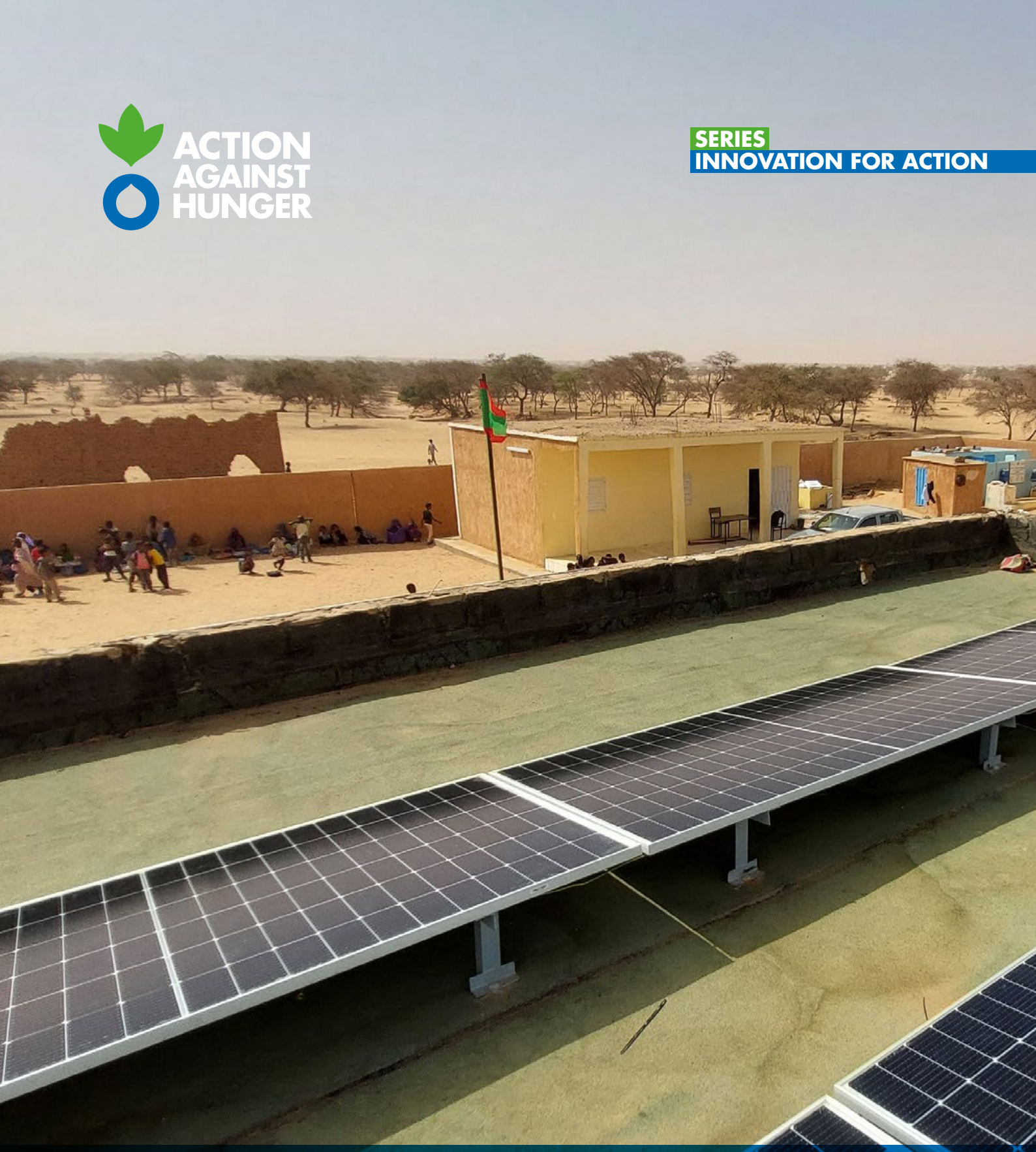
ACTION AGAINST HUNGER

SERIES
INNOVATION FOR ACTION



GHR PROJECT
GREENING HUMANITARIAN RESPONSE IN EMERGENCY CONTEXTS

THE PROBLEM: THE WIDESPREAD USE OF FOSSIL FUELS IN HUMANITARIAN RESPONSES

Energy is a basic need that must be met in all phases of humanitarian response. For a long time, energy solutions in crisis contexts have mostly relied on diesel generators, which are very damaging to the environment. This was mainly due to the ease of access to fossil fuels globally and the urgency of the situations to be addressed. According to the Global Platform for Action, humanitarian actors used 11,000 diesel generators in 2024, producing some 190,000 tonnes of CO2 per year.

Although it is present in every phase of response, the energy used to deliver humanitarian aid is an issue that has often been relegated to the background as a purely logistical matter. However, the impact it has on the environment, its detrimental impact on the fight against climate change and on communities is of paramount importance.

Why change this?

Promoting the use of renewable energy in the humanitarian sector can have a major impact on several levels. On the one hand, it reduces damage to the environment and limits overexploitation of natural resources, while empowering beneficiary communities by providing them with sustainable livelihoods. On the other, it shows the way forward, as a civil society organisation, by demonstrating that it is viable and feasible to operate and work, even in the most difficult circumstances, with clean energy.

For example, 90% of refugees today have limited, if not no access to clean, sustainable, renewable energy for the future.

IN SEARCH OF SOLUTIONS

Non-profit organisations with few resources seek to promote health and sustainability, but many programmes, especially in emergency situations, rely on fossil fuels that are costly, worsen the climate crisis and generate air pollution that harms the health of the communities where we work, as well as the health of aid workers themselves. However, anticipating and implementing renewable energy-based systems in emergency contexts such as disasters and refugee camps has been complicated for a number of reasons. These include a lack of technical capacity on the part of humanitarian teams to assess and design renewable systems in the field, as well as a widely held assumption that renewable energy is “complex” to implement.

To address this issue, Action Against Hunger, together with the acciona.org Foundation, has launched REact (Renewable Energy for Assisting Communities tool), the first free, open-access assessment and design tool that allows to estimate energy needs in humanitarian contexts and guides the decision-making process to meet those needs through solar energy.

Designed for the humanitarian sector, REact performs a rapid assessment of the energy needs of humanitarian operations and then provides a technical design for renewable energy solutions that can meet anticipated demand.

The web application integrates the necessary calculations, to avoid making the process complex, and provides users with clear guidance tailored to the specific sector(s) of work (e.g. health, education, shelter or water, sanitation and hygiene) to be measured and solarised. It also aims to be easy to understand for people who may not have a technical background in renewable energy, whether they are project managers, technical specialists from other fields (e.g. doctors, teachers) or programme managers or logistics professionals.

DIFFERENTIAL FEATURES OF REACT

UNIVERSAL

REact is designed to work anywhere, providing practical support for both emergency humanitarian deployments and development programmes. Its design allows it to automatically incorporate the technical considerations associated with locations anywhere in the world, adapting the solution to the solar irradiance levels of the site.

ANALYTICAL

REact allows to compare the economic cost between a clean and a polluting solution by calculating the initial investment cost and the payback time. Having this kind of quantitative information helps to counter the misconception that investing in solar energy is too expensive or does not pay off economically.

INTUITUOUS MANAGEMENT:

Users do not need to be technical experts or even be in a context with high internet coverage. REact enables humanitarians in the field to understand their energy demand, as well as the cost required to implement a renewable solution that meets that demand. REact is designed to bridge a key gap by providing a solar technical design for non-technical people.

FLEXIBLE

Although its main objective is to support the use of renewable energy in humanitarian operations and emergencies, REact can also be useful for development project design and planning at the community level. REact's design system can differentiate between short (less than 6 months) and long term humanitarian responses, proposing different solutions adapted to the type of emergency and its duration. For example, it can be used to design solar systems for community buildings such as schools or health centres, increase access to water through solar pumping, improve the protection of women and girls the lighting of toilets and pathways, or encourage the use of electric cookers. The tool can also be used to solarise organisations' own facilities on the ground, enabling solar design for offices, warehouses or the guesthouses of humanitarian organisations.

FREE AND OPEN ACCESS

An essential aspect of promoting the use of non-renewable energy in the humanitarian and development field. Organisations working in these areas are in great need of this innovation but, at the same time, have limited financial resources. For this reason, the fact that REact is free of charge is a differential factor and is a commitment by its promoters to contribute in a practical way to improving the sustainability of the sector's operations.

CO-DEVELOPED

The tool has been developed not only with energy and technology experts from the two promoting organisations, but also with the practical input and active collaboration of 40 international non-profit organisations and UN agencies, which has helped to ensure that REact has a robust structure and is supported by experts from different organisations.

The tool is the result of partnerships that have brought together operational legitimacy and technical expertise in the different key sectors of emergency response. React has been technically developed by the Escuela Técnica Superior de Ingenieros de Telecomunicación of the Universidad Politécnica de Madrid and the calculations and algorithms have been corroborated by the Spanish Institute of Solar Energy.

THE POTENTIAL IMPACT OF REACT

One of the advantages of REact is that it proposes a cost comparison between a fossil fuel solution (diesel generator) and a renewable solution (solar system). This comparison allows, on the one hand, to understand what the initial investment cost would be if we wanted to install a solar system, helping to fight the myth that solar systems are "too expensive". On the other hand, it allows us to identify the payback period in number of years. This helps to understand at what point it will be more profitable to have purchased a solar system compared to a renewable energy system (for example, in our pilot project in the Aghor school in Mauritania, after 3 years of use, the cost of having purchased a solar system is equal to that of the generator).

Such quantitative benchmarking promotes the incorporation of renewables into the programmes of NGOs, a sector of the economy that has been relatively slow to decarbonise, by facilitating more accurate financial planning and much more practical emissions calculations.

The use of REact can help humanitarian operations reduce costs, improve energy security (fossil fuels may not be available in some places, such as conflict zones), reduce greenhouse gas emissions and improve health, as fossil fuel generators can be highly polluting and must operate near vulnerable populations.

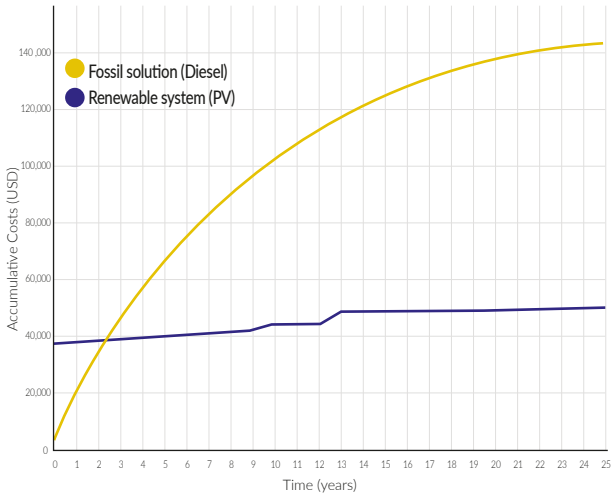
With REact, user organisations can easily accelerate their efforts to decarbonise their operations: from medical teams operating in remote areas with mobile clean energy systems replacing diesel generators, to care centres in refugee camps running on solar panels and batteries, avoiding the production of polluting emissions near sick patients, pregnant women or minors.

HOW DOES REACT WORK?

REact has **two different modules** that can be accessed together or separately: one that assesses energy needs by humanitarian sector and another that provides solar-based alternatives to meet that demand, indicates the payback time and carbon footprint, and compares the costs of fossil fuel-based and renewable energy-based solutions, m aking the process much easier and more accessible. Even a non-technical project leader can generate a renewable energy design tailored to their type of programme and location, reducing costs, emissions and the negative impact of fossil fuel use on the environment and on the health of populations.

In particular, the **energy needs assessment module** consists of an easy-to-complete questionnaire. It presents results in units of energy (kW/h), in each of the traditional sectors of humanitarian response according to the needs included (type of device and its consumption). It also includes graphs of consumption by sector and the estimated carbon footprint associated with the data included.

CUMULATIVE COST COMPARISON



Comparison of economic costs between the renewable and the polluting solution. In this particular case the investment would be recovered after 2.59 years.

HUMANITARIAN SECTORS ASSESSED IN THE FIRST MODULE

- Shelter
- Education
- WASH (water, sanitation and hygiene)
- Logistics and telecommunications
- Food security and nutrition
- Cooked
- Health
- Protection
- Livelihoods

The second **module, the solution design module,** presents technological alternatives according to the pre-estimated energy demand, such as photovoltaic systems (solar or hybrid) and stand-alone solutions. The results provided include the LCOE (cost of converting a pre-estimated energy source into electricity) of each solution compared to fossil fuel-based solutions, the carbon footprint of using more polluting solutions, the different renewable energy options, operation and maintenance recommendations for each of these options.

Up to 170 humanitarian practitioners from different organisations tested and refined the first REact prototypes through more than 30 workshops, individual meetings, small group ideation sessions and evaluations. Multiple use cases were considered, ranging from decarbonisation of community kitchens, to solarisation of public infrastructure (schools, health centres, street lighting) as well as household needs in refugee camps and host villages.

REACT IN ACTION: PILOT PROJECTS ON THE GROUND

The initiative has involved the implementation of two field tests in order to test the effectiveness and accuracy of the tool in real-life situations.

Two humanitarian contexts were selected where access to energy was scarce and where this was impeding the proper implementation of the humanitarian response.

The first context chosen was Colombia, where, a partnership with Médecins du Monde-France, two mobile solar systems were delivered, which can be transported and deployed during medical missions carried out by the organisation in the department of Chocó. In addition, the project solarised the Action Hunger office in Acandí, to

support the medical team in charge of treating migrants in transition who are about to cross dangerous Darién jungle. The main objective was to replace the polluting energy sources that the teams carried on their missions (diesel and petrol generators) with solar energy systems to cover the energy needs of the teams (lighting, charging computers and mobile phones, ventilation inside the rural health centre)

For the purchase of the equipment, the energy needs of the medical staff were first assessed through REact, including the devices used, as well as the time of use. Following the assessment, REact automatically provided the most suitable technical solution.

In the second context, Mauritania, it was decided to solarise a primary school in the village of Aghor, near the border with Mali. There is a growing refugee population in the village, living side by side with the Mauritanian host population. The intervention of Action Against Hunger and acciona.org aims to improve public infrastructure services in the village, reducing tensions between the refugee population and the host community.

THE UPTAKE APPROACH: RESEARCH AS A DRIVER OF CHANGE

Action Against Hunger's Research and Innovation team is convinced of the relevance of operational research as a means to improve the impact of our action against hunger. The aim is to promote the use of renewable energies, thus reducing the use of fossil fuels in the non-profit sector. For this reason, the project has focused on the development of a tool that can be used by all types of stakeholders, including environmental decision-makers at national, provincial and municipal levels, as well as teams from non-profit organisations and international agencies.

By generating a renewable energy measurement and management tool, the project aims to func-

Electrical installation (lighting and fans) powered by solar energy provided by the project. Aghor school, Bassikounou municipality (Mauritania).

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tion as a catalyst for transformation and aims to highlight the need to implement the use of renewable energy on a large scale, based on an application based on reliable data and with a practical, transparent and participatory perspective. We also seek to put the issue of fossil fuel use on the political and social agenda when providing humanitarian assistance in emergency areas.

Transporting portable solar equipment by river in the department of Chocó (Colombia).
©Carmen Ruiz for acciona.org

We need to join forces and capacities, building alliances that are committed to a different way of dealing with malnutrition, and with whom we can work together.

LEARN MORE

FIND OUT HOW REACT WORKS: WATCH VIDEO

NEXT STEPS AND SPACES FOR COLLABORATION

- **Share the tool with** humanitarian and development organisations that REact can help to decarbonise their humanitarian response.
- **Ensure the** continued **hosting** and support of the app in order to maintain its open and free nature.
- **Disseminate the results** of the project and disseminate the web app to the largest number of external actors, potential REact users.
- **Continue testing** the tool through case studies in different parts of the world, gathering experiences to improve the usability of REact and demonstrate that solarisation is possible, even in adverse conditions.
- **Continue the development of the tool** by collecting feedback from its users in order to incorporate improvements in the functionalities associated cost comparison, increase the number of activities that can be evaluated, the number of devices available for energy evaluation and greater flexibility for the user.
- **Promote the use of clean energy** in the humanitarian world, providing concrete and quantitative arguments (carbon footprint, comparative costs) to advocate for decarbonisation to donors and governments.
- **Position Action Against Hunger as a technical reference** in the field of energy access in humanitarian operations.

REact

Renewable Energies
for Assisting Communities Tool

Designed by:

ACTION AGAINST HUNGER

acciona.org
The Energy & Water Foundation

With the support of:

Co-funded by
European Union
Humanitarian Aid

ACTION AGAINST HUNGER

To find out more about REact:
https://react-tool.org/

You can download a digital version of this document **here**