

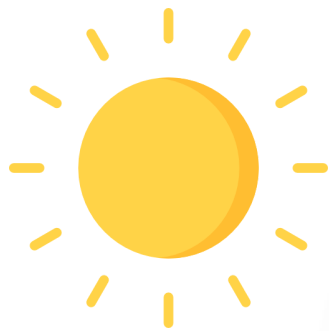
CLEAN & PORTABLE
LIGHT

SOLAR LANTERN



**Humanitarian Engineering and
Energy for Displacement**

HEED PROJECT



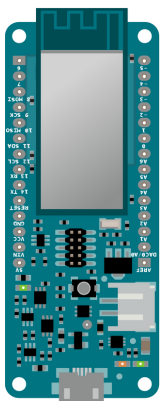
Solar mobile lanterns are a popular and cost-effective way for refugees and Internationally Displaced People (IDPs) to receive light at night. Little is known however about the degree solar lanterns are used as a static source of light or as portable devices. In this context the HEED project aims to generate quantitative research on the uptake and use of solar mobile lanterns by tracking usage through sensor-based monitoring. This will help us to better understand how solar lanterns are used and make recommendations for improvements in the design of lanterns where appropriate.



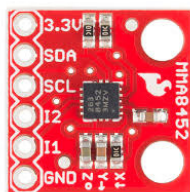
The HEED project will monitor how solar lanterns are currently being used by people living in camps. The data produced will identify how much energy is consumed, where it consumed and whether it is sufficiently sustainable to meet the needs of refugees and internally displaced people.



Solar Lantern



Arduino MKR



**Accelerometer to
monitor movement**

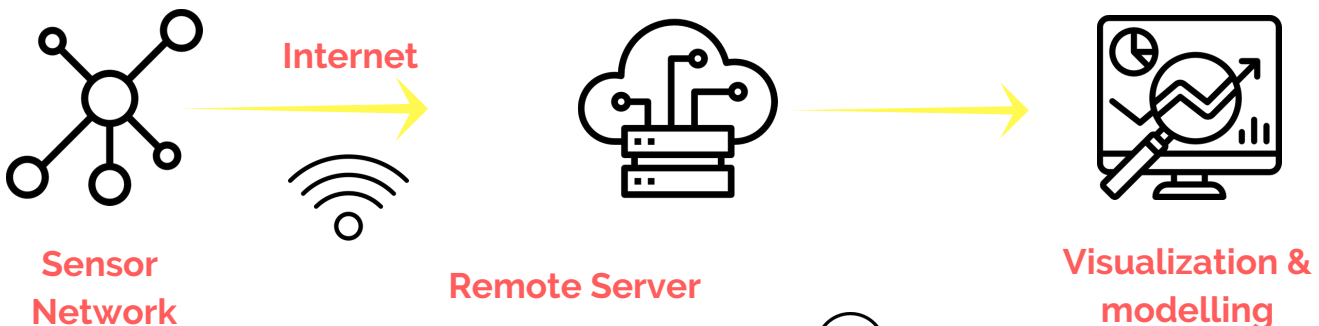
SENSOR-BASED MONITORING SYSTEM



The sensor-based monitoring system makes use of a 3G-enabled Arduino microcomputer. This microcomputer is interfaced with an accelerometer, and bespoke circuitry to measure the lanterns energy state (on/off/charging) as well as the battery voltage.

The sensors will send data remotely to Coventry University. This data will then be analysed to understand lantern usage. The sensor will not impact on the use of the lantern and the data will not be used for any other purpose.

Sensing & Monitoring Process



Summary



Using sensor-based monitoring systems the HEED project will gather new evidence on the use of solar lanterns through the collection of empirical data. This evidence will be used to improve the design of mobile solar lanterns to delivery increased access to cost effective, sustainable sources of light that meet the refugees and internally displaced people.