

PROJECT REGISTRATION FORM

Project Number: BATF-09-56	Task Force: Buildings and Appliances
Title of Project: Promotion of Cool Roofs and Development of Cool Roof Energy Performance Labeling and Certification	
Lead Partner Country: USA	
Participating Partner Countries and Organizations: Australia: Department of the Environment Heritage and the Arts, Roofing Tile Association of Australia. India: Ministry of New and Renewable Energy, Bureau Of Energy Efficiency (BEE), Glazing Council of India (GCI), Indian Institute of Information and Technology (IIIT) Hyderabad. Japan: Ministry of Economy, Trade and Industry (METI) United States: Cool Roof Rating Council (CRRC), US-Department of Energy (DOE), WinBuild, Inc., and US DOE National Laboratories	

Project Location (Country, State/Province, City): **India, China, Australia and Japan**

Project Manager Information

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Project Start Date: 1st May 2010

Proposed Project End Date: 30 April 2012

Description of Project:

Building certification programs for new and existing buildings can significantly impact the building energy consumption on a long term basis. Proper implementation of the certification program along with requirements in building codes can drive the market to develop and use more energy efficient products, and thus reduce energy consumption and greenhouse gas emissions. Development of Cool Roof rating in APP countries will help achieve the goal of energy savings and green gas reduction.

Cool roofs are a classical energy efficiency measure where a cool roof is installed on a building to reduce solar heat gain. Reducing solar heat gain will reduce interior temperatures, reduce air conditioning loads, and reduce electricity use. The second area involves the collective effect of densely populated highly absorbing surfaces (i.e. dark roofs, roads, and parking lots) that result in increased urban temperatures referred to as Urban Heat Islands. Unconditioned buildings where there will not be any energy savings but there will be improved interior comfort can be included in this category. Finally, reflective roofs and pavements directly reflect part of the incoming solar radiation back to space and hence should contribute to cooling the globe.

The most straight forward definition for a cool roof or surface is one that reflects the sun's energy. This is measured by solar reflectance (SR). The higher the SR, the more of the sun's energy is reflected rather than absorbed. SR takes into account the energy component of visible light and near infrared (solar radiation). White roofs do a good job of reflecting both visible light and near infrared for a high SR. Other colored roofs may have near infrared reflective pigments that improve SR, but they are not as effective as a white roof because they don't reflect the energy in the visible light. Another key characteristic is thermal emittance (TE). While not as significant as SR, high TE allows any absorbed heat on a surface to be radiated away more quickly. This helps it not retain the heat in the surface. Thus, a cool roof should have both high "solar reflectance," (ability to reflect sunlight, measured on a scale of 0 to 1) and high "thermal emittance" (ability to emit thermal radiation, also measured on a scale of 0 to 1). These are called the surfaces "radiative" properties

Large populations and huge building stocks in India and China, along with the boom in real estate are imposing high power and energy requirements. To overcome the demand, we need to design energy efficient buildings and promote the selection and use of energy efficient building materials.

To reduce energy use and emissions in this sector, it is critical to demonstrate—and build capacity for implementing—efficient building technologies and practices. Key measures include: 1) building energy efficiency measures into the design phase of new construction through demonstration and training; and 2) reducing energy use in existing buildings through building retrofits and effective low or no-cost

operations and maintenance measures, including using more efficient building materials.

The project will develop a Cool Roof component certification program to be the nationally accepted benchmark for the design of new and retrofit, construction and operation of high performance energy efficient buildings. The certification program will provide products energy performance levels which will enable building inspectors a means to verify compliance of the Code.

As part of the implementation program of the codes, the agencies responsible for implementation of codes are interested in developing an institutional capacity which will be able to administer and provide accurate independent certifications of the roof component performance parameters. The establishment shall also help establish an energy performance testing laboratories to provide certification services.

The project will have the following goals:

- Establish harmonized standards to establish product performance for rating and labeling of Cool Roof Products.
- Develop accelerated age testing procedure and standard for cool roof products.
- Develop a web based cool roof simulation tool to provide consumers a quick way to determine the energy savings and cost benefits.
- Develop cool roof component rating program. Cool roof helps reduce the energy loads in a building which needs to be handled by air conditioning.
- Develop cool roof certified component listing database and be made available to public
- Promote use of cool roof certified component, labeling system and its implementation by pilot demonstration and monitoring, organizing conference and workshops involving key stake holders.
- Help build infrastructure for cool roof testing, simulation and quality check capacity to support ratings and verification.

Train code officials and professionals to administer and implement the rating and certification programs.

Project Objectives: Promotion of Cool Roofs and Development of Cool Roof Energy Performance Labeling and Certification leading to code adoption and program elements for building retrofits.

Project Deliverables:

Cool Roof component energy labeling system:

- Through workshops, seminar and trade show participation introduce information and experiences on the implementation of cool roof rating systems such as in the USA.
- Conduct pilot projects to demonstrate cool roof energy efficiency benefits.
- Organize workshop to establish harmonized standards and practices to establish product performance for rating and labeling of Cool Roof Products.
- Organize workshop to develop accelerated age testing procedure and standard for cool roof products.
- Develop promotion of cool roofs, fact sheets, case study, etc. for consumer awareness.
- Web based cool roof simulation tool (cool roof calculator) to provide consumers a quick way to determine the energy savings and cost benefits.
- Establish cool roof component rating program in at least one of the APP interested countries.
- Establish cool roof certified component listing database and be made available to public
- Host workshops and conference in India, China and Australia, involving key stake holders, to promote use of cool roof certified component, labeling system and its implementation.
- Establish infrastructure in at least one of the APP interested countries for cool roof testing, simulation and quality check capacity to support ratings and verification.
- Transfer engineering expertise to assist with the construction and operation of the simulating and testing laboratories. These facilities are a fundamental quality assurance requirement in the fenestration rating procedure ensuring accurate fenestration energy simulations are provided to consumers and building officials.
- Host workshop to train code officials and professionals to administer and implement the rating and certification programs.

Project Milestones:

Indicators:

- 1) Conference in at least one APP country Fall 2010
- 2) Workshop of Key Standards developing agencies and experts Fall 2010
- 3) Setting up of a testing laboratory and required infrastructure in at least one APP country. Spring 2012
- 4) Initiate Pilot Project in one APP country Fall/Winter 2010
- 5) Cool Roof Rating program establishment by Spring 2012
- 6) Membership Drive to create an inclusive body in the APP country by December 2010
- 7) Number of Technologies and Methodologies Developed or Tested for Broad Dissemination.

Potential technologies:

- Surface Reflectance measurement
- Surface Emittance measurement
- Accelerated Age testing
- Thermo physical Property Material testing

Resources:

Total Project cost:

USA - \$ 1,000,000

India - \$200,000

Australia - TBD

Japan – TBD

Proposed Project End Date:

Project Already Complete: Yes No

Other Information: Move to IPEEC, SBN

This project was endorsed newly in the end of 2009.