Scene from standard committee chairmen's meeting under coordination of European Commission

Interview

International Standardization and Global Environmental Strategy

The 21st century has brought a transformation in the circumstances surrounding business and the environment. Action on the environment that in the 1990s was undertaken by companies that took issues like environmental protection and CSR seriously has now become an important aspect of managing a business. Given these circumstances, an international standardization strategy is essential to a global environmental business. So why is a proactive approach to international standardization now so important in the environment sector? Senior Chief Engineer Yoshiaki Ichikawa is directly involved in standardization work and we spoke with him about Japan's and Hitachi's strategy for standardization in the environment sector.

Environmental Fitness of Products Creates Business Opportunities

THE year 2000 brought a major change in the background against which environmental businesses operated with product regulations starting to incorporate environmental considerations rather than just safety as in the past. Although the attitude of most companies at that time was that, like safety standards, compliance with these environmental regulations was all that was needed, this changed when certain companies started making skillful use of these environmental regulations.

Yoshiaki Ichikawa offers lighting products as a good example of this process. "The predominant technology has shifted from incandescent to fluorescent and now to LED (light emitting diode) lighting and the impetus for these changes came from the world's leading lighting

manufacturers. Unable to win against global price competition in incandescent lighting which does not require high technology, they seized on the environmental benefits of fluorescent and LED lighting and lobbied for regulation of power-hungry incandescent lightbulbs. Lighting makes up about 20% of global electricity consumption and their claim was that such regulation was essential if this energy use was to be reduced. These efforts proved successful with production of incandescent lightbulbs being halted or their use prohibited in a growing list

Yoshiaki Ichikawa
Senior Chief Engineer
Environmental Strategy Office
Hitachi, Ltd.

of countries while the market for more expensive forms of lighting such as fluorescent and LED expanded."

This story is now being repeated for a range of other products. One example is a television that automatically turns itself off if left on for longer than a fixed time. While an automatic power-off function is an essential feature in an eco-product, the key to competitiveness lies in each manufacturer's innovations and technological capabilities so that, rather than just turning the power off, the television set is able to detect whether anyone is watching it and use this information to make an autonomous decision about whether to turn on or off. Furthermore, what is needed is not just the development of products with superior environmental performance but also a strategy that can identify global trends like the aforementioned case of the lighting industry.

"Whereas Japanese refrigerators use frost-free indirect cooling," says Ichikawa, "non-frost-free foreign models could potentially achieve better results under the performance testing conditions stipulated in the previous European standard. In response, the Japan Electrical Manufacturers' Association proposed a new international standard measurement procedure and lobbied to make the measurement process fairer for refrigerators that use indirect cooling. Rather than just passively accepting environmental fitness in the form of regulation, it is necessary to treat it as something that can be actively utilized in business strategy.

"Because Japan produces many products with excellent environmental performance, paying heed to standards and having laws that comply with them are effective ways to extend our global competitiveness."

Creating Practices Rather than Technologies
Strategies that Generate Added Value

In broad terms, standardization strategy can be divided into two halves.

The first is the standardization of superior technology so that it will be widely adopted. However, a consequence of this approach is that, once it has been standardized, a technology becomes open and this makes it difficult to differentiate from one's competitors. Accordingly, the question becomes a difficult one of which aspects of the technology to standardize and which to protect with patents. The second strategy, in contrast, takes the different approach of standardizing indirect practices that benefit the technology such as measurement procedures.
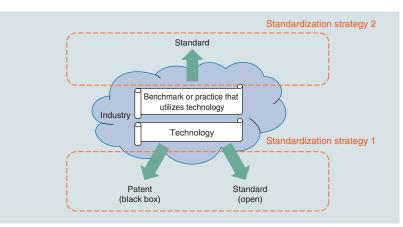
"Although this latter approach of

standardizing practices is difficult to get started," says Ichikawa, "once underway the rest is easy. The standardization of practices shows its value in the environmental sector especially where it is a particular stance that is called for rather than technology as such. An increasing number of the people involved with standardization in Japan have recently come to realize this point and to take advantage of it. At Hitachi, Ltd., the International Standardization Office in the Intellectual Property Group in particular is doing a lot of work on the standardization of practices."
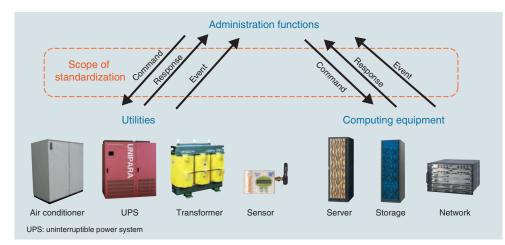
International standards were initially established mainly to ensure "consistency of specifications" which means things like compatibility between parts or a basic level of quality assurance, primarily through multilateral negotiations in Europe. Accordingly, it sometimes happened that products equipped with advanced technologies unique to Japan were shut out of markets by the very thing that made them special. That is, one aspect of standardization is that it may devalue Japan's superior technology.

Meanwhile, "obtaining international agreement" is another major role of standardization. The impartiality of the standardization processes conducted by three agencies in particular, the International Organization for Standardization (ISO), International Electrotechnical Commission (IEC), and International Telecommunication Union (ITU), has seen these recognized as official international standards bodies by the World Trade Organization (WTO) and it is not uncommon for standard practices approved by these agencies to be incorporated into the law. That is, rather than the technically oriented standards that stipulate common specifications, it is standards that deal with the formulation of practices used in society that in certain respects have greater impact.

Ichikawa comments that, "Technical standardization often brings the interests and claims of different countries into direct

Overview of two standardization strategies

Optimization achieved through the interoperation of utilities and computing equipment is the key concept in smart data center standardization.
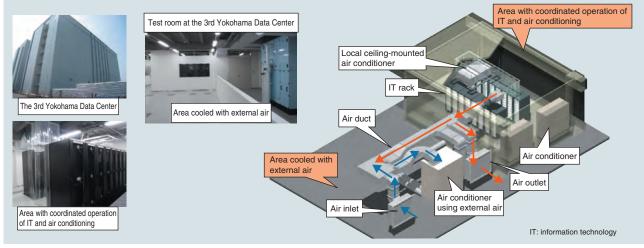
conflict with each other, with the end result being influenced by negotiating strength, debating skill, and the power relationships among companies. Because negotiations are conducted in English, Japan is at something of a disadvantage. Although it is increasingly common for companies to join together as a consortium that can present a common front for Japanese interests in a negotiation, the current situation is a difficult one. In the case of international standards that deal with establishing practices, however, negotiations often proceed comparatively smoothly because it is easy to find mutual benefits and maintain a spirit of fairness.

"In fact, Japan's strength in technology also comes into play in the very process of establishing practices. One example is the flush toilet. The standard for water-saving toilets set by the United States Environmental Protection Agency stipulates a flush volume of 4.8 L to be awarded an eco-label and this same quantity is used by Japanese toilets. However, the measurement method specified by the US federal government is not necessarily appropriate for products from

other countries. While I believe that our position needs to be better backed up, relating as it does to the evaluation of the cleaning effect of each flush, by creating more realistic evaluation criteria for flush toilets we should be able to demonstrate to the world the environmental fitness and high level of technology of Japanese toilets."
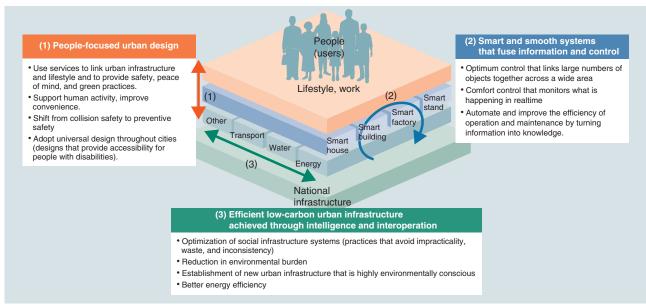
Putting Comprehensive Technical Capabilities to Work in Smart Data Centers

The following sections look at some specific examples in which Hitachi is involved.

The first activity in which the International Standardization Office in the Intellectual Property Group became involved after its formation was the standardization of environmentally conscious data centers. Although work had been done on the formulation of guidelines to encourage data center energy efficiency through forums and other initiatives by industry bodies such as The Green Grid (TGG), a US-led international agency, no international standards existed.

Overview of Hitachi data center

Overview of standardization for next-generation smart cities

As Ichikawa explains, "Data centers include both utilities and the computing equipment they support, and rather than seeking to reduce their energy use independently it is more effective to try to improve the energy efficiency of the overall system. For example, it is easier to save energy by concentrating the workload in a particular location that can be cooled efficiently and independently of the rest of the data center. A data center that is able to coordinate the operation of utilities and computing equipment in this way is called a 'smart data center' and work is in progress on formulating standards for data center optimization. Such a standard is likely to expand the business opportunities for companies or consortiums that possess both utilities and computing technology."

Currently, standardization for smart data centers is being discussed at Ecma International under the auspices of the three main standards bodies referred to earlier. The intention is to publish a standard by the end of the year. A joint working group is also being set up with TGG.

"Data center energy efficiency has become a pressing issue," says Ichikawa, "with the current electricity shortage in Japan feeding concerns about their huge energy consumption as well as the importance of reliability. Work on formulating standards for environmentally conscious data centers has got underway at various agencies including the ITU-T and Joint Technical Committee 1 (JTC 1) of the ISO and IEC, and regulations for data centers, servers, and other similar equipment are starting to appear including a code of conduct issued by the European Union (EU) and through the USA's international Energy Star program. We certainly hope that our own standards will be adopted in these initiatives."

Japan Takes Initiative in Standardization of Next-generation Cities

Another grand initiative coming out of Hitachi is the proposal of international standards for next-generation smart cities. The approach whereby an entire city including its infrastructure is designed to coexist with the environment has gained momentum in recent years in emerging cities such as the Tianjin Eco-city in China. This has seen the emergence of the business of selling entire cities as a complete package. For countries like Japan with its high level of technical capabilities in fields like transport, water, energy, and waste processing, this can be seen as a significant opportunity for its businesses to expand into emerging nations and for technology transfer.

As Ichikawa notes, "Japan is not necessarily able to demonstrate strong price-competitiveness in individual technologies, but the excellence of its technology when viewed as a total package places it in a good position when it comes to cities which are at the top end in terms of project scale. That is why we want to establish the smart city concept and its evaluation criteria at the ISO.

"Given estimates that 70% of the world's population will be urban by 2050, it is essential that we succeed at the difficult task of reducing city carbon emissions while at the same time improving the quality of life of city residents. Achieving this will require more intelligent infrastructure, including smart grids (next-generation electricity distribution networks); energy management systems for districts, buildings, and households; next-generation transport services that operate smoothly with low carbon emissions; and water systems that make effective use of water resources. Japan and some other countries have

WBCSD panel discussion

technical capabilities in these fields and I believe we can succeed at both goals."

There is also much to be gained from establishing evaluation criteria for smart cities. This is because it allows quantitative self-assessment of the benefits or otherwise of the investment of tax money or benchmarking and ranking against other cities to attract tourists as well as companies, universities, and other organizations, for example.

"Currently," says Ichikawa, "Hitachi is taking a leading role in preliminary studies and has invited participation by other players including the Ministry of Land, Infrastructure, Transport and Tourism, the New Energy and Industrial Technology Development Organization (NEDO), electrical machinery and home appliance makers, and trading companies. In the future, our aim is to build an all-Japan framework that also includes the likes of construction companies and designers. If such a grouping can be put in place, it has the potential in the future to become a huge special-purpose committee with participation by many people from all around the world.

"I got a big response when I spoke about smart cities recently at the World Business Council for Sustainable Development (WBCSD), with people from different countries expressing an interest in participating. It is a huge and challenging issue and it would be an epoch-making outcome if it were to come about. I hope it can also help with the rebuilding of towns after the Great East Japan Earthquake."

Which International Environmental Standards will be in Spotlight Next?

Ichikawa sees biodiversity as an area of environmental standardization that will become important in future. This is because, of the three pillars of environmental activity, (1) climate change, (2) resource recycling, and (3) biodiversity, it is on the last that action has been most delayed.

"While all sorts of activities are getting underway such as ecological offsets which construct ecosystems in different locations to compensate for the impact that human activity has on the ecosystem, measures for encouraging sustainable use of the benefits provided by nature, and Japan's Satoyama Initiative, regulation of these activities continues to be based only on local rules. That is, this is another area in need of more standardization. At the WBCSD, where Hitachi, Ltd. President Hiroaki Nakanishi is the co-chair of the core team dealing with ecosystem preservation, a variety of different methodologies are under development."

There is considerable activity in this field with initiatives such as Corporate Ecosystems Valuation (CEV), a quantitative methodology for valuing ecosystem preservation.

Meanwhile, there is a risk that international standards relating to greenhouse gases could be a major drag on business activity. Currently, work is in progress on issuing international standards relating to greenhouse gas reporting on total emissions over the life cycle of a product (its "carbon footprint"), including emissions that occur in the supply chain.

"While this is not particularly difficult for products like foods or cosmetics that do not themselves consume any energy," says Ichikawa, "it becomes extremely problematic when applied to the electrical and electronics sector. For example, the energy consumed by a refrigerator in use is greater than that consumed in its production and we are entering an era in which producers need to include such consumption in their estimation and reporting of emission volumes. We feel there is a need to devise a scheme suitable for the electrical and electronics sector and this is being discussed at the IEC Technical Committee 111 for Environmental Standardization for Electrical and Electronic Products and Systems which I chair. As a result, a decision to set up a working group was made in February of this year in response to a Japanese proposal."

International standards can sometimes provide a major boost to business; at other times be a serious impediment. However, if the human race collectively is to enjoy and exploit the benefits of nature and maintain economic activity, environment-related international standards will likely play an increasingly important role in future. We also look forward to a larger contribution from Japan with its unique and excellent environmental technology.