

MAIN FEATURES

**PROTECTION-FOCUSED DESIGN
FOR PRIVACY & DIGNITY**

IMPROVED FIRE SAFETY & VENTILATION

**SOLID & DURABLE STRUCTURE
WITH POTENTIAL FOR UPGRADING**

**MODULAR & ADAPTABLE FOR
FAMILY SHELTERS AND COMMUNITY SPACES**

**INTEGRATED SOLAR ENERGY SYSTEM
FOR LIGHT & POWER**



BACKGROUND

The Refugee Housing Unit (RHU) is an innovative shelter solution resulting from a collaborative research & development project undertaken by Better Shelter and UNHCR, with the support of the IKEA Foundation. This partnership was formed with the aim of developing an improved shelter solution that provides greater dignity and supports the protection of refugees and other people of concern.





The RHU is comprised of a lightweight steel frame, a roof, wall panels, door and windows, floor covering, a solar energy unit, and an innovative anchoring system - no comparable product currently exists on the market. The production of the RHU by Better Shelter began in 2015 following extensive laboratory testing and field piloting in diverse climatic conditions. 15,000 units were subsequently deployed to multiple field operations in Europe, Middle East and Africa. Following these initial deployments, feedback from persons of concern has been extremely positive highlighting the contribution of RHUs in providing improved and dignified accommodation.

RHU 1.2

- **PARTICIPATORY DESIGN:** The RHU design draws on consultations with persons of concern, with user feedback integrated into the improved model design.
- **INTERNATIONAL STANDARDS:** The RHU design is in line with SPHERE standards, and provides the recommended minimum living space for a family of five.
- **SUPPORTING SOLUTIONS:** Within the context of a phased response, RHU's can be upgraded with local materials in support of more durable shelter solutions.
- **CONTEXT-SPECIFIC:** The RHU has a modular and robust structure that allows its use in a range of contexts from family accommodation to community spaces.
- **SOLAR ENERGY:** The RHU provides 6 hours of electricity supply for lighting, while providing plugs for the charging of electronic devices.



RHU 1.2

 40°C 5°C			
Temperature range	4 people required for assembly	5-6 hours assembly time	3 years lifespan

TECHNICAL CHARACTERISTICS

Weight per unit	161 kg
Packing volume	1.13 m ³ (including box A and B)
Materials	Frame: galvanized high strength steel Wall & Roof: semi-hard & opaque plastic panels
Floor area	17.5 m ² of covered living space
Structure	Frame of steel pipes connected through steel joints and braced with cross wires. The foundation frame is anchored to the ground with an innovative footing system
Lifespan	36 months with basic maintenance 18 months without maintenance
Shelf-life	5 years in dry, clean and ventilated conditions
Fire safety	Allows users to evacuate in a minimum time of two minutes in case of fire
Wind resistance	Withstands 18 m/s or 65 km/h
Estimated cost	€ 1,095 per unit

Solar energy unit



THE DESIGN

ANCHORING SYSTEM

The RHU includes a sophisticated anchoring system to secure the RHU to the ground. Each foot anchor consists of one 500mm ground pipe connected to a ground plate and a ground joint. The anchor is connected to the plate with a steel wire.

STEEL FRAME

A solid, prefabricated, steel structure which consists of ten vertical poles to connect the anchoring system (footing) of the RHU with the roof structure. This system was designed to mitigate the impact of climatic conditions and promote durability.

SEMI-HARD WALL AND ROOF PANELS

Aside from the frame, the RHU uses two types of panels: roof panels and wall panels. The panels are produced from a 5mm thick polyolefin sheet with a UV barrier on the outside and a reinforcement layer on the inside. These materials were developed to provide of an improved living environment.

SOLAR ENERGY UNIT

The RHU includes a solar panel to power an LED lamp and provides plugs to charge low voltage devices (e.g. mobile phone). The solar panel is simple to use and easy to install.

LOGISTICS

The prefabricated RHU 1.2 is delivered in a “ready-to-assemble” kit. To facilitate assembly, the kit is split into two packages; part A and part B. For shipping purposes, transport can be organised by air, land or sea, while the kit volume will allow for the transportation of 48 units in 40 feet HC container and 36 units in 40 feet DC container. Transportation costs, per unit, are between USD 170-200 (depending on location), while assembly costs should be calculated on the basis of a set-up time of 5-6 hours by 4 trained individuals.



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Steel frame



IMPLEMENTATION SUPPORT

Given the specific technical and logistical considerations associated with the field implementation of the RHU, the Shelter and Settlement Section is available to provide technical support to implementing operations. Training of Trainers (ToT) technical workshops will be organized for UNHCR staff and implementing partners deploying RHUs providing specific guidance with regard to implementation planning, assembly, risk mitigation (including fire) and maintenance. This training is supported by a detailed RHU assembly manual to facilitate subsequent trainings in field locations. The Shelter and Settlement Section can also provide support with regard to logistical arrangements for the delivery of RHUs to the country operations.



RHU ToT training