

# INDO-SWISS

# BUILDING ENERGY EFFICIENCY PROJECT

## EXTERNAL MOVABLE SHADING SYSTEMS (EMSYS)



CUSTOMISED ADJUSTABLE  
VERTICAL LOUVERS



FABRIC SCREENS



PROJECTION AWNINGS



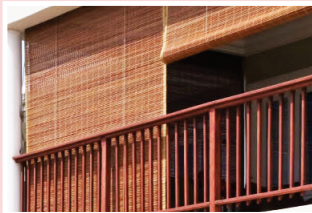
SLIDING SHUTTERS



SHUTTERS ON HINGE



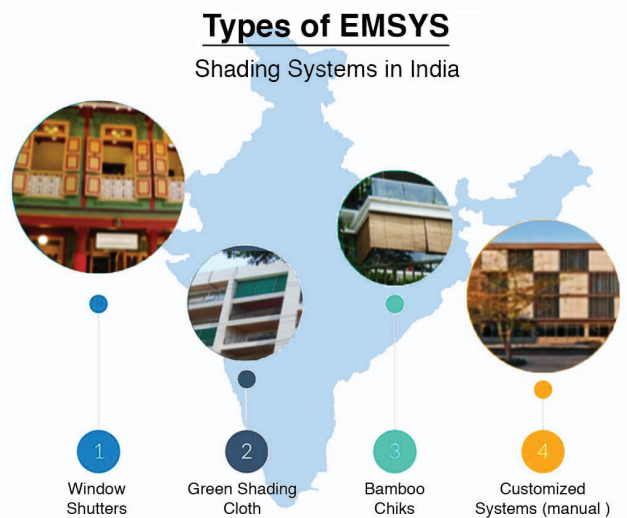
SLIDING FOLDING PANELS



BAMBOO CHICKS



ROLLER BLINDS



LYONNAISE JALOUSIES



LAMELLA BLINDS

## EMSYS HISTORICALLY IN INDIA

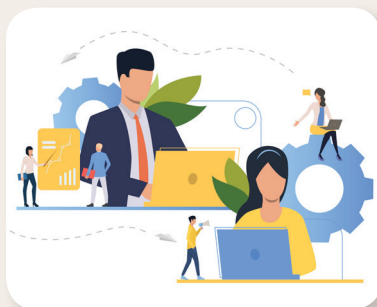
The concept of external shading is not new in India, where traditionally, some or other form of external shading has been used in hot climates to significantly reduce solar heat gains and provide natural daylighting. Some of these can still be seen in old “heritage” buildings across India.



## BEEP'S ACTIVITIES ON EMSYS



**National Design  
Competition**



**Assistance for Development  
of innovative products for the  
Indian market**



**Pan-India Manufacturer &  
Seller Association**



**Annual Workshop**



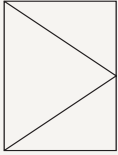
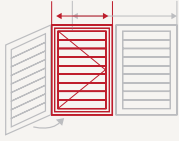
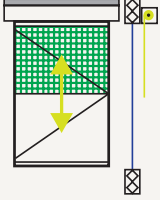
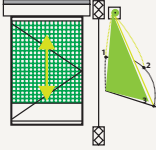
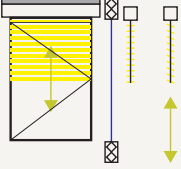
**Orienting the media on the  
importance of EMSYS**

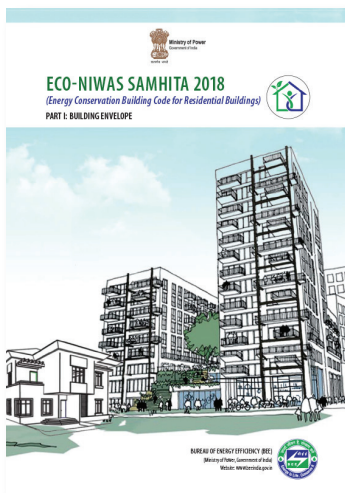


**Publications on EMSYS**

## IMPORTANCE OF EXTERNAL MOVABLE SHADING

External movable shadings systems (EMSYS) are used in buildings to improve thermal comfort and reduce cooling loads. EMSYS afford the best protection from solar heat gains from windows, which is the largest outdoor heat gain source in most buildings.

<p>Clear glass Single 0.88 Double 0.75</p> 					
Typology	Shutters	Roller Blinds	Vertical Awnings / Chicks	Projection Awnings	External Lamella Blinds
Solar Heat Gain Coefficient (SHGG)	0.1	0.1	0.1-0.25 (choice of textile fabric)	0.1-0.25 (choice of textile fabric)	0.08-0.15



- Better protection against solar heat gains (3-4 times more effective than DC glass)
- Permits adjustable natural daylight in the building

## COMPLIANCE WITH ENERGY CONSERVATION CODES BY USING EMSYS

With the launch and the subsequent adoption of Energy Conservation Building Code (ECBC) and Eco-Niwas Samhita, the Energy Conservation Building Code for Residential Buildings by various states, external shading will gain even more relevance in building design in India.

For building to comply to the standards specified in the code, without compromising on window to wall ratio or glazing, it will become necessary to use external shading on the windows.

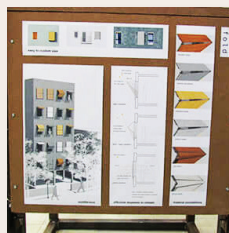
## WINNERS OF THE DESIGN COMPETITION CARRIED OUT BY BEEP

### Residential



**Touch Me Not** by Jurong  
Sustainable Urban  
Solution

Operation Position	Measured SHGC
Close	0.25
Intermediate	0.49
Open	0.72
Reference Glass	0.83



**One-Fold** by  
Banduksmithstudio

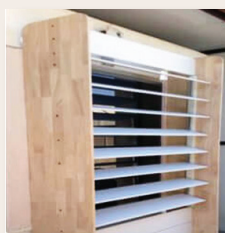
Operation Position	Measured SHGC
Close	0.12
Intermediate	0.58
Open	0.78
Reference Glass	0.83



**Fabric Twist**  
by Payal Chaudhari and Anto  
Gloren

Operation Position	Measured SHGC
Close	0.10
Intermediate	0.69
Open	0.73
Reference Glass	0.83

### Commercial



**Zula** by Keyur Zaveri

Operation Position	Measured SHGC
Close	0.06
Intermediate	0.29
Open	0.49
Reference Glass	0.83

**VRLS** by FACE

Operation Position	Measured SHGC
Close	0.09
Intermediate	0.45
Open	0.78
Reference Glass	0.83



## INDO SWISS BUILDING ENERGY EFFICIENCY PROJECT

The Indo- Swiss Building Energy Efficiency Project (BEEP) is a bilateral cooperation project between the Ministry of Power (MoP), Government of India and the Federal Department of Foreign Affairs (FDFA) of the Swiss Confederation. The Bureau of Energy Efficiency (BEE) is the implementing agency on the behalf of the MoP while the Swiss Agency for Development and Cooperation (SDC) is the agency in charge on behalf of the FDFA. The Project Management and Technical Unit (PMTU) is responsible for programme implementation which includes selected technical work, Management tasks programme and program outreach.

### PMTU India

**Greentech Knowledge Solutions** is a research and advisory firm based in New Delhi. It specialises in the fields of energy efficiency in buildings, resource efficiency in the production of building materials and renewable energy systems.

Telefax: +91 11 45535574



### PMTU Switzerland

**Effin'Art Sàrl**, based in Lausanne, is a consulting firm active in the field of building energy and sustainable architecture. It specialises in the fields of energy efficient design, renewable energy and HVAC design.

Telefax: +41 21 616 11 00



**Bureau of Energy Efficiency**  
Ministry of Power, Government of India  
4th Floor, Sewa Bhawan  
R. K. Puram, New Delhi - 110066 (INDIA)  
Website: [www.beeindia.in](http://www.beeindia.in)  
Visit us at [www.beepindia.org](http://www.beepindia.org)