

Costs Savings and Business Continuity through Solarisation

A 3W on Financing Solarisation
October 2025



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1. Why finance solarisation?

Cost efficiency

[Six large UN humanitarian agencies plus ICRC alone spend over US\\$ 108 million/year on generator fuel.](#)

Payback is usually 3-5 years. Net savings of over US\$70,000 over a 10-year life-span are possible.



Business continuity & security

When relying on generators, purchasing and transporting generator fuel can be disrupted, e.g., if flooding or emergencies impact infrastructure, or it is subject to theft. Solarisation can reduce/eliminate this risk.



Decarbonisation

Solarisation supports decarbonisation goals aligned with the [Climate and Environment Charter](#), [REH Commitment](#), and donor priorities. For instance, solarisation enabled the [DRC Afghanistan office to cut 86 tCO₂—equivalent to planting about 930 trees](#)



However, **upfront investment to solarise can be a challenge**. This 3W shows what the numbers are telling us and what humanitarian organisations are doing to overcome this challenge. It serves as **inspiration for others how to get started, equipping them with figures and examples** to solarise field facilities, taking a crucial step towards supply chain sustainability during emergency operations, cost savings, and decarbonisation.

2. Key insights¹

Realised savings are significant and become pronounced after several years. Figures suggest realised net savings of over US\$70,000 over a 10-year life-span, highlighting the importance of a **multi-year perspective** and total cost of ownership when considering solarisation.

Upfront investment can be close to annual energy spending on generator fuel/grid electricity – and yet meeting it can be challenges since it requires different budgeting and careful projection of cost reduction after solarisation.

Payback times are short, yet in times of high project turnover and sudden onset crisis, multi-year payback is a challenge. Organisations can start with facilities that consume above-average amounts of energy and use generated savings to invest in other facilities.

Some ways to address upfront investment are underutilised. Many organisations still rely on ‘classic’ donor funding and core funds to finance solarisation. Considering increasingly tight funding envelopes on the one, and savings potential thanks to solarisation on the other hand, innovative finance mechanisms could be further explored: Country offices could explore power purchasing or revenue

¹ While not representative of the entire humanitarian community, this 3W provides important insights into trends for financing solarisation.

generation from waste. HQ could support country offices through setting up revolving funds or derisking or bundling solarisation projects.

Solarisation is as much about cost saving as it is about emission reduction. It is a win-win that makes business sense which means donors and organisational alike should make every effort to solarise field facilities. Realised savings means being better equipped to serve affected population effectively while embracing the do no harm principle.

3. Detailed results

3.1. Benefits from solarisation

On average, solar equipment covers 47% of annual energy demand.

All organisations considered here save money thanks to solarisation. Most save over US\$ 5,000/year, and several over US\$ 10,000/year see **Error! Reference source not found..** This will be compared against upfront investment in the following section.

Danish Refugee Council Afghanistan country office also covers 100%. SCI Sudan covers 100% of power needs for 6 out of their 18 offices.

The question is not whether solarisation makes financial sense, but how to meet to upfront investment costs in times of tight budgets.

“We recently installed a 60-kW solar system at our Country Office. As a result, we [...] reduced electricity costs by around 70%. This translates to an annual savings of approximately USD 15,000 for the Country Office alone.” Danish Refugee Council Afghanistan Office.

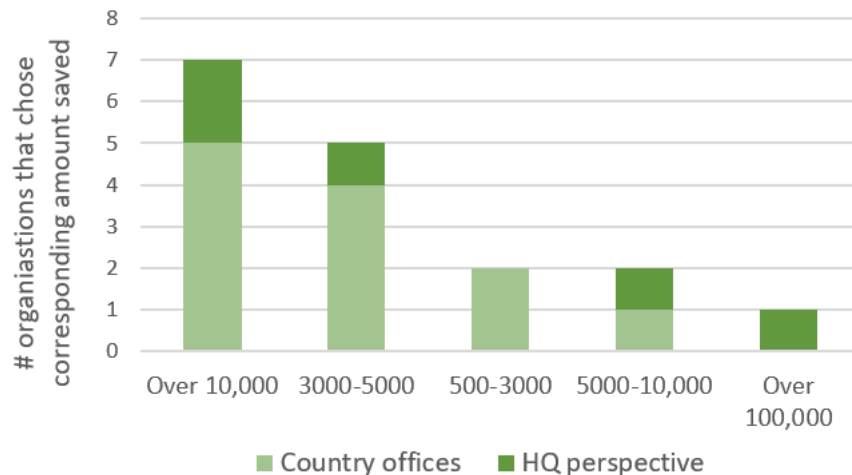


Figure 1: Realised savings/year thanks to solarisation

The number one benefit as expressed by partners from solarisation is emissions savings, closely followed by cost savings, see **Error! Reference source not found..**

Figure 2 shows that solarisation isn't only about emissions reduction: it makes good business sense and is a vital component in effectively

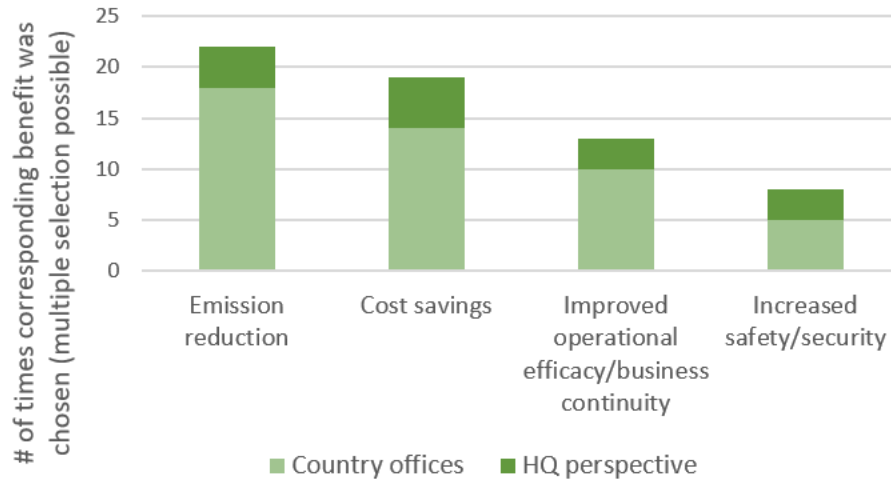


Figure 2: Solarisation benefits

3.2. Upfront investment & payback times²

Most organisations at the country level report investing between US\$ 10,000 and US\$ 50,000 to solarise their facilities, see Figure 3. However, partners from headquarters often report higher levels of investment due to covering multiple locations. **Before solarisation, typical annual spending on generator fuel or grid electricity exceeds US\$10,000 (see Figure 4). Compared to the typical upfront cost of solarisation, this shows that solar power can quickly pay for itself - especially in areas with high energy costs.** However, the speed of cost recovery depends on how much a facility relies on full solarisation versus hybrid systems and on local energy prices. Understanding payback times is key to maximizing financial benefits from solarisation.

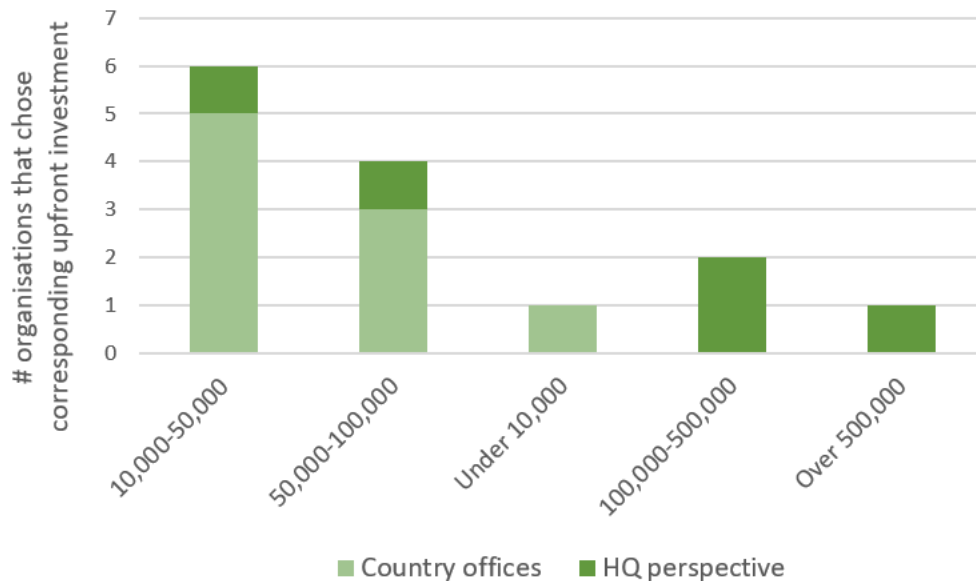


Figure 3: Average upfront investment to solarise field facilities, in US\$.

² Data entries are split by country office and HQ.

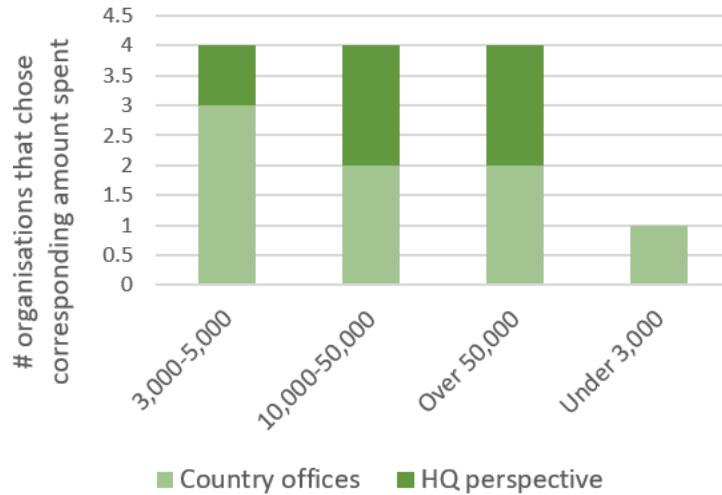


Figure 4: Average amount spent on generator fuel consumption and/or grid power supply per year, prior to solarisation, in US\$.

Figure 5 shows payback time is 3 to 5 years for the majority of organisations, several cite less than 3 years payback time. **Assuming a US\$30,000 upfront investment paid back over 4 years and annual savings of US\$10,000, solarisation—assuming equipment lasting over 10 years—can conservatively yield more than US\$70,000 in total savings³.**

Payback will vary with fuel and energy prices, and level of energy consumption. A facility where fuel prices are very high and that consumes lot of energy e.g., due to cooling needs for medical items may experience lower payback times than one where fuel prices and energy consumption are moderate. This means an organisation should undertake an energy needs analysis (or audit)⁴ and prioritise facilities in areas with high prices and high consumption

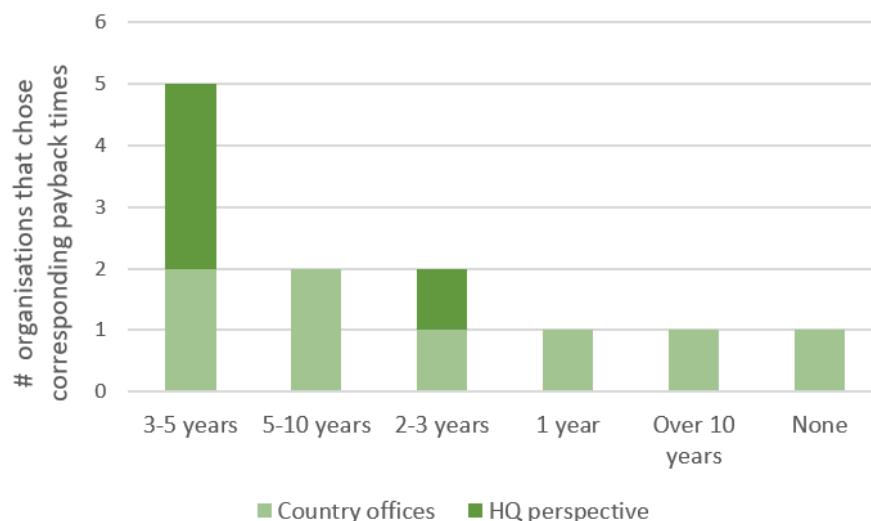


Figure 5: Payback times for solarising field facilities.

³ Assuming net savings of US\$ 10,000/year where any repair and maintenance costs are already deducted. See also the [Total Cost of Ownership steps](#) outlined in 'Solarisation of Facilities Operational Guidance guide', by the International Medical Corps (IMC) p. 22.

⁴ See for example the Logistics Cluster [Energy Consumption Calculator](#) or the [ReAct tool](#).

3.3. Ways of financing upfront investment

Looking at Figure 6, most organisations reported using two ways to finance upfront investment for solarisation⁵:

- **HQ/core funding:** Many organisations use a portion of their core funds to finance upfront solarisation costs.
- **Donor funding designated to sustainability/solarisation:** Many organisations still rely on submitting conventional funding proposals to donors.
- **Designated internal funding programme for sustainability:** Organisations setting up a funding programme offering grants for sustainability measures.

Less-utilised solarisation funding strategies include:

- **Revolving funds:** *NRC* and *UNHCR* have established revolving funds that reinvest savings from solarisation into financing additional facilities. This creates a sustainable cycle of investment and expansion.
- **An internal carbon tax:** *WFP* has set up an internal carbon tax on flights and vehicles which finances decarbonisation measures such as solarisation.
- **Power purchasing agreements:** *IRC Nigeria* is exploring this to avoid high upfront investment costs.
- **Mixed strategies:** *DRC Afghanistan* combines core funding with internally generated revenue (e.g., from waste) to support solarisation efforts.

NRC has a capital fund that pays upfront costs. Country offices repay over time charging to projects benefiting from the energy. *UNHCR* set up a [Green Finance Facility](#) where smaller offices are solarised through a revolving fund: Savings from solarisation are reinvested.

WFP has a carbon tax on commercial air travel and light vehicles. Revenue is used for their [Decarbonisation Fund](#) and Energy Efficiency Programme which has funded solarisation in over 20 offices.

IRC Nigeria is pursuing a Power Purchasing Agreement (PPA) for their facilities, thereby avoiding upfront costs of over US\$ 1 million.

⁵ This list is not comprehensive and other funding mechanisms are possible. See also the [WREC Coalition GHG Info Session on Financing Solarisation](#).

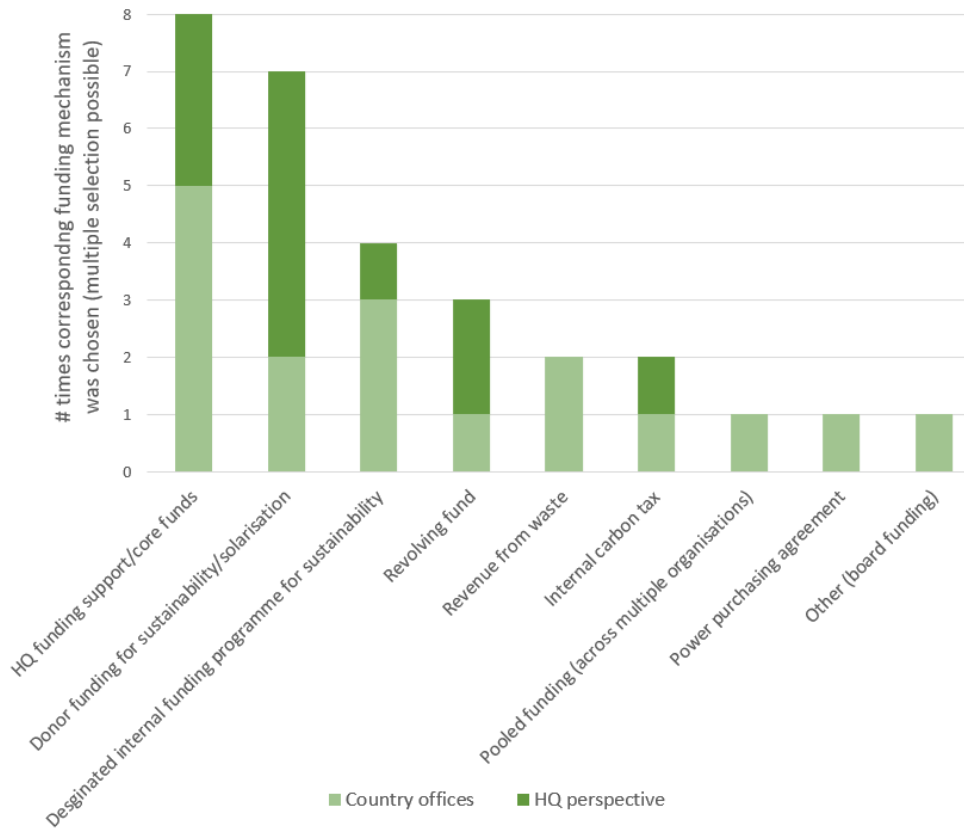


Figure 6: Ways of financing solarisation.

“We would love to include the donors more, because while the investment is ours, we are saving costs for them (by lowering the running cost).” WHH.

Based on these results, donors could expand dedicated funding windows for solarisation, as, in the words of one responded, this also saves them money (see quote). Given tighter core budgets/funding envelopes, headquarters could explore under-utilised, innovative ways to finance solarisation such as setting up an internal carbon tax⁶, or revolving funds. Field offices could consider local options to meet upfront investment needs such as power purchasing (paying for energy per month rather than upfront for solar equipment); or revenue generation through waste (e.g., auctioning off unused items). HQ could support field offices by helping them de-risk solarisation and/or bundle demand such that power purchasing is more attractive to service providers.

⁶ Donors may not allow taxes, including a carbon tax, to be included in funded projects. This can mean that a corresponding carbon tax policy needs to be donor-approved before it can be put in place and/or added to project budgets.

ANNEX

Context & additional content

Data considerations

This 3W looks at organisations which have solarised facilities in the field. It doesn't consider solarisation for affected populations, e.g., refugee camps. Following a survey and desk research, 24 organisation's solarisation efforts were considered⁷. Slightly over half are NGOs (see Figure 7), and over 60% are country offices (headquarter responses still look at field solarisation but tend to consider multiple facilities), see Figure 8. To account for country office vs. headquarter perspective, all monetary figures distinguish country offices from HQ.

Solarisation by location and facility type

Facilities solarised are mostly offices, followed by warehouses and guesthouses, see **Error! Reference source not found.**

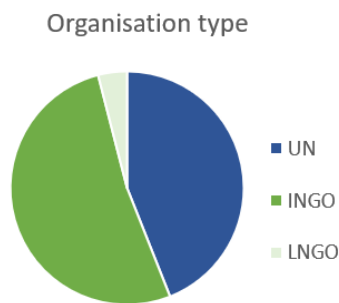


Figure 7: Organisation solarising, by type.

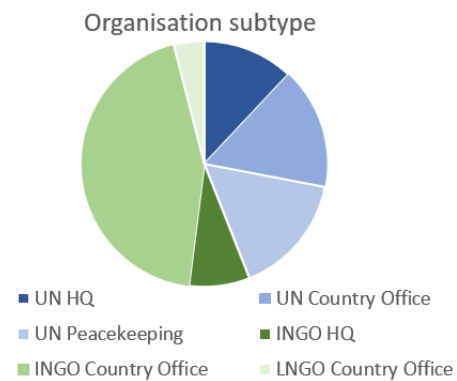


Figure 8: Organisation solarising, by subtype.

This 3W captures solarisation efforts in countries shown in Figure 9, highlighting a focus on Sub Sahara Africa. While this 3W points out where solarisation is happening, it doesn't make claims to be comprehensive but rather provides insights on trends. Additional solarisation efforts in other countries may be happening.

⁷ 16 people from 11 different organisations responded to the 3W survey. After removing duplicates and empty responses, 9 responses are counted, complemented by 15 manual data entries, leading to 24 entities overall. Not every entry has data on each point. For example, a country office may have data on upfront investment, but not on payback times. Organisations responding for different countries were counted separately for each country.

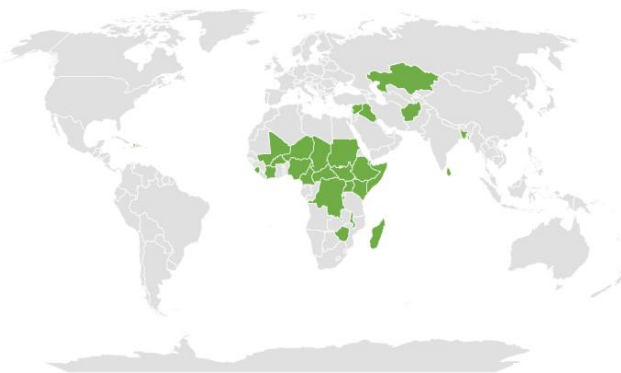


Figure 9: Solarisation by country.

Country	Organisation solarising
<i>Afghanistan</i>	DRC, UNAMA, WFP, WHH
<i>Bangladesh</i>	Concern Worldwide
<i>Burkina Faso</i>	NRC
<i>Burundi</i>	WHH
<i>Cameroon</i>	NRC
<i>Central African Republic</i>	WHH, ACF
<i>Chad</i>	ACF
<i>Democratic Republic of Congo</i>	ACF
<i>Djibouti</i>	WFP
<i>Ethiopia</i>	NRC
<i>Haiti</i>	WHH
<i>Iraq</i>	UNAMI, WHH
<i>Ivory Coast</i>	ACF
<i>Kazakhstan</i>	UNDP
<i>Kenya</i>	UNHCR, WHH, WFP
<i>Lebanon</i>	UNIFIL, NRC
<i>Madagascar</i>	ACF, WHH
<i>Malawi</i>	WHH
<i>Mali</i>	NRC, WHH
<i>Niger</i>	WHH, NRC
<i>Nigeria</i>	IRC, UNHCR, Mon Club International, DRC, Logistics Cluster
<i>Sierra Leone</i>	SCI, WHH
<i>Somalia</i>	UNHCR
<i>South Sudan</i>	NRC, IOM, WHH
<i>Sri Lanka</i>	UNICEF
<i>Sudan</i>	SCI
<i>Syria</i>	NRC, UNDOF
<i>Uganda</i>	UNHCR, DanChurchAid
<i>Zimbabwe</i>	WHH
<i>Yemen</i>	ACF

Table 1: Organisations solarising facilities, by country.

Energy savings measures

All organisations considered here apply energy savings measures, see Figure 10. These should go together with solarisation as they reduce energy need and can therefore mean smaller solarisation units are sufficient (or, in the case of a power purchasing agreement with monthly energy bills according to consumption, lower bills). Top measures are reminders to switch off lighting/equipment; optimising cooling settings; and energy efficiency equipment. While laudable, some of the more effective measures are under-utilised, especially insulation: in most facilities, heating/cooling is responsible for the largest share of power needs. And insulation is one of the most effective ways of reducing it. For example, [insulating a medical warehouse in Niamey where outside temperatures can reach up to 47 degrees Celsius meant going from using 15 AC units to 2 AC units](#). In tandem with solarisation, organisations as well as donors could look into more dedicated ways of funding field facilities insulation.

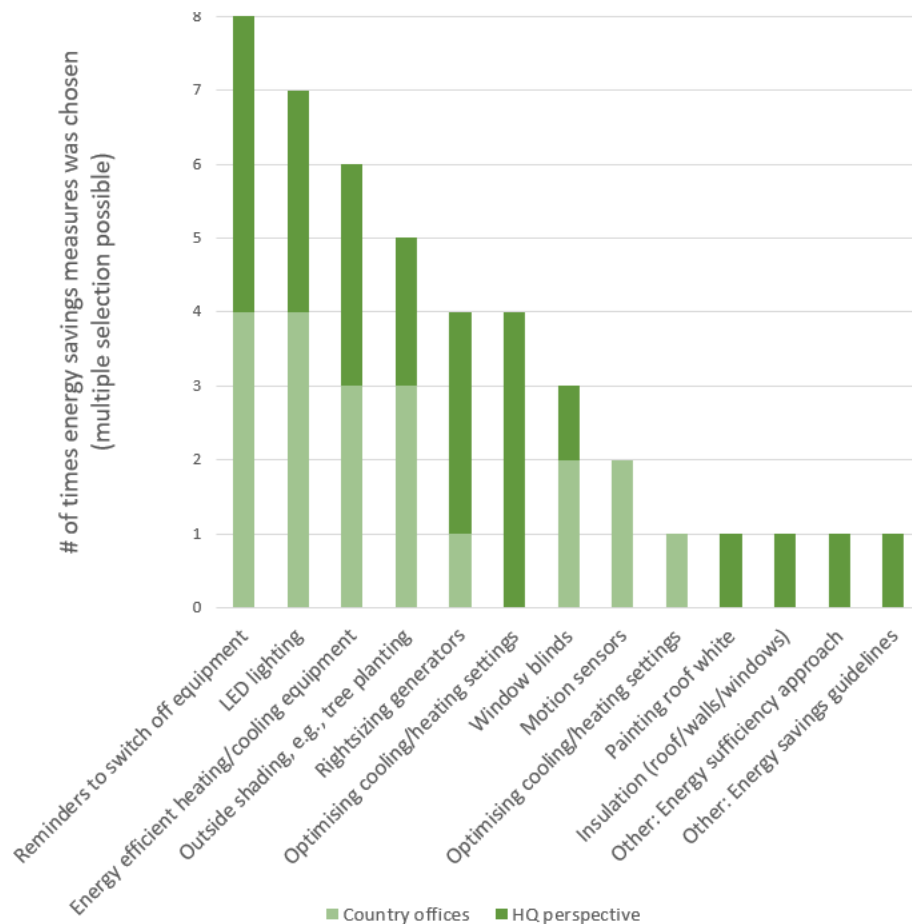


Figure 10: Energy savings measures applied.

Abbreviations, glossary, list of tables and figures

Abbreviations

3W	Who is doing what where?
ACF	Action Contre la Faim
Concern	Concern worldwide
DCA	DanChurchAid
DRC	Danish Refugee Council
HQ	Headquarters
IMC	International Medical Corps
IOM	International Organization for Migration
IRC	International Rescue Committee
kW	Kilowatt
LC	Logistics Cluster
MCI	Mon Club International
NRC	Norwegian Refugee Council
PPA	Power Purchasing Agreement
REH	Réseau Environnement Humanitaire (ENG: Humanitarian Environment Network)
ROI	Return on Investment
SSA	Sub-Sahara Africa
SCI	Save the Children
UNAMA	United Nations Assistance Mission in Afghanistan
UNAMI	United Nations Assistance Mission for Iraq
UNDOF	United Nations Disengagement Observer Force
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNIFIL	United Nations Interim Force in Lebanon
US\$	United States Dollars
WFP	World Food Programme
WHH	Welthungerhilfe
WREC Coalition	Waste management & measuring, Reverse logistics, environmentally sustainable procurement & transport, and Circular economy

Glossary

Carbon tax	An amount levied on emitted CO ₂ . For example, US\$50 is levied per ton CO ₂ emitted from road/air transport, see e.g., WFP's Decarbonisation Fund . Note: Donors may not allow taxes, including a carbon tax, to be included in funded projects. This can mean that a corresponding carbon tax policy needs to be donor-approved before it can be put in place and/or added to project budgets.
Derisking	Solarisation service providers may consider smaller solarisation projects for humanitarian agencies high-risk, especially when engaging in power purchasing, since organisations may leave the country when projects end/crises subside. Derisking can consist in payment guarantees provided e.g., by headquarters and/or bundling multiple projects.
Payback time	The time it takes to recuperate money spent to set up a new system, e.g., solar equipment.

Power Purchasing Agreement	An agreement with a solarisations service provider where the client pays for the energy ('power') generated instead of the solarisation equipment. This can be in fixed monthly instalments or according to energy consumption. For example, equipment and installation for solarising a warehouse would cost US\$ 10,000 up front. Rather than paying this sum, the warehouse owner pays for the energy consumed from the solarisation per month, for a set number of years.
Return on investment	Amount that can be recovered on initial investment or upfront costs. For example, spending US\$ 10,000 on solarisation equipment may lead to annual savings of US\$ 5,000. Therefore, the ROI per year is US\$ 5,000 and turns positive (exceeding upfront investment) in year 3.
Revolving Fund	A fund where savings generated from funded activities are reinvested. After initial set-up, the fund is therefore financially self-sustaining. For example, a fund pays for solarising an office. Savings from this solarisation thanks to no longer spending money on generator fuel are put back into the fund.

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