

Information technology meets energy efficiency: a fruitful combination

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Abstract

The paper describes the authors' experience designing and implementing web sites, information and communication (ICT) systems, and collaborative project web sites regionally within Asia and within capacity-building projects in energy efficiency in both Thailand and Malaysia. We make a crucial distinction between information and knowledge -- information being the data in the form of documents, facts and figures, while knowledge is information when it is turned into a useful context and understood by the parties who have a need for the information.

Regionally within Asia, we have participated in development of two leading web sites in the area of energy-efficiency standards (www.clasponline.org and www.apec-esis.org), and we discuss the process of establishing and attempting making these information resources sustainable. Within Thailand and Malaysia, we are involved in long-term capacity-building projects within national energy-efficiency organizations. We describe our experiences establishing internal project web sites for collaboration among staff and consultants; as well as external web sites and knowledge management systems that assist the partners to communicate, share information with, and promote their programs to their respective target audiences.

Introduction

The paper describes our experience designing and implementing web sites, information and communication (ICT) systems, and collaborative project web sites within the Asia-Pacific region as well as within capacity-building projects for energy efficiency (EE) in both Thailand and Malaysia. We describe a work in progress and share our lessons learned to date, as well as our ideas about areas for further improvements.

Approach to ICT and Knowledge Management

We make a crucial distinction between information and knowledge -- information being the data in the form of documents, facts and figures, while knowledge is information when it is turned into a useful context and understood by the parties who have a need for the information. In our initial work on energy-related web sites and databases, our goal has been to provide information in a widely accessible format (the Internet) while also attempting to make it available in a dynamic and context-dependent fashion.

The definition below stresses the fact that knowledge is not what resides in databases, but rather what makes the information "actionable" or useful to the end user.

Knowledge is the key resource in intelligent decision-making, forecasting, design, planning, diagnosis, analysis, evaluation, and intuitive judgment making. It is formed in and shared between individual and collective minds. It does not grow out of databases, but evolves with experience, successes, failures, and learning over time. (Tiwana 2000: 57)

Our approach to ICT and knowledge management has been to experiment, try out new tools, and gradually incor-

porate these into our work as energy consultants working in the area of energy efficiency in renewable energy. The energy consultancy market is at present still conservative and “engineering-minded”. Considering that we are dealing with such a soft areas as “learning” in the broad sense, and considering that energy consultancy is a multi-billion-dollar market, it is rather astonishing that there is so little actual “learning” and effective knowledge management built into typical practice (VNU Business Media).

Clearly, bulky reports are not an up-to-date “tool” to support knowledge transfer, or support social and knowledgeable community-building. (How often have we heard the joke about using the report either as a “door stop” or to collect dust on a bookshelf?) The critical question is, how can we better support relevant learning and community-building for our clients? And how can we make tacit and not only explicit knowledge available to beneficiaries?

Clearinghouses in Standards and Labeling

CLASP WEB SITE

The CLASP web site (www.clasponline.org) was set up by the Collaborative Labeling and Appliance Standards Program (CLASP) when one of the authors (du Pont) was Asia Director for the International Institute for Energy Conservation. The web site serves as a clearinghouse for information on energy standards and labeling, and is regularly updated with information on reports, workshop proceedings, and upcoming events. It also has a database of standards and labeling initiatives in countries around the world.

One of the strengths of the CLASP site is its dynamic structure. Each page (whether a text page, a report in the library, or a workshop announcement) is a record in the database, and the web pages are thus not static and pre-set, but can be called up on demand based on a search by the user.

One of the drawbacks of this multi-functional web site is that it is difficult to view and compare data across a country or across a product type (e.g., refrigerators). This drawback was corrected in a database/web site designed specifically to serve as a reference site for energy standards in the Asia-Pacific region (see below).

APEC ENERGY STANDARDS INFORMATION SYSTEM

At the APEC¹ Energy Ministers in Edmonton in August 1997, the ministers directed that economies introducing or preparing mandatory energy efficiency requirements advise other economies. The Energy Ministers further endorsed the Standards Notification Procedure in their Okinawa meeting in October 1998 and the General Policy Framework for Cooperation on Energy Standards in their San Diego meeting in May 2000. The APEC Energy Standards Information System, or APEC-ESIS, is the culmination of this process, and it focused on establishing a web-based database for tracking, maintaining, and updating information on energy standards for end-use equipment in the 21 APEC economies.

APEC ESIS has two primary objectives:

1. Establish a system for systematically and simply tracking and updating information on energy-efficiency performance standards that are either in use or under development.
2. Identify long-term alternatives for the coordination in energy standards development among APEC economies.

APEC-ESIS was established with APEC support by an international project team from New Zealand and Thailand², in collaboration with the Collaborative Labeling and Appliance Standards Program (CLASP). The ESIS database and web site is more focused than the CLASP web site. While the CLASP web site has information about programs, initiatives, and workshops related to standards and labeling, APEC-ESIS is dedicated solely to providing specific and detailed information about the technical standards for energy performance testing, energy labeling, and minimum energy performance standards in country. The ESIS database is actually a set of related databases that tracks information on programs, regulations, technical qualifying levels, and contact persons. The primary building block of the database is the individual standard or regulation (i.e. testing standard, minimum energy performance standard -- MEPS, or labeling requirement) applying to a particular equipment type in a particular country.

The database is programmed in the Microsoft Access program, a widely accepted international standard for databases. The Consultant's overriding concern in developing the database was ease of use by the “consumer” – presumed to be an energy or standard official, consultant, academic, manufacturer or distributor, or consumer associations or NGOs.

One of the most important design features of APEC-ESIS is flexibility and ease of use for the viewer. The database

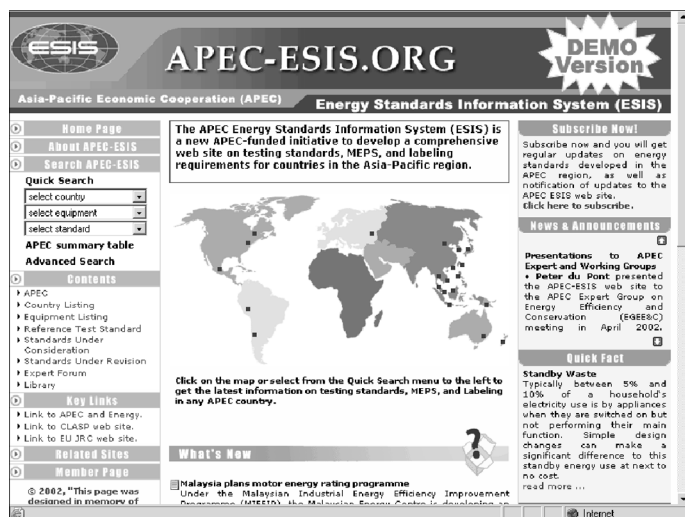


Figure 1. Home page of the APEC-ESIS web site.

1. APEC is the Asia Pacific Economic Co-operation forum, an intergovernmental body that promotes cooperation primarily on economic- and trade-related issues.

2. David Cogan of New Zealand's Energy Efficiency and Conservation Authority (EECA); Frank Pool, New Zealand consultant; and Sommai Phon-Amnuaisuk of the International Institute for Energy Conservation (IIEC), Bangkok.

“views” allow the web site user to view the data in a number of different configurations. For example, standards for a type of equipment can be viewed across all the APEC economies. Each line shows the testing standards, MEPS, and labeling requirement for air conditioners in a certain economy. It is thought that this will be a very useful feature for both manufacturers and policymakers, who currently have no easy way to collect and compare this information.

At the same time, there will be many cases where the user wants to focus on the standards for equipment within a single economy. The web site allows a user to view standards for all equipment sold within an economy to be viewed in a single table. Again, after viewing the summary information on each line, the user can double click on a particular standard (i.e. a testing standard, MEPS, or labeling requirement) to get more detail about the standard.

FUTURE INITIATIVES IN THIS AREA

Initial response to the APEC-ESIS web site has been quite positive, and the authors -- in collaboration with colleagues in New Zealand, Chinese Taipei, as well as from CLASP -- are working to expand ESIS in order to cover equipment and appliances in more countries. We have reached agreement with CLASP to link our web sites in a number of areas, including the documents database, upcoming events, and database of standards and labeling. The eventual goal would be an integrated portal for global information on standards and labeling.

One proposed initiative for expanding ESIS is include countries in South Asia. Such a tool would be useful and could be a useful input to the South Asia Regional Initiative – Energy, which is funded by the U.S. Agency for International Development.

We have also been exploring the option of expanding ESIS to include countries in Europe and elsewhere, and to that end have been pursuing incorporation of ESIS as part of a new task on Energy Standards Coordination under the International Energy Agency’s DSM Implementing Agreement.

Using the Web in Thailand

We have also been using web-based tools in our work in Thailand, where we are implementing a DANIDA-funded project to assist the Thailand Department of Alternative Energy Efficiency and Development (DEDE) to design and implement two new simplified schemes for providing financial incentives – a 30% Subsidy Program, and an Energy Efficiency Revolving Fund.

First, we developed a publicly accessible web site where all information related to the program is kept up to date. The response to the web site has been dramatic, especially within a very bureaucratic culture, where there are many institutional constraints to the flow of information throughout the agency. The program managers find that the program web site serves as a one-stop shop and greatly facilitates their marketing and outreach efforts, since all of the updated information can be found in one place – including the program applications. In the past, the program marketing was very paper-intensive and required regular updating of brochures and information packets, and the single program web



Figure 2. A page on the DEDP New Programs web site. Information for the technology-subsidy program can be gathered by clicking on a picture of the relevant equipment type.

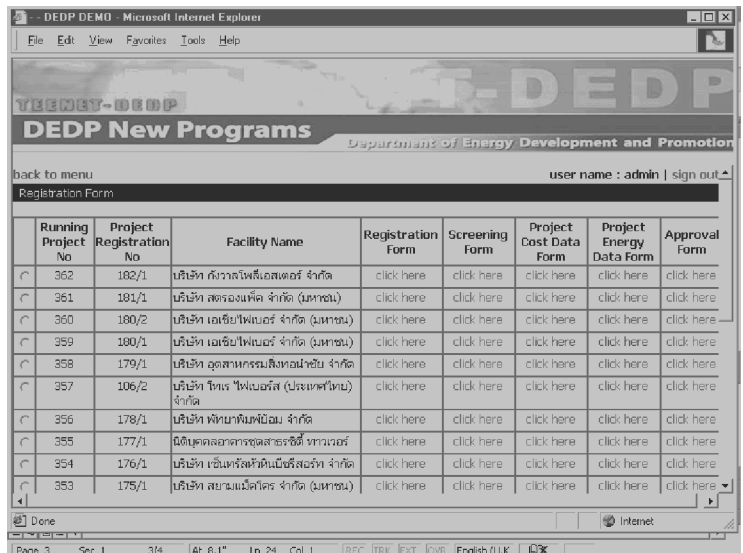


Figure 3. A page on the DEDE's Tracking Database for the 30% Subsidy Program. DEDE officials can click on a facility to get information about basic contact information, project cost data, project energy savings data, or approval status. Other pre-programmed report menus enable DEDE managers to print out summary reports to get real-time information about overall program status, including number of applications, number of facilities, total subsidy requested and approved, total amount invested by the private sector, energy savings, etc.

site has reduced the need for constant updating of such paper packets.

Even more useful than the web site has been the Program Tracking Database, which was developed to assist program staff in the monitoring and evaluation of their program results. The database was initially envisaged as a method for providing overall summary results for the project (e.g., number of facilities, energy savings, amount invested, etc. During development and programming, however, it became apparent that the database could serve a more fundamental role in day-to-day program operations. After an approximately two-month development period, the

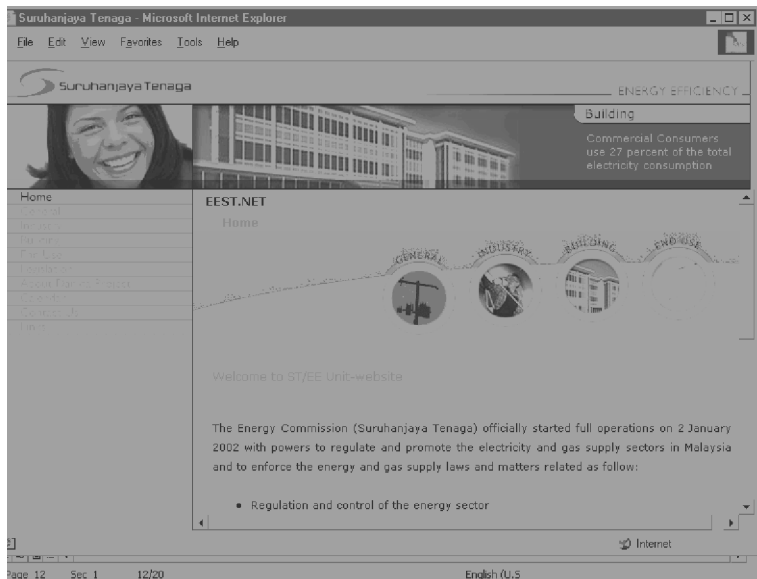


Figure 4. Home page on the Malaysian Energy Efficiency Knowledge Portal. The main categories can be seen – general, industrial, buildings, and end use. Regular users are invited to participate in special areas called Quick Places, where discussions and exchanges are hosted in a password-protected area.

tracking database was completed and yielded immediate benefits by allowing the agency to report on the results of the program to top management. The database allows DEDE staff and collaborators to enter and review data on the program and to print out summary reports of program status. In the past, these summary reports would be prepared on a monthly or bimonthly basis. Now DEDE managers can get up-to-the minute results, since all project applications are updated each time there is a significant activity (i.e. approving a subsidy, installing or inspecting an energy-efficiency measure, inspecting the site after installation, etc.).

Using the Web in Malaysia

BACKGROUND

As a part of a DANIDA-funded capacity building project in Malaysia on Energy Efficiency and Demand Side Management, our company has taken the initiative to strengthen the information and knowledge sharing among various stakeholders and interest groups to enable them to manage and coordinate the development and implementation of various energy efficiency activities. The knowledge sharing system is organized and managed by the Malaysian Energy Commission, which is the home of the DSM Unit.

A key point for the development of the system was acknowledgement of the fact that the knowledge-sharing system should comprise two main parts: 1) data and 2) the utilization of the data. Without the latter, the information just piles up on the shelves. A way to utilize information is to facilitate access to the information whenever needed.

INVOLVED PARTIES

During 2002, a large group of key Malaysian stakeholders were identified and invited to participate in the design and

implementation of EE activities in the country. The new approach to preparing EE plans and projects was envisaged to be based on a bottom up approach where energy end users and stakeholder organizations should take an active part in formulating activities and strategize their implementation. For this purpose two stakeholder seminars were held where a total of 150 key stakeholders participated. They organized themselves into groups looking into EE activities on different levels.

Two advisory boards were established to oversee and coordinate activities within industrial and residential sectors respectively. These boards have representatives from main associations and organizations representing the majority of the end users in their sectors. These two boards each appointed an energy rating group that was tasked to look into energy rating and labeling schemes for household appliances and industrial equipment, respectively. These energy rating groups have been making recommendations on a coordinated, overall rating scheme and campaign for Malaysia. Under the energy rating working groups, sub work groups were created to look into design of specific programs for rating and labeling of motors and refrigerators.

PHYSICAL MEETINGS

There are currently six groups (Advisory Boards, Working Groups, Sub-Working Groups) in place. These groups have regular meetings with discussions and presentations. The intention of the meetings is to facilitate a forum for decision making and hence proper information and understanding of the issues discussed on the meetings is crucial for the momentum of the decision making process. Hence pre-briefings and discussions will enhance the level of discussions and lead to focused and streamlined procedures on the meetings, leading to a streamlined process towards final conclusions and implementation.

VIRTUAL MEETINGS

To facilitate both pre- and post-meeting discussions and knowledge sharing, knowledge portals has been developed for team networking over the Internet. All members of the established groups automatically become members of their respective knowledge portal, where they can enter a virtual discussion room, library, group calendar, task lists, etc. Today a total of 150 people are members of these knowledge portals.

The knowledge portals are equipped with different “rooms” for the different groups working on specific issues. For example a group working with developing rating and labels for appliances can design its own “room”.

Lessons Learned to Date

On a most basic level, these efforts have succeeded in improving the speed and productivity with which information is disseminated and shared. For example, the CLASP web site has one of the most extensive international libraries with documents on energy standards and labeling; and the ESIS web site will soon become the international reference for technical levels on energy standards in different countries.

On a more specific, programmatic level, the Thai and Malaysian efforts have provided parallel experience in using the Internet and web-based tools to build capacity and support program implementation. In Thailand, the DEDP New Programs web site has set a standard for program implementation, since it provides a clear and easy way for the implementing agency to disseminate program materials, including application forms, technical background documents, and it is easy to update. But the Program Tracking Database has been particularly useful, since it for the first time provides both the implementers and program managers with real-time data on the status, progress, and results of the program implementation.

The Malaysian knowledge portal is perhaps a more ambitious attempt to provide an integrated framework for sharing information and facilitating interaction among program stakeholders. The knowledge portal mirrors the structure established for program outreach with stakeholders, and it is envisioned that the “virtual meetings” on the knowledge portal will support and supplement the physical meetings that take place between stakeholders and the program implementer on a regular but infrequent basis.

The examples described here are just the beginning of our efforts to integrate ICT and knowledge management into our ongoing work on capacity-building in energy efficiency. There have been a number of hiccups and false starts. For example, it will take more time, effort, and experience before the Thai agency assumes ownership and direct control of its New Programs Database. And it is not yet clear whether they will adapt the Program Tracking Database for other their implementation programs. In Malaysia, the usability of the Knowledge Portal has been hampered somewhat because of the time schedule for backing up the server in Denmark. But such barriers are to be expected and in any event must be hurdled in any effort to try to create workable systems for sharing and spreading knowledge and best practices throughout any organization, be it public- or private sector.

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