



POWERING AHEAD

Improving how we use and account for energy
in humanitarian operations

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What is the Moving Energy Initiative?

The Moving Energy Initiative (MEI) is an international consortium, funded by UKAID, seeking to transform the way that energy is treated in the humanitarian system.

Who might use this toolkit?

This toolkit is a practical guide for humanitarian agencies that want to make energy cost savings and reduce their carbon and emissions footprint. It is part of a series of published outputs examining how energy is used in humanitarian settings. It is designed to accompany our research paper, [The Costs of Fuelling Humanitarian Aid](#), which provides insight into energy use in the humanitarian sector and demonstrates the case for change.

Our analysis reveals the sector's high dependence on diesel fuel, and explores multiple areas in which efficiency improvements, changes in agency practices or investment in renewable energy would generate significant cost savings.



In 2007 Ban Ki-moon set the ambition for all UN organizations to achieve carbon neutrality by 2020 – at the moment we are well off-track. UNHCR

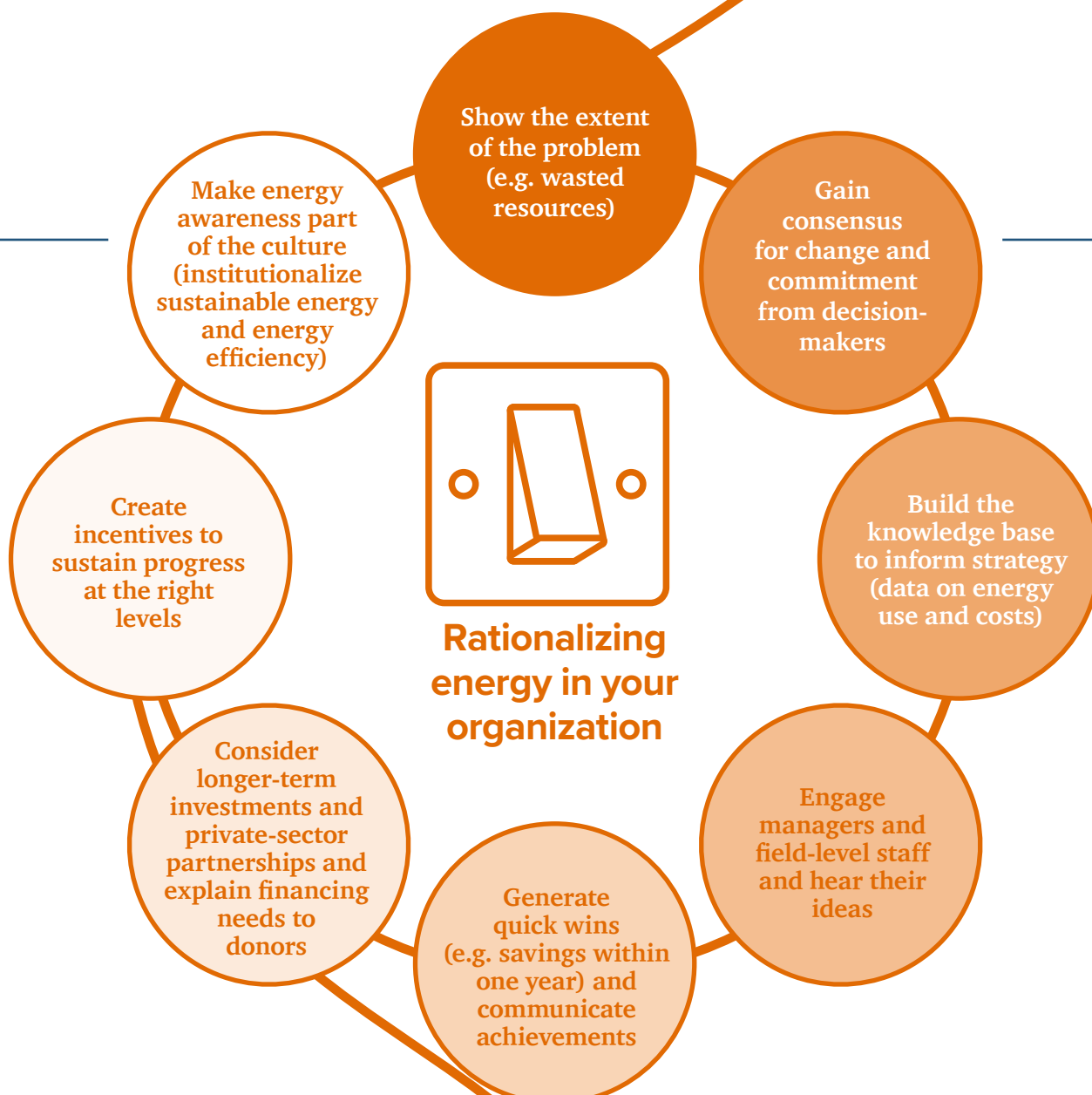
Starting the change process

The nature of emergency relief has meant that sustainability considerations have not been a priority for humanitarian operations.

This is changing.

Even where an organization's leadership wants to integrate energy into its sustainability policy, it may lack a basis for creating the right policies, embedding progressive incentives and finding the funds to implement change.

Here are some basic suggestions:



Five steps to energy awareness

As a starting point, or to make progress where change has begun but stalled, this practical toolkit talks through five steps that organizations can take, illustrated with real-life examples.



Step 1 – Capture data on energy use



Step 2 – Target quick wins in energy rationalization



Step 3 – Change behaviours and challenge ‘normal’ practice



Step 4 – Invest for long-term change, creating virtuous savings cycles



Step 5 – Access external finance and work with private energy services providers

Step 1: Capture data

The first step to rationalizing energy use is to understand how much you are consuming, what purposes you are using energy for, and how much you are paying for it.

If you don't know how much you are spending on energy, you can't make the case for devoting time, effort and money to reducing consumption.

Creating a baseline of energy consumption will take time and effort – you will need to find out who holds information about energy use, bills and fuel procurement. Where these data are not collected, your organization will need to institute appropriate reporting processes. Here are some simple ways to begin.

If your organization has operations in many countries, you could run an 'energy baseline' pilot in several countries. Ask whoever pays for energy (i.e. fuel for generators or utilities bills) to collect data over a minimum three-month period – the longer the period the better. Where fuel is received as part of your contract (without charge), make sure you collect data on volumes and uses too. Costs for deliveries of fuel (supply fees) and generator maintenance should also be collected.

? *'Do you know how much your operation spends on diesel?'*

? *'Does your organization have a team who can advise you on energy use?'*

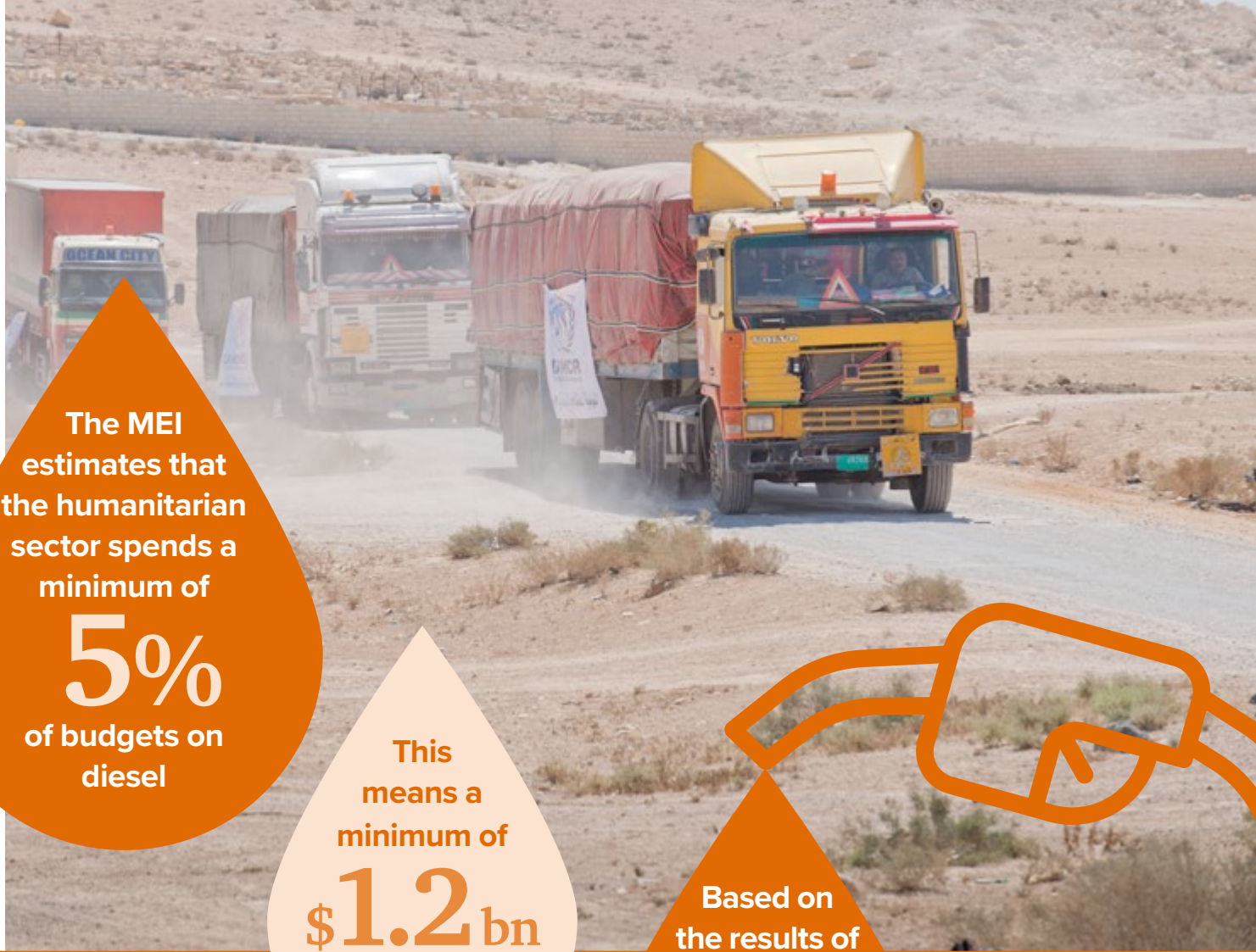


Ideally an organization should appoint in-country persons, probably in procurement and finance departments, to keep track of the data. In smaller organizations, it should be easier to centralize data on costs and use. Reporting should try to show clearly:

- What is being used and where on fuel, electricity and other energy services (in terms of kWh and litres of fuel), annual average use and any seasonal spikes. Ensure the data are benchmarked across the organization using common metrics (kWh/sq m, gallons, fuel/staff, etc.).
- How energy use relates to transportation. Information should be collected on flights taken (and CO₂ per flight), vehicle spending and miles travelled.
- The quality of fuels used in terms of milligrammes of sulphur per kilogramme of fuel – usually referred to as ppm (parts per million) – and whether tailpipe emissions conform to international standards.
- How much is spent on energy use monthly and annually (this may be the first time anyone has collected data on this).
- The operations and activities that exhibit high energy costs – e.g. water pumping, refrigeration, air-conditioning, staff journeys. Staff on the ground will be able to help identify inefficiencies.
- Which actions have been taken in order to evaluate success and inform improvements as required.

Some good ways to capture data

1. Take inspiration or advice from MSF Operational Centre in Brussels, which mapped its own energy use between June and December 2017 and developed an [Energy Vision](#) [↗](#), and from the World Food Programme (WFP), which attempted to roll out a [‘Green Kit’](#) [↗](#) for country offices to monitor its own energy use.
2. If you are a UN organization, take advantage of an [Environmental Peer Review](#) [↗](#) of your organization through Sustainable UN’s Environment Management Group.
3. Use sensors to get accurate and ongoing measurements. Coventry University in the UK is trialling the use of sensor technologies in humanitarian settings to help humanitarian agencies become more aware of what they are using (and spending). [Check out its work and findings online here](#) [↗](#)




The MEI estimates that the humanitarian sector spends a minimum of **5%** of budgets on diesel

This means a minimum of **\$1.2 bn** every year

Based on the results of pilots, the MEI estimates that **\$517m** in operating costs could be saved each year

Step 2: Target quick wins

Humanitarian agencies are usually under pressure to deliver ‘quick wins’ and to show the immediate value of an intervention. Given this, we recommend using the data you have captured to identify areas where you can create instant impact and a quick return on investment.

 *Where is the ‘quickest win’ in your operation?*

 *How much would you save?*

Mapping exercise

While there is a strong moral imperative for energy change, institutional decision-makers must be first persuaded of the financial or strategic basis for devoting time and resources to energy management. With this in mind, your mapping exercise should consider:

1. The places your organization works. Are there areas where the cost of fuel is exceptionally high – for example, refugee camps located in remote areas and large office buildings in countries that have undergone electricity tariff reforms?
2. An audit of one or more specific settings. This could provide a detailed breakdown of energy use in a building or camp, for example, with a report on costs and the estimated costs and payback periods for energy-saving investments. Then invest in those measures and solutions that will pay off within your current budget window.
3. Other benefits from saving energy. In addition to lowering fuel costs, energy-saving projects will reduce maintenance costs, staff time spent on maintenance and procurement, soot and air quality impacts, noise from generators, and logistical expenses associated with shipping fuel. These reductions are more difficult to quantify, but can help make the case for investing in energy efficiency.
4. Other organizations in your area that are focusing on energy use. Can your organization collaborate to achieve higher impact? Or could you adapt their learnings to your organization?
5. How you can demonstrate and publicize impact. This can highlight the efficiency of your work as well as drawing attention to campaigns.



A recent study in Nyarugusu refugee camp in Tanzania showed 60% of diesel use was going on water pumping, offering a clear possibility for savings.

Two examples of what a ‘quick win’ might look like

1. Large agencies – and donors – might be able to replicate what has been done in other large commercial or government buildings. Between 2013 and 2016, USAID’s Energy Sector Capacity Building programme found that some government ministries in Jordan (with similar-sized buildings to the larger humanitarian organizations) could pay back energy efficiency investments in eight months; and solar PV systems in four years. Jordan’s Ministry of Information and Communication Technology adopted the recommendations and reduced its electricity bill by 20% in the first year – a saving of over \$55,000.
2. For new water-pumping stations, solar solutions should always be considered. The [Solar and Water Initiative](#) of the International Organization for Migration and Oxfam has found that solar water-pumping solutions can often deliver huge savings to humanitarian agencies. A recent study in Uganda showed an average break-even point for the solar investment of only 1.1 years, and an average reduction in lifetime expenses of 66% compared with equivalent diesel-powered solutions.



Step 3: Change behaviours and challenge 'normal' practice



Most organizations do not have a policy for training staff on energy consumption. Yet the inefficiencies are currently such that the potential for savings will be obvious.

One former energy efficiency expert recalled calculating that a field office he visited would have saved money on overall yearly expenditure by employing someone to 'go around closing doors and turning off air-conditioners'. Using the examples in this toolkit to increase energy awareness and challenge normal practice will bring benefits to your organization.

WFP Energy Efficiency Survey results

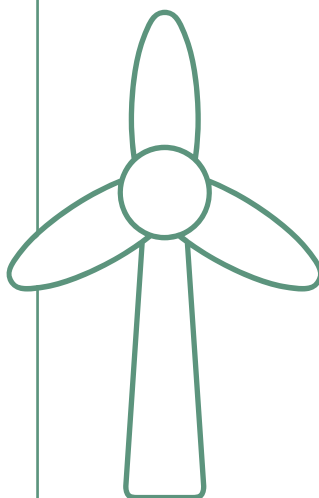
Save **5–8%** on energy bills

WFP estimates that agencies can reduce their energy expenditure by around up to 8% simply by changing staff behaviour, for example by turning off computers and air-conditioners.



30%
reduction
in costs

Making existing equipment more efficient, for example replacing light bulbs and air-conditioners, could save up to 30% on current energy costs.

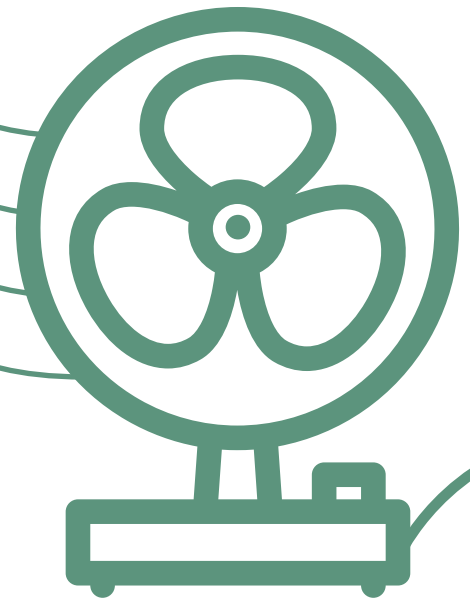


80%
lower annual
expenditure

And 80% could be saved on yearly fuel expenditure by introducing renewables.

\$150,000 per year...

...spent on-air conditioning



One organization in Amman, Jordan, spends over \$150,000 a year on air-conditioning. That's over 32% of total energy spend in the building.

On a day-to-day level, behaviour change can challenge normal practices. Simply turning off lights can be supported by installing timers to ensure equipment is turned off automatically. Awareness training, messages of support and leadership by example from senior managers will encourage staff to take up the initiative – over a short period energy users will not even realize they are reducing consumption. Incentives for staff could be created in several ways:

- Enabling easy channels of communication for field-level staff could solicit suggestions on improving energy use.
- Once an organization has a baseline for energy use, a scheme with local partners could enable the country office to redistribute some of the savings each year to a good cause chosen by staff.
- Appointing an energy manager for each country operation could help larger organizations – his or her salary could be paid from some of the savings made.




Each person in an organization can play a part, and the organization itself can make positive moves to show commitment to becoming energy aware. The table on the following pages has been created to show how energy reduction can be achieved by a variety of stakeholders – from those of us who work in the field to those who work in headquarters managing the organization.



How could you encourage your colleagues to change their behaviour to save energy?



Who could be your main allies?

	 As a user of energy	 As a provider of energy solutions	 As a buyer of energy
Who you are	<p>You are someone who uses energy or controls the use of energy for others (for example, someone in logistics or office services). You may want to do something about energy, but are not sure what can be done or feel there is no time or money available for this.</p> <p>Field officers, advisers</p>	<p>You are a person or a team tasked with understanding and delivering on energy solutions – this could be as part of the organization you work for or as a supplier.</p> <p>Understanding and responding to energy needs is a part of your job. You probably know how to do certain things better, but feel constrained by organizational rules and precedent.</p> <p>Environment advisers, energy advisers, logistics advisers</p>	<p>You are an organization that buys energy for delivering into its operation. You pay for energy in the form of diesel for cars and generators, or electricity for servicing offices and operations. Relative to your overall budget, you probably think energy soaks up quite a sum.</p> <p>Management and decision-makers</p>
Energy in your area	<ul style="list-style-type: none"> • Office equipment • Lighting • Air-conditioning • Fuel for cars • Domestic appliances (for those living away from home) 	<ul style="list-style-type: none"> • Generator fuel • Fuel for vehicles • Purchasing equipment that uses energy • Design of installations/ camps/office accommodation • Providing fuel to beneficiaries (cooking, heating and lighting) • Providing fuel to partner organizations 	<ul style="list-style-type: none"> • Organizational electricity bills • Fuel bills for vehicles • Flights
What you can do	<p>Office equipment</p> <ul style="list-style-type: none"> • Use the power management features of your computer to increase efficiency, including reducing the time until 'sleep' mode • Turn off equipment when leaving the office for the day • Request A+ rated equipment. Ask for wall-mounted timers or systems to turn off equipment when not in use • If you can, use cloud or centralized computing instead of relying on servers at all sites or field offices. This may need to be balanced against the availability of consistent and secure internet access. <p>Domestic appliances</p> <ul style="list-style-type: none"> • Ensure that they are turned off when not in use 	<p>Generators and generator fuel</p> <ul style="list-style-type: none"> • Ensure an adequate maintenance regime • Monitor fuel consumption • Examine whether renewables (hybrid) systems could save you money 	<p>Electricity/energy bills</p> <ul style="list-style-type: none"> • Create organization-wide monitoring system • Review use against cost • Develop working policy for energy rationalization • Consider the case for employment of maintenance engineers/a company to service and maximize efficiency of generators
		-	-



As a user of energy



As a provider of energy solutions



As a buyer of energy

What you can do

Lighting

- Turn lights off when you leave the office
- Ask for LED desk lamps

Vehicles and vehicle fuel

- Monitor fuel consumption and fit speed limiters
- Ensure a robust maintenance regime
- Develop ‘driver awareness’ training
- Consider trialling fleet-sharing schemes with other agencies. The simplest way to begin would be by encouraging staff to pool their journeys.

Fuel bills – vehicle use

- Support journey-sharing schemes
- Review vehicle procurement and make sure that fuel efficiency specifications for the vehicle types are appropriate for the terrain

Air conditioning

- Turn air-conditioning up (less cold). In Dubai, for example, government buildings are required to be no lower than 24°C during the day.
- Fix timers to turn off when not in use
- Ensure doors and windows are closed if using air-conditioning

Equipment

- Show the business case for A and A+ rated equipment
- Install wall-mounted timers to turn on/off when not in use
- Develop ‘office user awareness’ training

Flights

- Review flight use – understand how air travel can be minimized
- Create video conferencing facilities

Fuel for cars

- Stop idling
- Ask for speed limiters to be fitted
- Ensure cars are maintained properly

Design of installations/camps/office accommodation

- See if buildings can be better insulated to keep cooler in summer and warmer in winter, avoiding energy use.
- Investigate expected energy consumption of accommodation/office units – consider solar water heating and insulation as well as ‘passive design strategies’ (e.g. shading devices, tree-planting, and cooling roofs)
- Investigate use of management systems to control equipment use
- Review use of air-conditioners and install limiters

Step 4: Invest for long-term change

Creating a robust organization-wide energy policy in humanitarian agencies will require high-level support as well as evidence of short-term success.

But the humanitarian system needs to restructure its energy response in order to save money and ensure that it is truly ‘doing no harm’. A thorough change process is complex and requires evolution along the entire decision-making chain.

In the long term, agencies need to reform the way budgets are structured so that individual country offices are empowered and incentivized to use their own resources to make needed investments. Nonetheless, energy champions within humanitarian organizations will play a huge role in driving long-term change processes. Some measures of long-term success will include the below:

Decision-making authority	Who has the authority to make energy decisions at: i. policy and target-setting level? ii. procurement and budgeting level? iii. country operations level? iv. camp management level?	
Information	As someone with the power to act, can I access the data needed to inform decisions?	Is there sufficient data to understand the problem? Who can advise me on the appropriate solutions?
Empowerment and incentives	Do I have the finances to implement the solutions that I have identified? Can savings on energy costs help me hit my performance targets? Are there ways that my area can benefit from making savings? And what will motivate all staff to play their part in improving efficiency?	
Access to funds	Where an organization is not able to fund long-term energy saving investments directly, what are the opportunities to access funding or financing or enter into a partnership with a private-sector provider?	

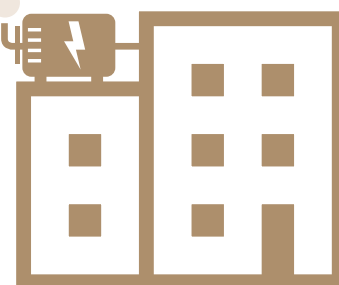
Some examples of cost savings generated by switching away from diesel

1. The International Rescue Committee (IRC) has worked with Kube Energy and Powergen as part of a Moving Energy Initiative project to solarize health clinics. The newly completed work has reduced total energy costs from \$2,334 per month to \$500 per month. Overall payback (had the project been undertaken at cost to IRC) would have been just under five years.
2. In 2016 WFP installed a hybrid wind/solar/diesel-powered system to power its warehouse in Herat, Afghanistan. \$528,948 was needed to install the new hybrid system, but ongoing savings of \$57,391 per year mean that WFP's investment will be paid back in 5.2 years. Over its lifetime (15 years), the hybrid power system will generate an estimated saving of nearly \$0.87 million for WFP.

Ditching diesel

It is almost always easiest to follow what has been done before. In the field of energy, this normally means relying on diesel generators for electricity generation. These generators are used to power water pumps, offices, temperature-controlled storage of food and equipment in warehouses, and medical and educational facilities. Switching away from diesel will be an organizational decision. Diesel is likely to remain a highly useful hybrid or back-up fuel but research within the Moving Energy Initiative has demonstrated extensive opportunities for saving money by moving away from excessive diesel use.

**\$6.7
million**



The total spending on diesel and petrol for the seven agencies we talked to in Kenya was over \$6.7 million per year

Creating new internal systems

Staff working on energy will need to constantly justify their own roles as agencies increasingly look for ways to cut costs and improve efficiency. But the abundant potential for cost savings on existing energy use means that internal systems can be designed to self-finance.

Some examples of good practice

1. Through WFP's [Energy Efficiency Programme \(EEP\)](#), a carbon levy was imposed on WFP's vehicle fleet. Countries that purchase new vehicles pay a tax that accrues to a central pot with the EEP team. The money in this pot is then distributed to country offices, sometimes in grant form, and sometimes in the form of a loan. Most often the pot covers the full cost of energy surveys and up to 75% of the capital costs for implementing energy efficiency and/or fuel-switching projects (including renewable energy installations), after meeting basic criteria.

2. [UNICEF's 'Fleet Sharing – Proof of Concept' \(POC\)](#) won the Fleet Forum 'Best Transport Achievement Award' in June 2017 by showing that fleet sharing in humanitarian settings can achieve large cost savings, improvements in driving behaviour, and reductions in the overall number of vehicles required in the fleet. The payback period on this pilot was realized in a matter of months, and UNICEF estimates that rolling out this system throughout the organization could cut costs by as much as \$4 million per year. Other organizations can also set targets and timelines for improving fleet efficiency and investigating how journeys can be reduced.

Recognitions such as an annual prize for greenest building or most improved operation in energy efficiency could help. Channels of communication to receive ideas from field office staff on how to improve efficiencies (not necessarily just related to energy) and energy sustainability could open up opportunities for locally appropriate solutions.



From the \$2.8 million invested in greening projects by the WFP EEP team, a reduction of approximately 1.6% in energy use for the organization has been achieved. Over 40 energy efficiency projects have been implemented, in 13 countries. These energy efficiency projects will see an annual reduction in greenhouse gas emissions of around 2,600 tonnes CO₂e, and annual cost savings of \$1.35 million – equivalent to providing school meals to 14,839 students for a year.

Reduction in fleet size of **11%**

Avoid 'locking out' sustainable energy solutions

There is increasing awareness that we need to be better at integrating energy and environmental concerns from the outset of a humanitarian emergency. Doing so would reduce the risks of unintended consequences (such as widespread deforestation), and highlight potential areas of vulnerability (for example, damage likely to arise from the monsoon season).



UNHCR's move to a centralized model of fleet management in its 2014–18 Internal Leasing Programme (ILP) has demonstrated a number of concrete improvements: notably reducing fleet size by 11%; reducing fleet age by 21%; reducing procurement costs by 21%, thus saving \$5 million; and reducing variation among the fleets by 34%.

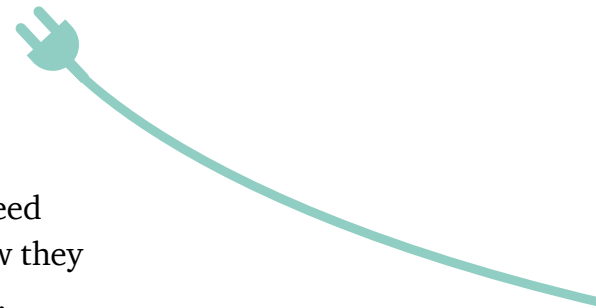
Source: Kunz, N. et al. (2015) 'Centralized vehicle leasing in humanitarian fleet management: the UNHCR case', *Journal of Humanitarian Logistics and Supply Chain Management*, 5 (3), 387–404

Using assessment tools

There are a number of assessment tools which include environmental issues. A summary of these (and how to use them) can be found online [here](#) [↗](#).

1. The Environmental Humanitarian Action (EHA) Working Group is developing EHA Connect – an online toolkit that will map environmental assessment and data-sharing tools and mechanisms, with a focus on preparedness, sudden onset and protracted crises. The framework will provide an easily accessible guide to 'what you can use', and where and when it will be most appropriate. You can read more about the framework [here](#) [↗](#).
2. Over the last 18 months, the Moving Energy Initiative has been working with the Joint Environmental Unit of the United Nations **Office for the Coordination of Humanitarian Affairs** (OCHA) and the **United Nations Environment Programme** (UNEP) to ensure that energy concerns are integrated into the updated [NEAT+ tool](#) [↗](#) for rapid environmental assessments. The tool is currently being tested by UNHCR in Zambia, in the Mantapala settlement near the border with the Democratic Republic of the Congo, and will be available soon.
3. Scene Connect and Coventry University are developing a tool for refugee camp managers that would help them to understand the potential benefits of switching to renewable energy sources. The tool will be available in summer 2019 and will be publicized online [here](#) [↗](#).

Step 5: Access external finance and work with private energy services providers



Talking money


Donors respond to calls from the humanitarian sector; they need to hear that energy is a priority area for improvement and how they can assist. There are opportunities for blending humanitarian, development and private-sector financing, but agencies need to:

- Tell donors and use the data they have gathered to show how important transition to sustainable energy and efficiency is for their organization.
- Strengthen their case by showing how energy investment can improve refugee conditions, contribute to host-country response plans and provide jobs.
- Be open to conversations about the use of guarantees or soft capital to de-risk investments or service contracts with private providers (rather than just providing funding).

Figuring out new contractual arrangements



Energy is not a core competence in the humanitarian system. This means that agencies will often need to form partnerships in order to effect change.

Rather than continuing to work on energy projects in a disaggregated way, humanitarian agencies need to work out the best way of transferring the accountability of ownership to private providers so that the partner company is paid for the performance of the energy asset over time rather than for its delivery. In this way, companies would not have to be asked or re-hired to maintain equipment – doing so would instead be in their own interests.

Table 6 in our accompanying paper on [The Costs of Fuelling Humanitarian Aid](#)  shows more details about the types of ownership model that are possible. But agencies also need to articulate what they want from private-sector providers, and understand how partnership arrangements can be structured, in order to ensure a win-win solution.




Two tools you can use to develop new partnerships

1. In 2017, the Moving Energy Initiative (MEI) completed an evaluation of the feasibility of using private-sector ‘contract mechanisms’, particularly those relating to public–private partnerships, to provide a mini-grid for the Kalobeyei settlement in northern Kenya. In the MEI’s assessment, a solar/diesel hybrid mini-grid solution would require more capital than a diesel solution, but the reduction in operational costs indicated means that the payback period would be only four years. After this period, there would be significantly reduced costs for UNHCR. Such a solution would improve electricity-supply resilience and reliability, and also allow flexibility in adapting the future supply according to fluctuating population. Read more [here](#) .
2. The MEI and Kube Energy have collaborated on a short guide for humanitarian organizations that want to transition to solar power. The guide is geared towards international organizations working in humanitarian settings that don’t have access to reliable grid electricity. The goal is to explain why organizations should make the transition; walk them through four different pathways, explaining the pros and cons of each; present illustrative costs of each pathway for a real-world scenario; and detail the steps for pursuing each option. It is available online [here](#) .



This toolkit is developed based on research presented in [The Costs of Fuelling Humanitarian Aid](#) .

All the resources of the Moving Energy Initiative are available online at movingenergy.earth .

The NEAT+ tool for rapid environmental assessment that we have developed with the joint environment unit of OCHA and UNEP is available online at www.eecentre.org/assessments/neat.html .

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