ENEL Triangle-based Omni-purpose Building (TOB): an integrated system to provide energy and services to population living in rural areas

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Abstract

The TOB project, conceived by the Enel Group to facilitate access to electricity to communities living in isolated areas, is Enel's response to the appeal from UN Secretary General, Ban Ki-moon, who dedicated 2012 to the fight against energy poverty, declaring it the International Year of Sustainable Energy for All.
The project dealt with the creation and development of TOB (Triangle-based Omni-purpose Building), a wood framed structure able to host a roof-integrated photo-voltaic plant and an energy management system that enable to provide energy and services within the modular and environmentally friendly structure. Services that may be provided range from ambulatory/infirmary to teaching rooms equipped with PC and videos, from lighting of the surrounding area to feeding of desalination systems for drinkable water.
Key aspects that drove the design are: low cost, use of locally available materials, easy transportation, flexibility to use local renewable resources, reliability, internal space available to provide services to populations; in addition, easy installation without concrete basements and capability to be installed and maintained by local manpower in order to facilitate social acceptance of the system were also pivotal in the architectural and technological choices.
Finally, the system is able to be adopted as the first hub of micro-grids that may be created in isolated areas to allow access to modern services and facilitate economic growth of populations living in the nearby.