization.

Hyang Sun (Republic of Korea)

Dr. Sun is the Deputy Director of the Standards Policy Division of the Korean Agency for Technology and Standards (KATS), which represents the Republic of Korea in the ISO and IEC. His career began as a Governmental Officer in 1993 and he has been working in the international standardization and policy field since 1999. He has served as the KATS Liaison Officer to ISO and other international bodies for several years and was Secretary of the ISO Technical Committee 224 Working Group for two years. Dr. Sun received his Philosophy Degrees (Engineering Major) from Inha University and completed his post-Doctoral studies at the National Institute of Standards and Technology, USA.

Session 2: Case studies on the use of standards

Michel Jeanson (European Communities)

Mr. Jeanson, who joined the European Commission in 2004, is in charge of horizontal policy issues in the Standardisation Unit of DG Enterprise and Industry. His duties involve the representation of the Commission's services on the Administrative Boards of CEN[2], as well as in the General Assemblies of CEN and CENELEC.[3] Mr. Jeanson was involved in the preparation of the Commission Communication published in March 2008 entitled "Towards a greater contribution of standardisation to innovation in Europe". He is currently heavily involved in the reform process of European standardisation, and manages the study on "Access to Standardisation". He is also responsible for international standardisation cooperation, especially with Russia and the United States, as well as international organisations. His 20 years' experience in standardisation was acquired in various positions, beginning with the French Standards Institute (AFNOR) as Technical Officer, becoming secretary of national, European and international technical committees dealing with food standards. He joined the European Committee for Standardisation (CEN) in 1991, where he was responsible for food and environmental protection standardisation and further occupied various functions. In 2002 Mr. Jeanson joined Eurometaux, the industrial trade federation of the European non-ferrous metals industries, as Health and Safety Manager, taking up the challenge of the creation of the European Environmental Citizens Organisation for Standardisation (ECOS). Mr. Jeanson was chosen by Environmental NGOs as the first Secretary General of ECOS, representing environmental protection organisations within the standardisation organisations for two years.

[2] European Committee for Standardisation.
[3] European Committee for Electro-technical standardisation.

Augusto Mello (Peru)

Mr. Mello is the Director of the Peruvian Standardization and Accreditation Body (INDECOPI), a position he has held for the past 12 years, and Head of the National Accreditation Service. From 2000 to 2004 he served as Vice President of the Inter-American Accreditation Cooperation (IAAC) and in 2008 was Chairman of the APEC Sub-Committee of Standards and Conformance. Mr. Mello graduated from the Pontifical Catholic University of Peru and gained his Master of Arts in Economics from Ilades-Georgetown University, Santiago.

Aisha Humera Moriani (Pakistan)

Mrs. Moriani is the WTO Economic Counsellor at the Permanent Mission of Pakistan, Geneva, who is responsible for Agriculture, Trade and Development, Safeguards, SPS and TBT related matters. Before joining this Mission she was the Director of the Economic, Trade and Investment wing of the Agriculture Ministry. Mrs. Moriani has a MSc. in Development Management from the London School of Economics and is an experienced civil servant with a diverse experience. She started her carrier with Economic Affairs Division in the Ministry of Finance where she worked with various organizations on issues related to effective utilization of foreign assistance. She has also served as a Director in the Trade Promotion Authority, as well as in the Ministry of Commerce, and participated in several bilateral and regional trade negotiations.

Muhammad Muzzammil Hussain (Pakistan)

Mr. Muzzammil Hussain is a progressive businessman who has been associated with the textile industry for the past 20 years. He has, among other things, served as Chairman of the Towel Manufacturers Association (TMA) of Pakistan and Advisor to the Minister of Transport, Government of Sindh (Provincial Government). He currently holds the post of Chairman in several organizations, including the Managing Committee of the Karachi Chamber of Commerce & Industry (KCCI). As well, he is the Senior Director of the SMA Rizvi Textile Institute, Karachi and the Executive Director of Shahi Textiles, Karachi. He has a keen interest in corporate social responsibility, skill development and quality control systems.

Jorge Cruz (Brazil)

Mr. Cruz is the General Coordinator of International Affairs at the National Institute of Metrology, Standardization and Industrial Quality (INMETRO). His responsibility is for International Relations (bilateral and multilateral) and he is predominantly involved in Scientific and Technological Cooperation Agreements, Memoranda of Understanding, Intention Protocols, Regional and International Negotiations and Technological Innovation. Mr. Cruz is an INMETRO representative in fora and organizations such as the WTO and Mercosur. He has degrees in Mechanical Manufacturing Engineering and Mechanical Engineering from Santa Ursula University, and a Masters in Technology from the Federal Technological Education Center, Rio de Janeiro.

Manuel A. Lascarro (Colombia)

Mr. Lascarro is the Director of Special Projects at the Colombian Ready Mixed Concrete Producers Association (ASOCRETO). He manages activities related to competitiveness, environmental issues, and legal affairs and is also responsible for the ASOCRETO concrete housing promotion program. Mr. Lascarro has broad experience in international standardisation issues, from active involvement in technical standards committees to membership on the board of directors of ASTM International, a leading standards development organization. In addition, he serves as Executive Secretary of the Iberoamerican Federation for Ready Mixed Concrete (FIHP), an organization of concrete trade associations in Latin America whose membership includes partner organizations from Spain and

Portugal. In this role, Mr. Lascarro encourages international cooperation among national and regional trade associations in Europe and the Americas to raise awareness of the ready mixed concrete industry and improve its effectiveness. He also serves on the editorial boards of two construction industry magazines in Colombia, *Noticreto* and *Mineria Colombia*. Mr. Lascarro gained his Industrial Engineering Degree from Pontificia Universidad Javeriana, Bogota. He also holds a Master's Degree in Private Development and Project Finance from the Fundación Antonio Camuñas, Universidad San Pablo CEU, Madrid.

Jorge Nestor Muñoz Canave (Chile)

Mr. Muñoz is Project Manager for the Innova project "Support for the Electrical Product and Fuel Certification System" of the Chilean Production Development Corporation (Corporación de Fomento de la Producción – CORFO). CORFO's aim is to develop standards and protocols for electrical, gas and kerosene products for regulatory certification. He is responsible for the preparation, drafting and approval of technical standards in the area of information technologies, such as the security and privacy of electronic documents, for incorporation in the Regulations to the Law on Electronic Signatures, and for the development of other standards for CORFO and Inter-American Development Bank (BID) projects on traceability and photovoltaic energy. His previous work experience was with NEC Chile SA, Under-Secretariat of Telecommunications, Manquehue Telephone Company, National Petroleum Company and Telefónica CTC, Chile. Mr. Muñoz graduated as an Electronics Engineer from the Federico Santa Maria Technical University of Valparaíso, Chile.

Samia El Azazy (Egypt)

Eng. El Azazy is the Manager of the Standards Harmonization Project in the Egyptian Organization for Standardization and Quality (EOS) and a Member in Egyptian Enquiry point and the Egyptian TBT Committee in EOS. She holds a B.Sc. in Mechanical Engineering and a diploma in quality, and has more than 30 years experience in the fields of standards, technical regulations and conformity assessment activities. She served as General Manager of the Quality Department in the Ministry of Trade and Industry, and as Technical Director in Egyptian Accreditation Council for about 10 years. She has represented Egypt in many international, European and regional conferences and workshops on issues concerning standardization and accreditation. Moreover, Eng. El Azazy is an Advisor and lead Examiner in the Egyptian National Quality Award for Excellence for both the governmental service institutions and the industrial organizations.

Evah Adega Oduor (Kenya)

Ms Oduor is the Director of Standards & International Trade with the Kenya Bureau of Standards. She has almost 30 years experience in standardisation, conformity assessment and metrology. Ms Oduor has participated in several trade negotiations and is active in the East Africa Community (EAC) and Common Market for Eastern and Southern Africa (COMESA) regions on issues of standardisation and conformity assessment. She is the Vice President of the Africa Electrotechnical Standardization Commission (AFSEC) on Conformity Assessment and is the IEC Affiliate Coordinator for Africa. Ms Oduor gained her Master of Science Degree in Biochemistry from the University of Nairobi.

Session 3: Building capacity

Ileana Márquez Martínez (United States)

Ms Martinez is Acting Group Leader of the Global Standards and Information Group at the National Institute of Standards and Technology (NIST) and serves as International Affairs Advisor to the National Voluntary Laboratory Accreditation Program (NVLAP) at NIST and is Vice Chair of the Inter American Accreditation Cooperation (IAAC). Her expertise focuses on the US approach to standards, regulations, certification, laboratory accreditation and WTO trade obligations. From 1996 through 2000, she served as the NIST Regional Standards Attaché in South America, with standards-related responsibilities for the region. She has worked as a Standards Engineer in industrial sectors for both U.S. and overseas organizations, spending eight years at AFNOR, the French national standards body. Ms. Martinez earned a bachelor degree in Mechanical Engineering, did graduate work in Science/Technology Policy and is a recipient of a 2001 Bronze Medal from the Department of Commerce for contributing to NIST efforts in standards and conformity assessment outreach and of a 2004 ANSI Meritorious Service Award.

Fabio Tobón (Colombia)

Mr. Tobón is the Executive Director of the National Standards and Certification Body of Colombia (ICONTEC). With more than 16 years experience in Standards and Conformity Assessment, Mr. Tobón has been a member of the Board of Directors and the Technical Management Board (TMB) of the International Organization for Standardization (ISO). He is also a member of the Board of Directors of the Pan-American Standards Organization (COPANT) and a former member of the BoD of ASTM International. An Agronomist from the Universidad Nacional in Bogota, Colombia, he received his Masters Degree in Agricultural Engineering and Administration at the University of Minnesota.

Gary Kushnier (United States)

Mr. Kushnier has held the post of Vice-President of International Policy at the American National Standards Institute (ANSI) since 1995. His primary responsibility is for overall liaison and policy coordination of ANSI's activities with international and regional organizations, as well as national member bodies. ANSI is a not-for-profit membership organization that brings together organizations from both the private and public sectors dedicated to furthering US and international voluntary consensus standards and conformity assessments. ANSI accredits national standards developing organizations and approves American National Standards and is the sole US representative to the International Organization for Standardization (ISO) and, via the US National Committee, the International Electrotechnical Commission (IEC). Prior to his current appointment he served as Vice President of ANSI's Brussels Office, where he worked closely with various European standards organizations during the early years of the formation of the European Union. Currently he serves as Chair of the PASC Executive Committee and as staff liaison to the ANSI International Policy Committee. Mr. Kushnier received his Bachelor of Science degree from Kean College, New Jersey.

Carlos E. Rodríguez (Colombia)

Carlos E. Rodríguez has been the Executive Director of the Costa Rican Technical Standards Institute (INTECO) since 1996. He is currently also the ISO Regional Liaison Officer for Central America and the Caribbean and the Leader of the IEC Affiliate Country Programme. As well, Mr. Rodríguez is a member of the Board of Directors of the Costa Rican Accreditation Authority (ECA) and the Director-General of the Inter American Development Bank (IDB)/Multilateral Investment Fund (MIF) project on "SME Competitiveness through Technical Standardization". From 2003 to 2005, Mr. Rodríguez was President of the Pan American Standards Commission (COPANT). Mr.

Rodríguez graduated from the University of Costa Rica and obtained a Masters in Policy Development and Evaluation from the Getulio Vargas Foundation. He is also professor at the Faculty of Economics of the University of Costa Rica.

Rula Madanat (Jordan)

Ms Madanat is Assistant Director General for Technical Affairs at the Jordan Institution for Standards and Metrology (JISM). She has held several technical and managerial positions with JISM for the past 21 years. She was Team Leader for the "European-Jordan Twinning Project for Strengthening JISM" and twice headed JISM's team for the King Abdullah II Award for Government Performance and Transparency. In addition to her knowledge of the WTO TBT and SPS Agreements, Ms Madanat possesses substantive practical experience in the areas of standards, technical regulations and conformity assessment procedures. She has represented Jordan in many international, European and regional meetings, conferences, and workshops on issues concerning trade and technical barriers. For instance, she was a member of the Jordanian negotiation delegation of the Free Trade Agreement with the USA and Canada. Ms Madanat is a certified Management Development Expert under the Certified Trade Advisors Program of the International Trade Centre (ITC), European Quality Auditor and European Quality Systems Manager, certified by the European Organization for Quality (EOQ). Ms Madanat holds a B.S. in Chemical Engineering from the University of Jordan.

Gerardo Patacconi (UNIDO)

Mr. Patacconi is Chief, Quality, Productivity and Enterprises Upgrading, UNIDO Trade Capacity Building Branch, and focal point for cooperation with ISO and the WTO/TBT. Holder of a high-level degree in Statistics and Management Science, he was awarded European Young Scientist in Operational Research in 1984. He has contributed to the development and implementation of the UNIDO Trade Capacity Building Approach. Over recent years he has focussed on the implementation of large-scale national and regional industrial restructuring and upgrading programmes and food traceability. After joining UNIDO in 1987, he has carried out research work and directly extended technical assistance and training to industries and quality-related institutions to over 80 developing countries. Mr. Patacconi is an ISO 9000 and ISO 14000 Lead Auditor and a trained Total Quality Management Specialist.

Michael Roberts (WTO)

Mr. Roberts is a Counsellor in the Development Division. He was appointed Aid for Trade Coordinator at the WTO Secretariat in January 2009. Prior to joining the Development Division, Mr. Roberts spent seven years with the Agriculture Division, the majority as Secretary of the Standards and Trade Development Facility (STDF). During this time, he oversaw the evolution of the STDF into a multi-donor Trust Fund with 16 donors and annual resources of approximately US$5 million. The STDF is a funding and co-ordination mechanism which assists developing countries comply with sanitary and phytosanitary measures.

John S. Wilson (World Bank)

Mr. Wilson is a Lead Economist in the Development Economics Research Group of the World Bank, directing policy research on trade facilitation, standards, regulatory reform, and economic development. Providing expertise in lending operations and participating in Bank projects, he has provided leadership for the World Bank establishment of the inter-agency Standards and Trade Development Facility. A member of the World Economic Forum Global Agenda Council on Trade Facilitation, he is co-author of numerous publications, including "Help or Hindrance? The Impact of Harmonized Standards on African Exports", "Trade, Transparency, and Welfare in the Asia Pacific" and "Standards and Export Decisions: Firm-level Evidence from Developing Countries." Work in

progress includes "Aid for Trade Facilitation: Does it Matter?" Previously Vice President for Technology Policy at the Information Technology Industry Council in Washington, D.C. and a Visiting Fellow at the Institute for International Economics, he was also a Senior Staff Officer at the U.S. National Academy of Sciences and National Research Council and Adjunct Professor of International Affairs at Georgetown University. He holds degrees from Wooster College and Columbia University in New York.

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