



Building Energy Efficiency Project (BEEP)

CONTEXT

India's construction sector is experiencing unprecedented growth due to both a rising economy and population. Over the next decade, it is expected to grow at seven to eight percent annually. In fact, the total building floor area is expected to increase by four to five times between 2012 and 2047. From 2012 until 2047, the residential building area is expected to increase by four times, the commercial sector area by 13 times.

While growth is a positive indicator of India's development, it also poses considerable challenges in terms of energy demand and supply, as well as carbon dioxide emissions. At present, India's buildings account for 33 percent of the country's total electricity consumption. With the increasing building stock as well as the intensity of electricity consumption in urban buildings, mainly due to rapid growth of air conditioning, buildings will soon become the largest consumer of electricity in India.

In view of this, the Swiss Agency for Development and Cooperation (SDC) in partnership with the Ministry of Power, Government of India, is supporting a project to reduce energy consumption in new commercial, residential and public buildings.

OBJECTIVES

Energy consumption in new commercial, public and residential buildings in India is reduced through energy-efficient and thermally comfortable design and the application of renewable energy technologies. The project includes:

- **BUILDING DESIGN:** Energy-efficient and thermally comfortable building design adopted as standard practice by the Indian building sector.
- **BUILDING TECHNOLOGY:** External movable shading systems for windows and glazed areas in buildings developed and established in the Indian market.
- **POLICY:** Measures for energy-efficient and thermally comfortable buildings integrated in national, state and city-level policy.
- **OUTREACH:** Knowledge on energy-efficient and thermally comfortable buildings widely communicated.



Clean Energy & Energy Efficiency

PROJECT AT A GLANCE

Area: Mitigation

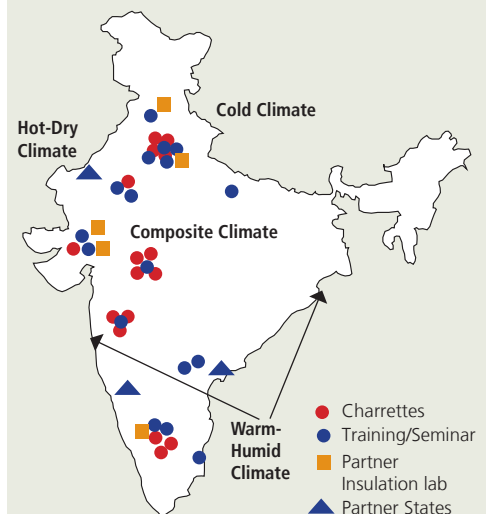
Duration: 2017 – 2021

Budget: CHF 7'000'000

Implementation Partners:

- Effin'Art, Switzerland
- Greentech Knowledge Solutions, India

Geographic Focus:



KEY ACHIEVEMENTS

- Energy conservation building code for the residential buildings launched at the national level by the Government of India.
- Guidelines for the design of energy-efficient multi-storey residential buildings for three climate zones in India released (composite, hot-dry and warm-humid climates).
- Technical advice to 40 building projects showed 25-40 percent energy reduction potential through better building design with minimal cost additions.
- Five Indian labs trained in testing building insulation material by the Swiss experts.
- Five new designs of external movable shading systems facilitated and tested.
- Templates developed for the design of energy-efficient public buildings for the states of Karnataka and Rajasthan.
- 3 unique BEEP student camps on integrated building design implemented to train young architects and engineers from about 50 Indian institutions.
- 3000 building professionals and students introduced to energy-efficient building design processes and specific strategies for energy efficiency in buildings.

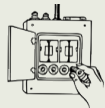


PLANNED RESULTS

- Strategies and capacities for mainstreaming of energy-efficient and thermally comfortable buildings developed for selected states.
- Competencies of selected builders/developers for energy-efficient and thermally comfortable building design enhanced through trainings and workshops.
- National award on energy-efficient and thermally comfortable building design established.
- Strategies and processes of energy-efficient and thermally comfortable building strengthened in architectural and engineering education.
- Simple manuals and online tools for applying energy-efficient building design measures developed and disseminated for large-scale applications.



IN NUMBERS



Buildings in India account for 33% of India's electricity consumption.



India's construction sector is expected to grow at 7-8% each year over the next decade.



As per the estimates of 2010, two-thirds of the commercial and high-rise residential buildings that will exist in 2030 are yet to be built.



The Energy Security Scenarios of India identify the building sector as a sector with one of the largest energy and carbon mitigation potentials.

ECO-NIWAS SAMHITA 2018

(Energy Conservation Building Code for Residential Buildings)



PART I: BUILDING ENVELOPE



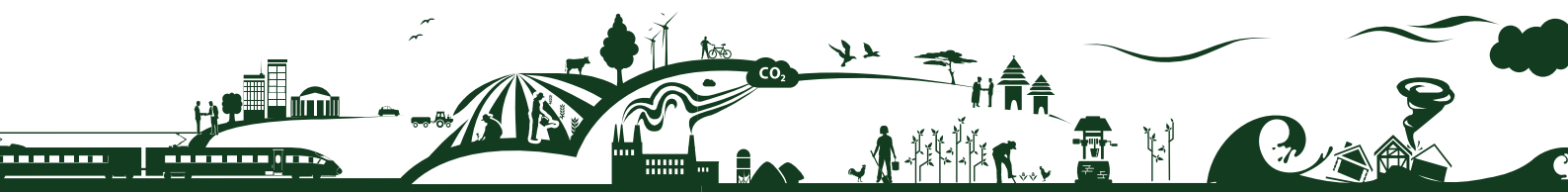
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ABOUT SDC IN INDIA

The Swiss Agency for Development and Cooperation (SDC) has been a partner of India for more than 60 years. Since 2011, SDC's engagement focuses specifically on climate change adaptation and mitigation, and other environmental challenges. The office in India is part of SDC's Global Programme Climate Change and Environment (GPCCE). Other SDC Global Programmes like Food Security, Water and Health also have ongoing activities in India, as part of their regional/global initiatives.

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Integration of Renewable Energy in Buildings in India (BEEP RE)

CONTEXT

The residential and commercial buildings in India account for about 33 percent of the electricity consumption, which is rising at nearly 8-9 percent annually. Population growth combined with increasing electricity demand and affordability for thermal comforts (mainly by using air conditioners) is expected to exponentially increase the energy consumption in buildings. The projections of Niti Aayog, a premier think-tank of the Government of India, estimate 6-10 times increase in electricity demand in commercial buildings and 4-10 times increase in residential buildings during 2012 to 2047.

India aims to achieve a total of 225 GW of installed renewable energy capacity by 2022. For the building sector, there is a growing understanding to make buildings shift from energy consumers to become energy generators by integrating different renewable energy technologies.

In view of this, the Swiss Agency for Development and Cooperation (SDC) is supporting a project on the Integration of Renewable Energy in Buildings in India. This project works in coordination with SDC's other on-going project on building energy efficiency (www.beepindia.org).

OBJECTIVES

The broad objective of the project is to design and demonstrate building integrated renewable energy technologies for commercial and residential buildings suitable to the local conditions.

The specific objectives are:

- Building integrated renewable energy technologies are demonstrated for up-scaling in India.
- Research and monitoring methods to measure the performance of systems are adopted by the practitioners.
- Knowledge on performance monitoring methods is effectively delivered to targeted stakeholder groups.



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PROJECT AT A GLANCE

Area: Mitigation

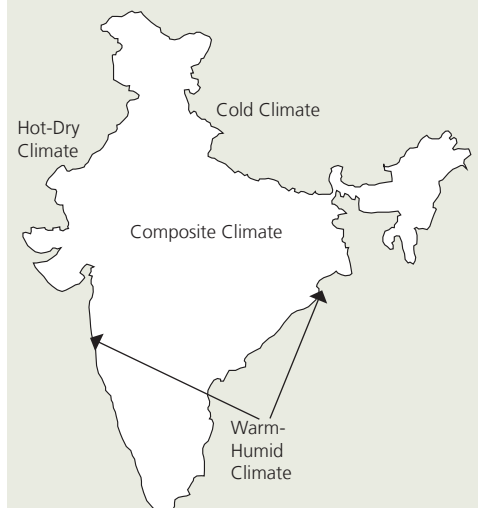
Duration: 2019 – 2021

Budget: CHF 750'000

Implementation Partners:

- International Institute for Energy Conservation (IIEC)
- Basel Agency for Sustainable Energy (BASE), Switzerland
- Environmental Design Solutions (EDS)
- Meghraj Capital Advisors Private Limited (MCAPL)

Geographic Focus:



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development
and Cooperation SDC

KEY ACHIEVEMENTS

- Technical assistance for integration of RE provided to a prominent developer on small wind turbine and solar hybrid system for residential building.
- Technology factsheet for 9 commercially viable RE technologies for building integration developed and disseminated to building sector practitioners.
- Tool for selection of RE technology for developed for building owners and developers for shortlisting appropriate RE technologies.

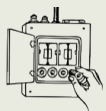


PLANNED RESULTS

- Business models developed to support the integration of renewable energy technologies in buildings.
- Commitments from technology providers, building/housing society management for integration of renewable energy at design stage.
- Research and monitoring methods to measure the performance of identified RE technologies are developed, released and distributed.
- Training modules and capacity building programmes developed for professionals and building sector practitioners for adoption of research and monitoring methods.



IN NUMBERS



Buildings in India account for 33% of India's electricity consumption.



India aims to achieve a total of 225 GW of installed renewable energy capacity by 2022.



India's National Solar Mission targets deployment of 100 GW of solar power by 2022.



Lead Photo and Photo 3 @SDC; Photo 2 @EDS

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