BEEP
BUILDING ENERGY
EFFICIENCY PROJECT

Indo-Swiss Building Energy Efficiency Project (BEEP)

Ministry of
POWER
GOVERNMENT OF INDIA

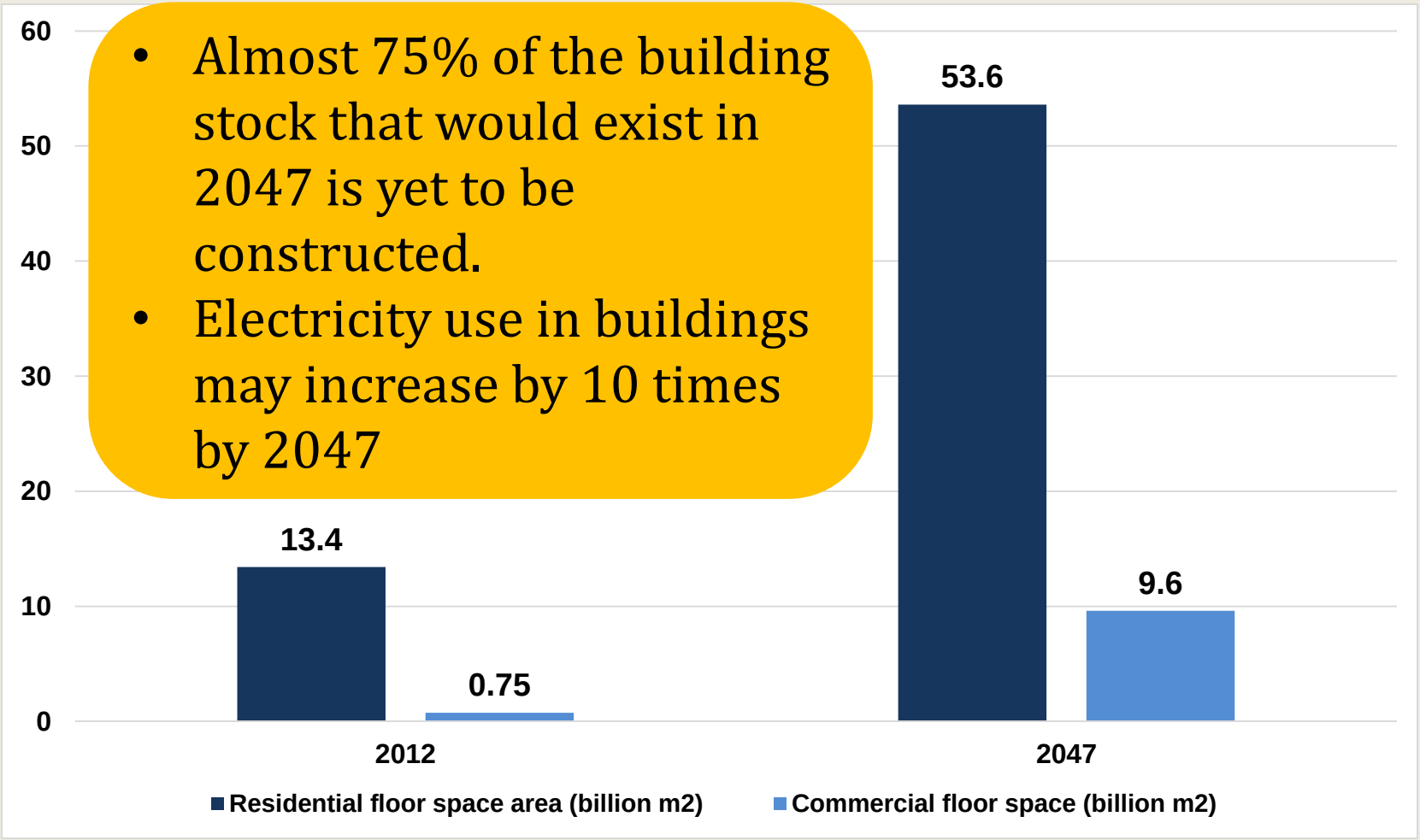
ENERGY IS LIFE
BEE
CONSERVE IT

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development
and Cooperation SDC

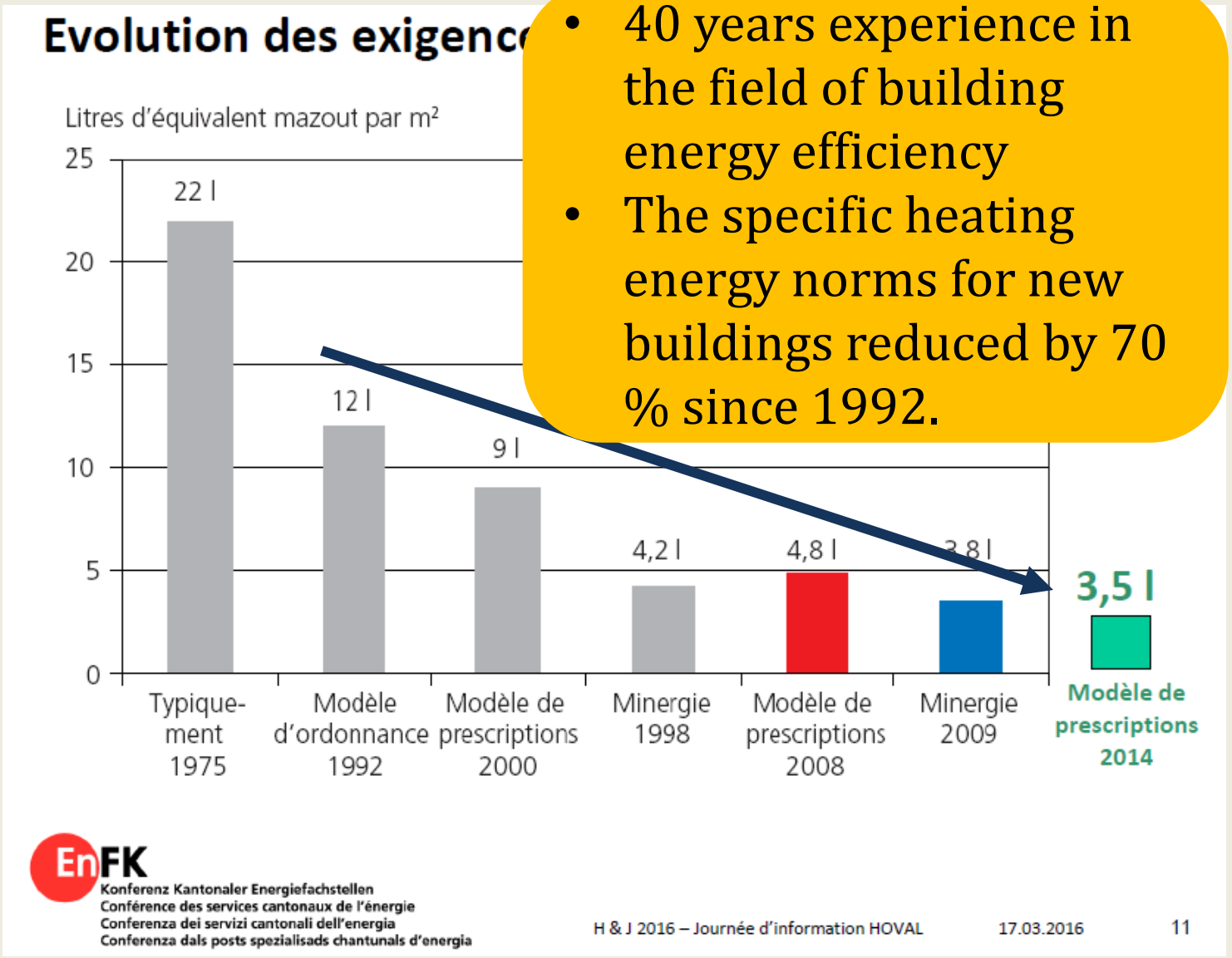
Indian Context

- Almost 75% of the building stock that would exist in 2047 is yet to be constructed.
- Electricity use in buildings may increase by 10 times by 2047



Source: India Energy Security Scenarios, NITI Aayog (2015) estimates based for 7.4% CAGR in GDP

Swiss Context



- 40 years experience in the field of building energy efficiency
- The specific heating energy norms for new buildings reduced by 70 % since 1992.

SET UP OF THE BUILDING ENERGY EFFICIENCY PROJECT (BEEP)

- **MoU** between Ministry of Power (MoP) & Federal Department of Foreign Affairs (FDFA)
  - 2011-2016
  - 2017-2021
- **Implementing Agencies**: Bureau of Energy Efficiency (BEE) & Swiss Agency for Development & Cooperation (SDC)
- **Project Management and Technical Units**: Effin'art, Switzerland, and Greentech Knowledge Solutions, India.

Indo-Swiss Building Energy Efficiency Project (BEEP) : Project Components

Building Design	**Design support to large building projects**
Building Technology	**Energy Efficient Building Envelope**
Building Policy	**Design Guidelines for Residential & Public Buildings**
Training & information	**Trainings, Seminars , Web , …**

BEEP (2011-2016): Achievements at a Glance

Design support to 18 large building projects

(Built-up area > 1.4 million $m^{2)}$

National Design Guidelines for Energy-Efficient Residential Buildings

Building Insulation Materials

(certified labs, training package)

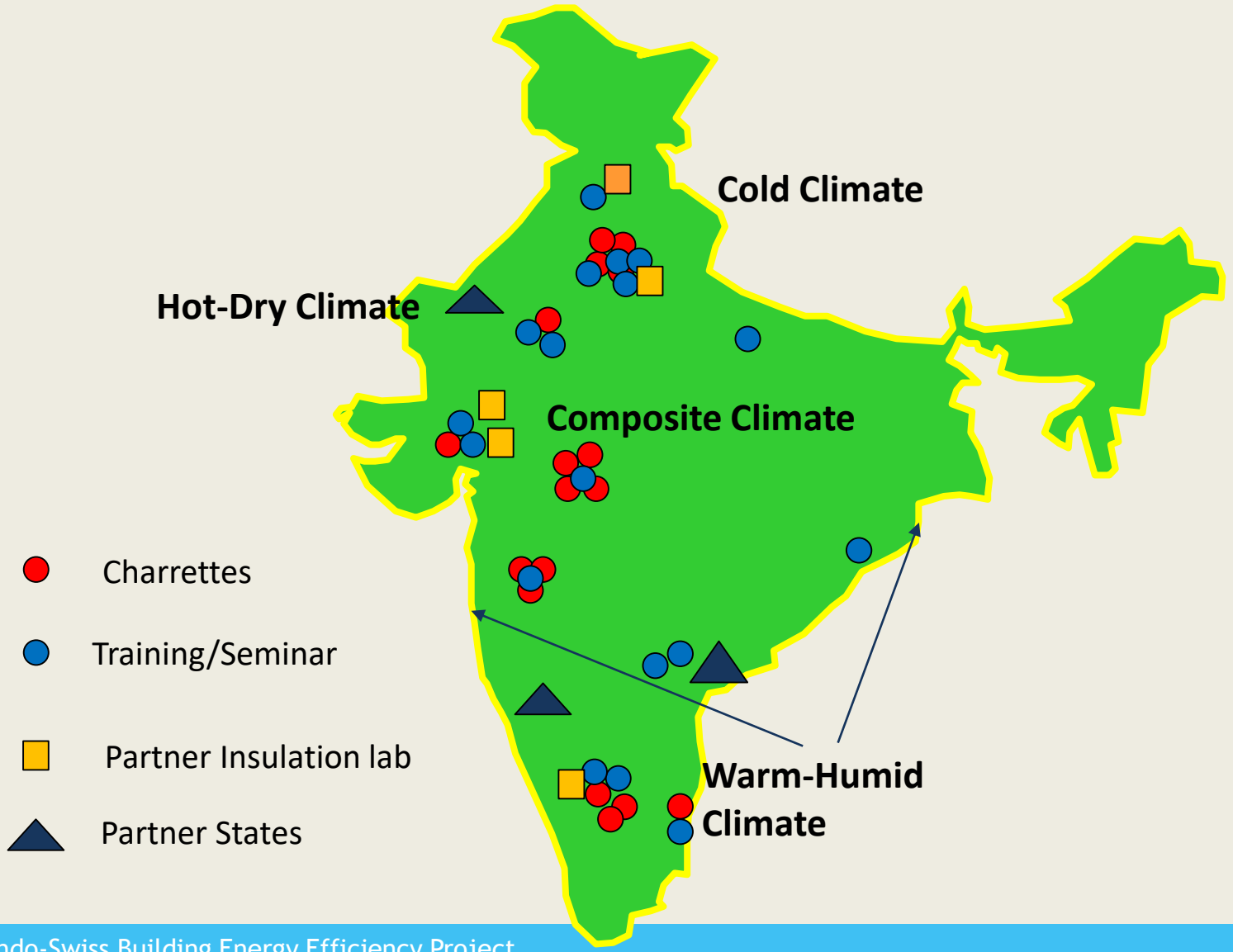
External Movable Shading Systems

(Design competition & promotion)

Public building design support to 3 states (Karnataka, Rajasthan & Andhra Pradesh)

Capacity building of >1000 building design professionals – Training programmes & city-level seminars

BEEP: Geographical Spread of Activities



Building Design

- Technical support to18 building projects (IT buildings, hospital, offices, residential complexes, academic institutions,..)
- >1.4 million m^2 built-up area
- 25-40% estimated energy savings

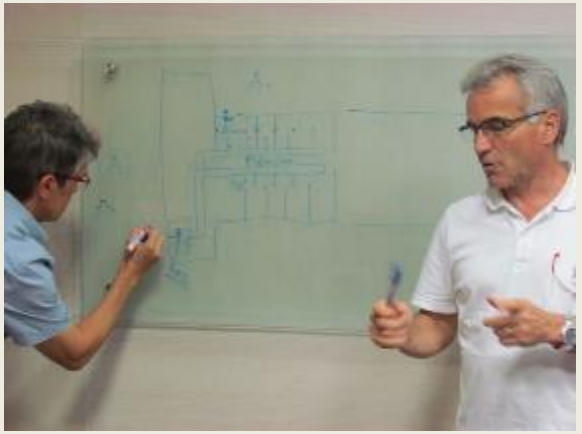
tial township

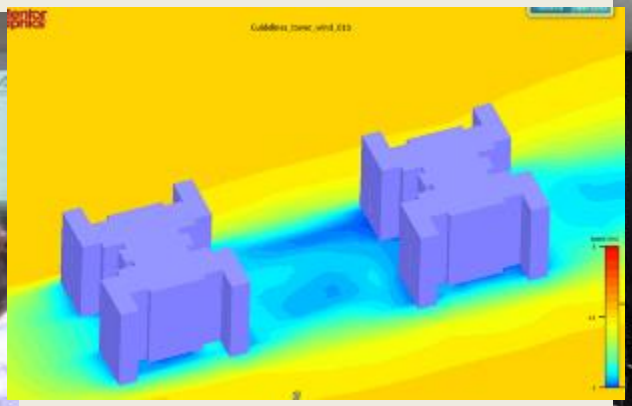
World Trade Centre

Office & Retail complex

Training institute & govt. office

Building Design



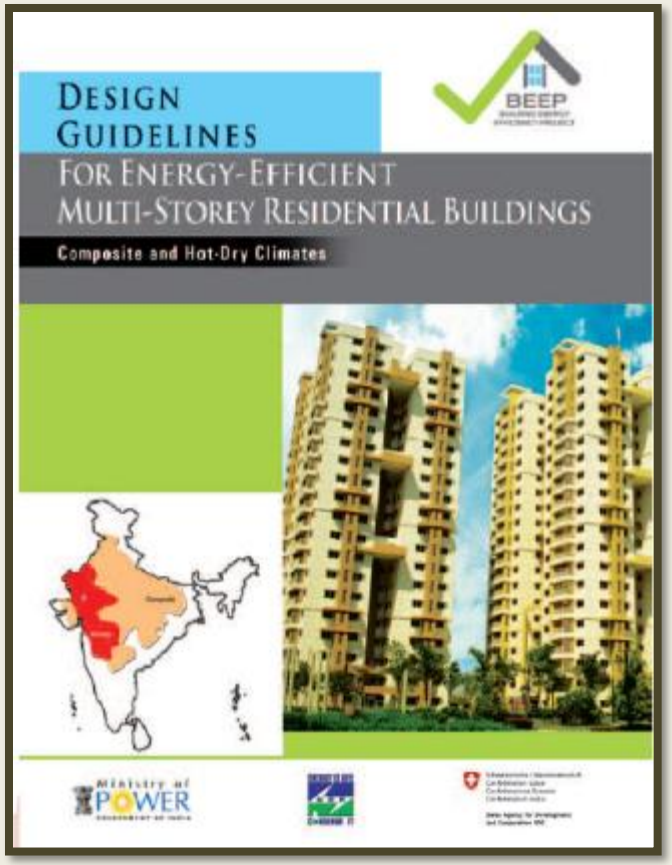


Example: Aranya Bhawan, Jaipur

Design support -2012
Building operational - 2015

40% electricity savings &
20% electricity from roof-top solar
(based on building energy performance measurements)

Design Guidelines for Energy-Efficient Residential Buildings



May serve as a reference for the development of an energy code for residential buildings in India

Design Guidelines for Energy-Efficient Residential Buildings – 15 key Recommendations

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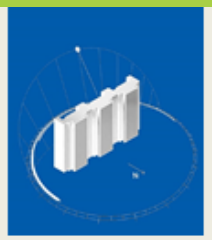


Massing & orientation to minimize / maximize solar exposure

Design and use of more efficient cooling / heating system. Efficient operating practices

Design wi
solar rad

se
or

Roof insula
heat

Wall insula
heat

to

Improve natural ventilation for fresh air and heat loss

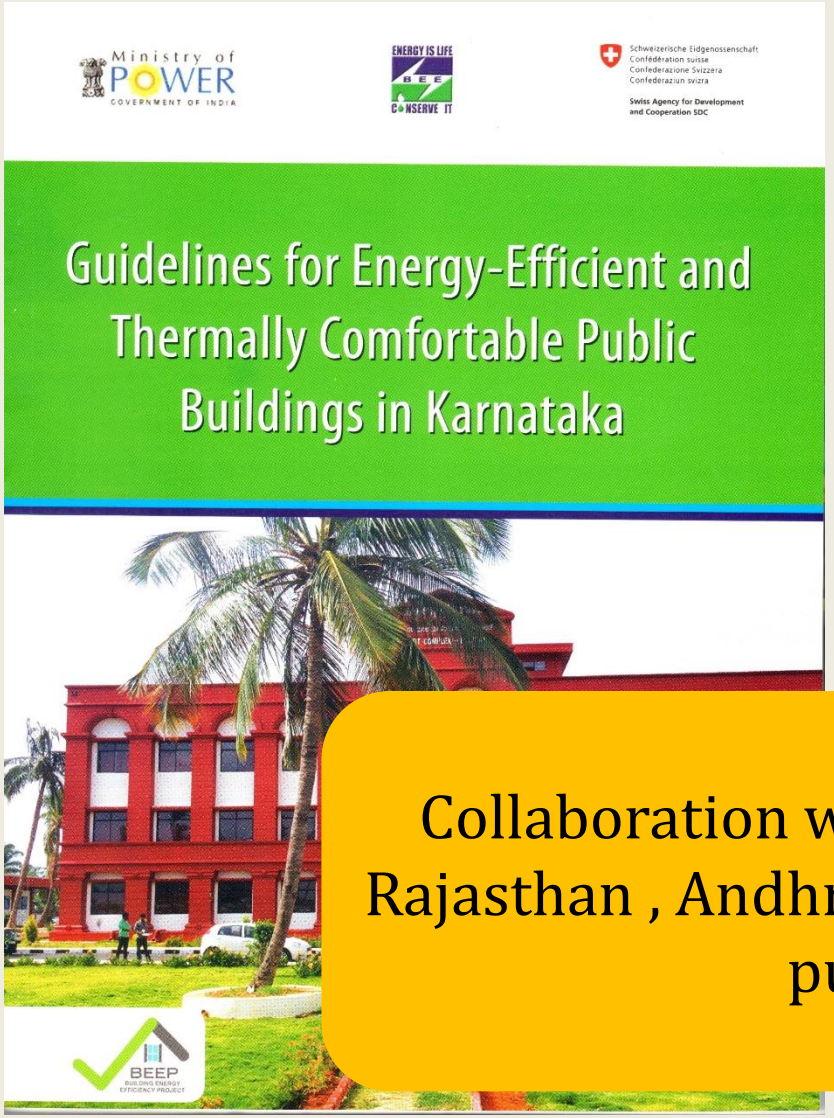
Solar water heaters

Detailed technical documents for 3 climate zones

Examples of application:

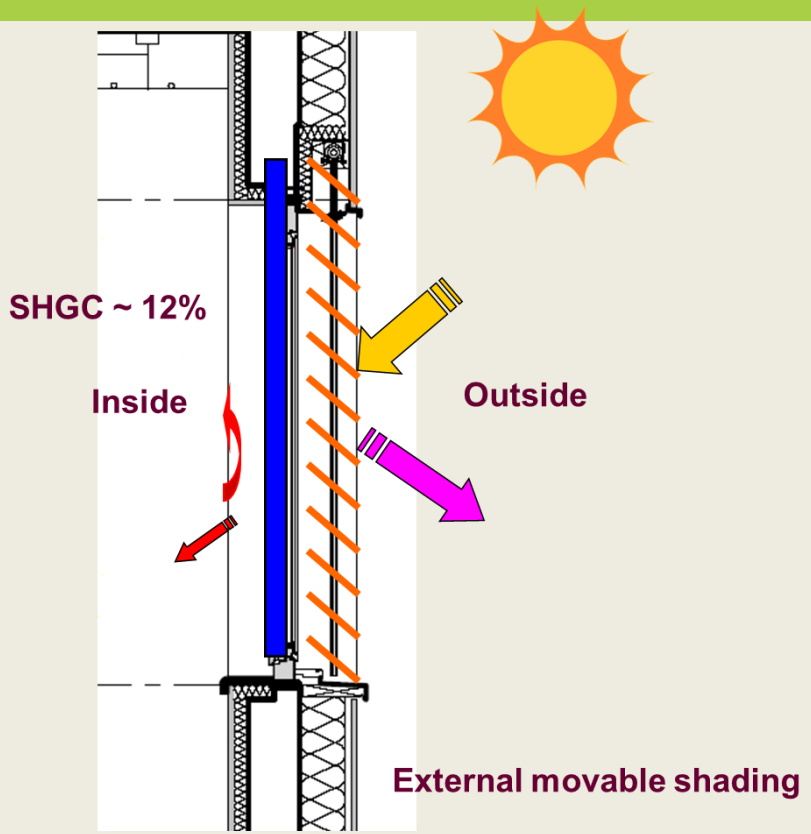
- Pradhan Mantri Awas Yojana project at Rajkot.
- Middle Income Housing projects in Indore & Chennai

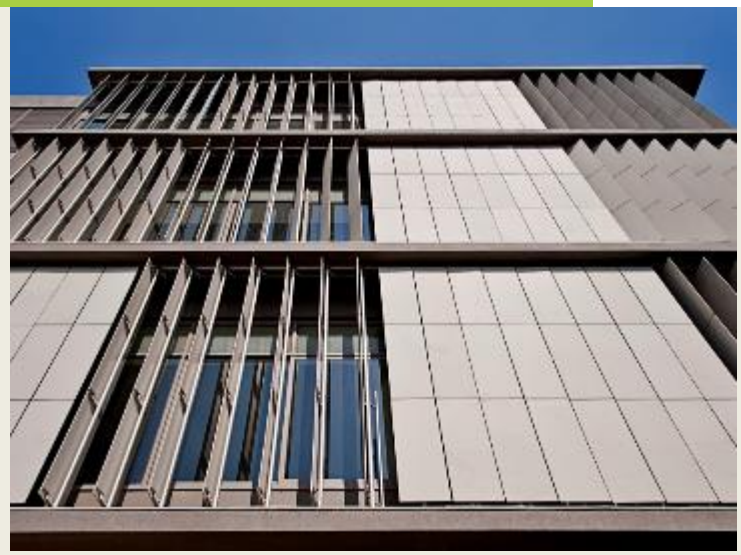
Design Guidelines: Public Buildings

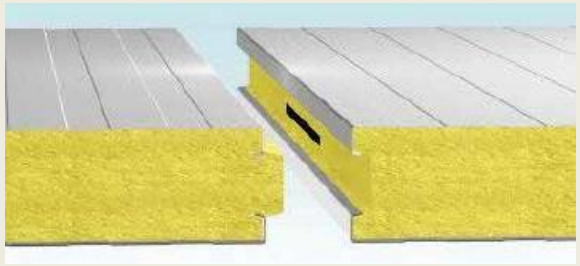


Collaboration with three states – Karnataka Rajasthan , Andhra Pradesh on energy-efficient public buildings.

Building Technologies: Energy Efficient Building Envelope

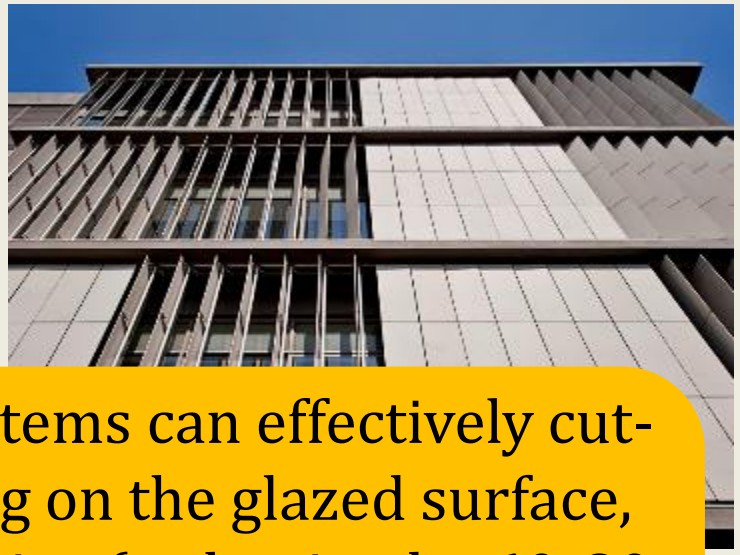




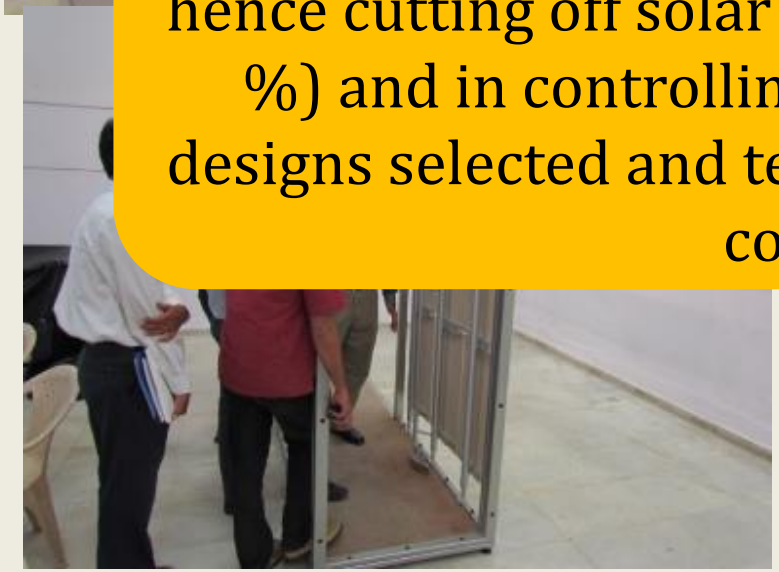


Technologies to reduce solar heat gains from glass glazings (External movable shading systems) and building insulation materials (wall & roof).

National Design Competition on External Movable Shading

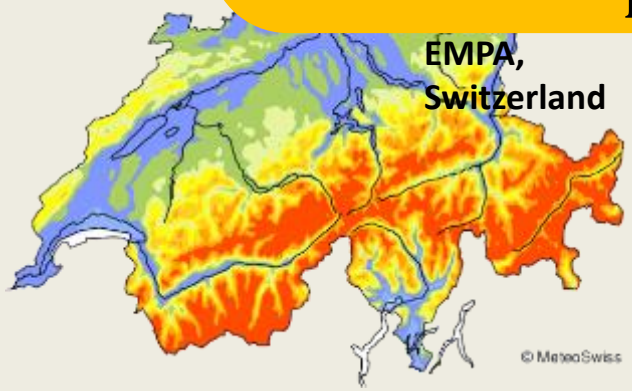


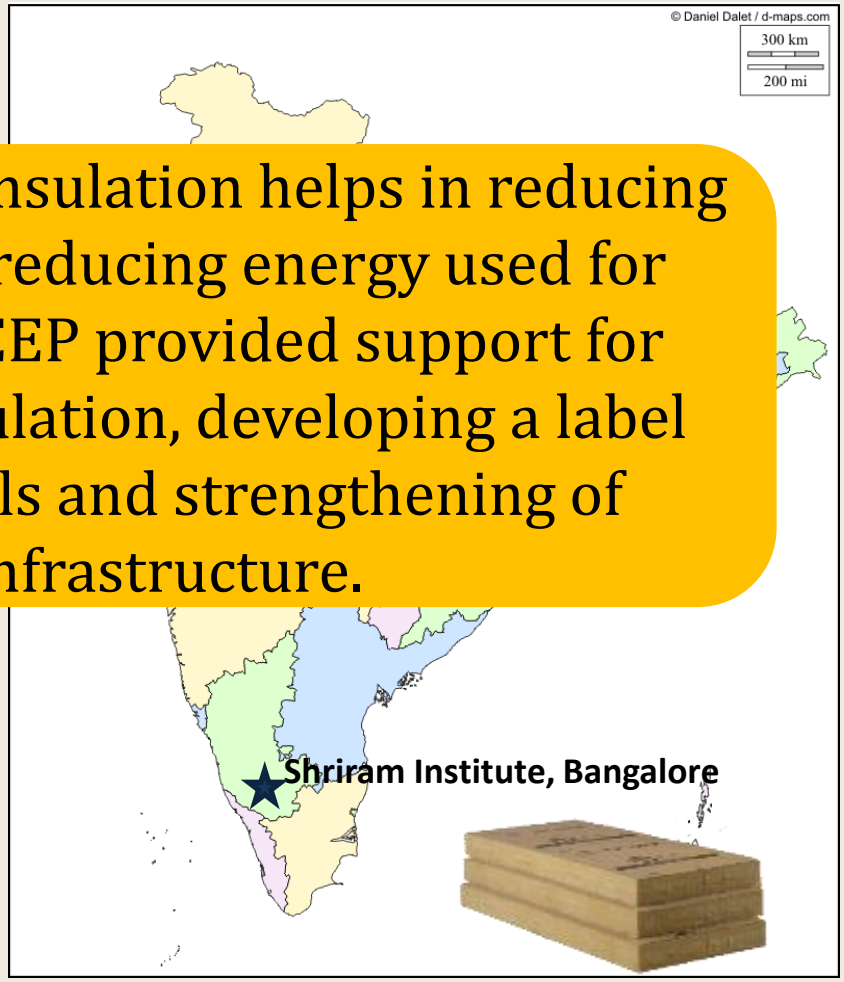
External movable shading systems can effectively cut-off solar radiation from falling on the glazed surface, hence cutting off solar heat gains (reduction by 60-80 %) and in controlling glare and daylighting. Five designs selected and tested under the national design competition.



Building Insulation Material

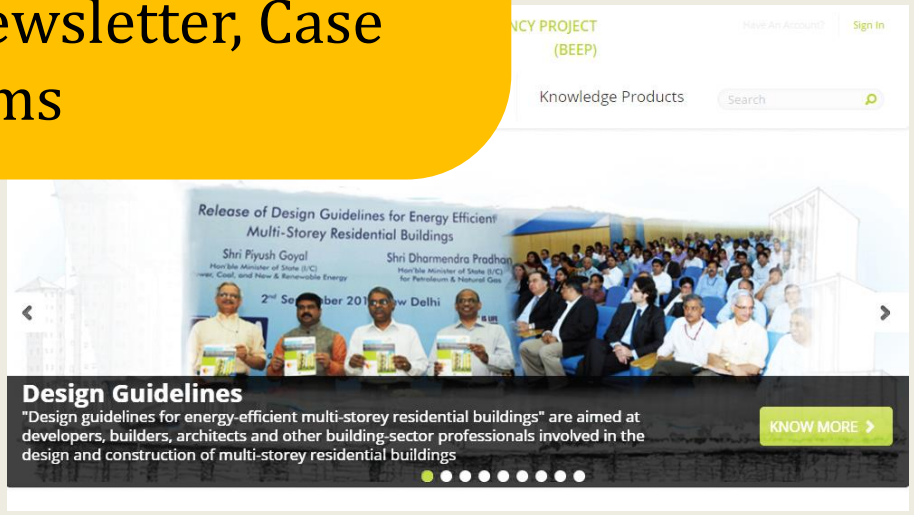
In hot climates, building insulation helps in reducing solar heat gains and in reducing energy used for cooling the building. BEEP provided support for training on building insulation, developing a label for insulation materials and strengthening of laboratory infrastructure.





Training & Information

- 20 training/seminars/ Field visits
- More than 1000 building design professional participants
- Website, Newsletter, Case studies, Films



BEEP: Looking Forward

2021

Scaling-up Phase

2016

2011

BEEP (2017-21) some focus areas:

- Code for residential buildings
- Mass adoption of energy-efficient envelope and natural ventilation concepts
- Accredited design professionals

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THANK YOU !
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