

BATF-06-24 ~ 25 —Building Codes

Project number: BATF-06-24 ~ 25		Date: 31 August 2006
Title of project: Role enhancement of Building Energy Codes		
Leading member & co-leading member: Lead: Korea; Co-Leads: U.S		
Participants: China, Japan, United States, Australia, India		
Project Overseer: Mr. Seung-Eon Lee, PhD, Building & Urban Research Department, Korea Institute of Construction Technology		
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Financial information	Total cost of proposal: US\$5.1 million	
Type of project: <input type="checkbox"/> Demonstration/pilot <input checked="" type="checkbox"/> national policy, law, regulation <input type="checkbox"/> appliance testing/labeling <input checked="" type="checkbox"/> Seminar/symposium <input type="checkbox"/> training & technical assistance <input type="checkbox"/> public/consumer information <input type="checkbox"/> Database/website <input checked="" type="checkbox"/> survey, analysis, research <input type="checkbox"/> others (<i>Please specify</i>)		
Project start date: 1 Nov 2006		Project end date: 31 Oct 2011
Project summary: Building codes for energy conservation is the most basic and powerful measure of each country as the essence of each country's available technologies and policies. A good and successful code could be used for a reference that allows other countries to reduce an investment of time and money for developing and improving their own code. This project includes exchanging each Partner's code information, policy systems, evaluation and rating systems, and lessons learned acquired through implementation. This project covers technical matters as well as governance system of building code. Finally, this project should contribute to enhance international trades of building materials and systems also international cooperation of building related companies to develop new markets.		
Signature of Project Overseer: Seung-Eon Lee Date: 25 August 2006		
Signature of Task Force Chair: Hakdo Kim Date: 31 August 2006		
Remark:		

Goals and Objectives

The goal of this project is to enhance mutual understanding of each country's building energy code, with the ultimate objective to increase international trade among building industries as well as developing and improving each member country's own code.

As a result of this project:

- 1) The Partner countries with well-organized codes have a chance to share their valuable experience with other Partner countries who are still seeking more advanced building energy codes and governance systems.

- 2) The Partner countries undergoing the development of more acceptable and stringent codes will reduce the time and expenditure for improving codes by using the experience and technical system of other Partner countries with well-organized building codes.
- 3) By mutual understanding of other Partner countries' codes and finding the common principles of code systems, an agreed vision for future work of harmonized standards will be established.
- 4) Harmonizing of underlining technical evaluation and rating provisions will foster the development of consistent codes that are robust and that have high levels of compliance from the manufacturer supplier and building construction industries.

Performance Indicators

- 1) Publishing "The Comparison of Building Energy Code between APP Countries"
- 2) Publishing "The Future Role of Building Energy Code for National Energy Conservation"
- 3) Publishing (1+2) "A strategic vision for international cooperation on building energy codes"
- 4) Visibility and detailed plans to implement or improve window labeling and certification programs leading to more robust and compliant building codes

The building codes as outlined in this project respond to the priorities set by the PIC by allowing for collaboration to "create an enabling environment for the development, diffusion, deployment and transfer of existing and new practices" in the form of the building codes, as described by the Vision Statement. In addition, by evaluating the appropriateness of an existing test procedure, this project follows section 3.1 of the Action Plan Guidelines that expects each Task Force to "build on a wide range of actions already in place in partner countries" and to "leverage existing initiatives to maximize return on resources." Lastly, this project responds to the Work Plan objectives by using "cooperative mechanisms to support further uptake of increasingly more energy-efficient appliances" and attempting to "identify and respond to a potentially significant barrier that would limit the implementation of end-use energy efficiency practices and technologies." The Partners will demonstrate technologies, enhance and exchange information relating to energy efficiency codes, share experiences and policies on best practices with regard to standards and codes, as well as labeling schemes for buildings, building materials and appliances.

Background

Most Partner countries have their own building codes, standards, and labeling (mandatory and/or voluntary) schemes for building energy conservation. And building code for energy conservation is the most basic and powerful measure of the essence of each Partner country's available technologies and policies.

In the majority of cases, these building codes and performance levels required are different according to the circumstances of each Partner, resulting in trade barriers for companies to make inroads into the foreign markets.

A good and successful code could be used for a reference that allows other Partner countries to reduce their investment of time and money for developing and improving their own code.

This project includes exchanging each Partner country's code information, policy systems, evaluation and rating systems and lessons learned. It could also cover technical matters as well as governance systems of building codes.

Finally, this project should contribute to enhance international trade of building materials and systems also international cooperation of building companies to develop new markets in Partnership regions.

In addition, for Partner countries looking to develop or improve their codes and standards or labeling program, this project will reduce the burden of code making, which needs intensive endeavors in terms of cost, time, and technical expertise to do properly. They could refer to codes developed by another Partner and evaluate them to determine which is appropriate for their country's circumstances and market situation.

This project will specifically address a critical area within the building code and building construction arena. Windows are the weakest, or most energy-intensive, component of the building thermal envelope. As a result there is an enormous opportunity for cost-effective energy and carbon reduction with the introduction of new technologies. For example, the development and significant penetration of Low E windows (residential > 50% and commercial > 25%) in the U.S. economy has resulted in over US\$30 billion in energy savings. With this mature market, the manufacturing cost of Low E glass has dropped to about US\$0.50 to US\$0.25 per square foot.

To achieve this significant penetration, an effective window rating, labeling and certification program has been critical and has resulted in code adoption for more efficient window products in both heating- and cooling-dominated climates.

By establishing and improving window labeling and certification programs cohesively among Partner countries, the process of developing improved window ratings can be accomplished more efficiently and with reduced cost for all Partner countries. The effective implementation of more stringent window codes in all Partner countries will lead to greater manufacturer investment in each country, promoting higher valued jobs, and will result in positive net benefits to consumers and national economies.

Methodology

For the comparison of building energy code between Partner countries:

- Gather information on existing codes or efforts to develop building energy codes, as well as any mandatory and voluntary programs already underway executed by government.
- Establish working group and prepare survey sheet.
- Gathering Partner report in given survey sheet which include the scope, target buildings, performance level required, implementation method (mandatory or voluntary and prescriptive or performance based etc.) of building energy codes and general circumstances of each country (statistics related to building sector; existing building stocks, the amount of new building construction, population etc.).

- Evaluate structures and level of existing codes of Partner countries.
- Submit a full version of code (related building energy) in English for mutual understanding of other Partner's codes.
- Compare required level of basic and main items(insulation level, air tightness, efficiency of building systems etc.).
- If there is a need of new part or items for building energy codes, or existing codes are inadequate or should be improved, work with code experts to draft a new code contents via face-to-face meetings, conference calls, and e-mail in working groups.
- Establish spreadsheet-based methodology to assess resulting benefits of building code execution which include:
 - National energy consumption reduction by code execution.
 - Estimated reduction of GHGs by building energy code strengthening.
- Circulate a report “Building codes of APP countries” to Partner countries to review and amend it.
- Use data collected to develop various performance levels for use by policy makers.

For enhancing role of building energy code for national energy conservation:

- To enhance future role of building energy code, share experiences, find the new methodologies and gather idea of middle & long term plans for member countries, finally this work will contribute to the reduction of national energy consumption as well as developing new technology and extending market capacity.
- Analyze the relationship between the code enforcement and national energy consumption on long-term basis.
- Find the new role of codes to enhance building environment performance, leading capacity of technology development and market extension etc.
- Circulate a report “The Role of Building Energy Code for National Energy Conservation” to Partner countries to review and amend it.

For establishing or improving Window Labeling and Certification Programs

- Market information and analysis (Stage 1)
- Determination of standard and procedures for rating (stage 2)
- Implementation of the domestic rating procedure (stage 3)
- Recognition of cross-certification and labels (stage 4)

Project 1: The comparison of building energy codes between Partner countries

- Collect each Partner's report written in given survey sheet on the general status of building energy code including scope, target building (usage, scale etc.)
- Submit a full version of code in English for improving mutual understanding between Partner countries.
- Report on current national codes and programs of each Partner.
- Report on code structure and main contents.
- Report on implementation system (mandatory or recommendation).
- Report on national circumstances regarding building energy consumption (weather, population, GDP, energy intensity, amount of building stock and new building and etc.).

Project 2: The future role of building energy code for national energy conservation

- Report on building energy consumption of each Partner.
- Report long-term estimation of energy consumption in building sector.
- Report possible scenarios to reduce energy consumption and GHGs by toughening or role enhancement of codes.
- Draft a report.
- Circulate to Partner countries for comments and to finalize.

Project 3: For establishing or improving window labeling and certification programs

- Market information and analysis (Stage 1)
 - Hold workshop establishing status of energy-efficient window potential and needs of the industry with tangible next steps to help grow the industry.
 - Gather information and analyze rating standards and operation documents (program documents) including available software tools for analyzing and calculating fenestration ratings.
 - Market survey of types of buildings, construction practice and fenestration systems
 - Survey and determination of market key players and survey the national and state level building codes with the other tasks of this project.
 - Gather information about the national and local infrastructure, such as testing facilities and equipment available for testing and, simulation laboratories.
- Determination of standard and procedures for rating (Stage 2).
 - Workshop/Conference discuss the findings and analysis of the stage 1.

- Updating Simulation tools and databases to include all participating Partner countries.
- Creating documentation for the use of simulation tools (simulation manuals) and testing laboratory equipment requirements, operations, quality control and designs.
- Developing a quality control program and program documents.
- Research co-ordination to develop the next generation windows and rating procedures.
- Implementation of the domestic rating procedure (Stage 3)
- Training, organizational development, etc.
- Recognition of cross-certification and labels (Stage 4)
- Procedure and/or label harmonization, improved window trade, code implementation, manufacturer investment in value added window production in domestic countries.

Dissemination of Project Results

Majority of interaction and dissemination will occur via email. A dedicated Partnership website may be established to facilitate posting of documents and comment on draft documents. Target audience is technical consultants, testing laboratories, government agencies, and other in Partner and (perhaps) other interested countries.

Assessment of Project

Project results include the essential information of Partner's codes and future effect of energy code by enhancing its role. Possible energy consumption and GHGs reduction rate will be presented by code's role reasonably strengthened.

Participation and Management

Management

Leader: Mr. Seung-Eon Lee, Korea Institute of Construction Technology

Participation

Japan: Ms. Akiko Ito of Ministry of Land, Infrastructure and Transport; Mr. Hirokazu Ikezawa of Nikken Sekkei; Kiyoshi Sawaki of Agency for National Resources and Energy

Australia: Mr. Michael Green , Tony Marker of DEH

United States: Mr. Jean Boulin (*POC), Mr. Richard Karney and Mr. Marc LaFrance of U.S. DOE/Building Technologies; Ms. Jean Lupinacci of U.S. EPA/Energy Star; Mr. Joe Huang of LBNL; Mr. Ken Mentzer of NAIMA (Insulation Mfrs. Assoc.); Mr. Bipin Shaw, NFRC

China: TBD

India: TBD(will want to join for window)

Estimated Budget and Funding Sources

TBD

Sub-Project/Task	2007 Funding (US\$'000)	2008 Funding (US\$'000)	2009 Funding (US\$'000)	2010 Funding (US\$'000)	2011 Funding (US\$'000)	Total (US\$'000)
1. The Comparison of Building Energy Code between Partner countries	600	600	200	200	200	1,800
2. The Future Role of Building Energy Code for National Energy Conservation			500	500	500	1,500
3. Establishing or improving Window Labeling and Certification Programs	300	300	400	400	400	1,800
Project total	900	900	1,100	1,100	1,100	5,100