



SUN<sup>x</sup> is an evolving global network of innovative, cost-effective, solar-powered buildings at its core called **SUN<sup>x</sup> Centres**. Each is delivered in a single container and is easily positioned in a range of communities particularly national parks, urban centres and heritage sites.

Manufactured by the SUN-ARK corporation [www.sunark.eu](http://www.sunark.eu)

# What is a SUN-ARK?

**SUN-ARK is a multi-purpose building which can be transported anywhere by road and by sea. It can be constructed by unskilled local labour, using simple tools. It needs no traditional foundations or floor slab.**

SUN-ARK generates 50-80,000 kilowatt hours per annum (dependent upon local weather and radiation patterns) using its custom-designed photovoltaic system. This renewable solar power can be used within the Sun-Ark for many specialist applications, or it can be distributed externally by AC or DC to nearby buildings, tents, factories, shops, storage areas etc.

SUN-ARK answers many of the world's needs for developing countries' off-grid areas, and the immediate problems of temporary camps, displaced communities and disaster areas. In addition, it has significant potential in the areas of Green Growth and Impact-Travel.

SUN-ARK has been developed with our Polish partner, Sustainable World of Technologies (SWOT) and was launched at UNEP's Conference in Warsaw in 2013 (COP19)



# SUN-ARK Building Design



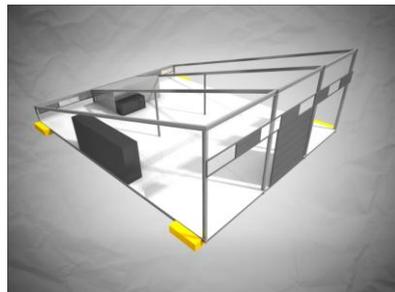
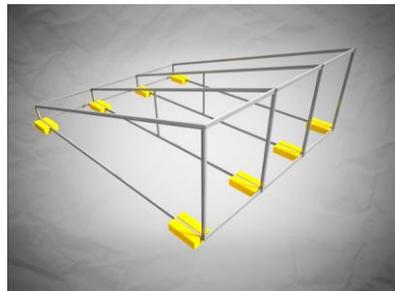
Sun-Ark is a wedge-shaped building, constructed with galvanised cold-rolled steel profiles (manufactured by VoestAlpine) or with laminated wooden frame (designed by UHC). The steel/wood alternative will enable a suitable choice for each location.

Sun-Ark has a roof which is covered with a state-of-the-art photovoltaic system, designed by BIPVco.

The building is 20m x 12m (240sq.m) as a single unit, but units can be combined into larger structures.....multiples of 240sq.m.....or as a half-size SUN-ARK (10m x 12m)

The building has suitable long-lasting insulated walls, doors, windows, rainwater collection system, energy-storage and distribution systems, lighting, and a heating/cooling system.

# Construction & Performance



The building can be erected without cranes, as the individual components are kept to a handle-able weight. No traditional foundations or floor slab are required – only levelled and compacted ground. The building is secured by screw-piles (which can also be thermally linked) or by a simple ballasted system.

The Photovoltaic system has been specifically designed for these buildings in typical locations, by BIPVco. The system will generate 50,000-80,000 kilowatt hours of solar electric power per annum from each SUN-ARK, depending upon the radiation pattern of the location. The system has notably efficient energy storage capacity and distribution can be AC or DC. Charging stations for external portable batteries will be an option.

Each SUN-ARK will be fitted out for a specific application, with options for the doors, windows, flooring, PV system, and all the usage systems

# Key Components



- Lightweight steel frame
- Alternative cross-laminate timber frame
- Insulated walls and roof
- Doors and windows (optional sizes)
- PV roof system
- PV power storage and distribution
- Rainwater collection system
- Flooring alternatives
- Screw-piles



# SUN-ARK Usage



SUN-ARK's have a versatile range of uses from climate innovation and learning centres to disaster response infrastructure. SUN-ARK's provide cost-effective solutions to many of the problems that the international community is trying to solve.

**Renewable energy**

**Communications**

**Medical services**

**Water-aid**

**Agricultural aid**

**Shelter**

**Local industry start-ups**

**Education and training**

**Social focus centres**

Installation and maintenance will be undertaken by local labour, assisted by experienced SUN-ARK supervisors. Where agreed local suppliers and contractors may also be used subject to quality assurance.

**IF YOU HAVE THE SUN, YOU HAVE EVERYTHING**



# Disaster Response



- SUN-ARKs perform an essential secondary role as disaster and emergency response infrastructure
- Clearly the placement of significant power-generating buildings on a planned basis will be a suitable part of the reaction to major natural disasters such as hurricanes and tsunamis and floods. SUN-ARK is not the only solution, and past disasters have seen similar answers found.....but a specifically-designed SUN-ARK as a 'standardised' building, stored and quickly available for all major disasters and emergencies.

# Supporting Emergency Response



In recent years the number of manmade and natural disasters has intensified and the impacts increased. Climate change will accentuate this.

Travellers pose special challenges in terms of safety, international links, housing and repatriation.

SUN<sup>X</sup> has built-in elements in its connectivity and training that provides communities with an additional line of defence. It builds links with global Travelism defence systems and provides expertise to help response.



# Communications; Satellite & Super Wi-Fi



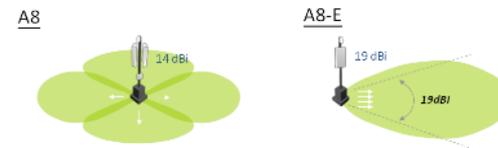
Access to the internet has become one of the ‘basic requirements for worldwide opportunity’  
 Currently, 4 billion humans do NOT have that access

The systems for internet access are developing in favour of those 4 billion. There is satellite coverage which will connect with satellite receivers on the ground in many remote areas. This is already used by military or journalistic staff.

And there is use of ‘TV White Space’ – commonly known as Super WiFi. This system broadcasts communication and the internet in the (now) unused radio frequencies which used to broadcast analogue TV. Use of these frequencies and the broadcasting towers means that wi-fi signals can be sent through obstructions and for much greater distances than wi-fi from a conventional router.

SUN<sup>x</sup> is working with Microsoft, who are already undertaking trials in Africa

**Super WiFi Extended Range up to 5 km!**  
*Furthest WiFi Access in the Industry!*



Range up to	A8 + Laptop	A8E + Laptop	A8 + C1	A8E + C1
Rural	1	1.7 km	4 km	5 km
Suburban	500 m	800 m	2.5 km	3.5 km
Urban	350 m	500 m	1.5 m	2.5 km
Dense-urban	250 m	350 m	1 km	1.5 km



**For further details please contact:**

Professor Geoffrey Lipman, SUN<sup>x</sup> Co-founder, [glipman@thesunprogram.com](mailto:glipman@thesunprogram.com)

Olly Wheatcroft, SUN<sup>x</sup> Program Manager, [olly@thesunprogram.com](mailto:olly@thesunprogram.com)