Session 2 Track B: Skills and Data

13:30-15:00 CAT
Room B
**NORCAP Green Shift Project 2018 - 2022:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # of supported missions (2018 - 2022)</td>
<td>59 missions</td>
</tr>
<tr>
<td>Total # of Deployed Energy Experts (2018 - 2022)</td>
<td>40 experts</td>
</tr>
<tr>
<td>% of Male Vs % of female in deployed missions (2018 - 2022)</td>
<td>63%:37%</td>
</tr>
<tr>
<td>Partner agencies</td>
<td>8</td>
</tr>
<tr>
<td>Partners hosting energy experts (highest to lowest)</td>
<td>UNHCR, WFP, IOM, FAO, GPA, NRC, UNICEF, UN Habitat</td>
</tr>
</tbody>
</table>

**Partners:**

- UNHCR 32%
- WFP 23%
- IOM 9%
- GPA 15%
- NRC 6%
- FAO 9%
- UNICEF 3%
- UN Habitat 3%

**Donors:**

Norad
European Union Civil Protection and Humanitarian Aid
Sida
UN

**Expansion of NORCAP Project since 2018:**

- 2018
- 2019
- 2020+
2022 All Green Shift Missions – 29 Missions

AFRICA

Senegal - Regional
Niger - Country
Nigeria - Country
South Africa - Regional

EYE UROPE

Switzerland and Rome, Ukraine - Global

MIDDLE East

Jordan - Regional

Regional:

Egypt
Djibouti
South Sudan
Uganda
Kenya - Country/Regional
Tanzania
Burundi
Zambia
Madagascar
Moving the sector

The roster contains expertise in different thematic:

- Solar Technology: Electrification, lighting
- Biogas production
- Food Security and Agriculture
- Cooking solutions; stoves and fuel
- Reforestation
- Environmental protection
- Information management and data monitoring
- Energy Finance
- Coordination and Advocacy
- Capacity building and training
- Site Management and planning

Monday, 30 May 2022
Skills needed to develop expertise of experts:

• Humanitarian Context Principles:
  • The majority of energy experts come from development and private sector
  • Support to guide through new place; Partners to provide needed tools, clarify operations procedures (i.e. logistics) from the start of the mission and critical considerations

• Understanding the partners needs:
  • Context analysis and induction
  • Building strategies and plans

• Fundraising and grants management:
  • Experts role in bringing energy related funding

• Blended Finance
  • Consider new way of covering energy projects

• E-Waste management

• Environmental Protection

Anaïs Matthey, Junior Energy Expert, deployed to IOM, in Geneva, Switzerland, Anaïs in a mission to Mozambique 2022
### LOCATION
- Focus on Africa and Head Quarters in Europe
- Piloting with NRC to work in Middle East

### END USERS
- NORCAP supports vulnerable populations through its partners. The project’s primary services/direct target group users are NORCAP’s partners (currently UN agencies and INGOs).
- The end-users in vulnerable populations are the indirect target groups served by NORCAP's partners.
- NORCAP supports different humanitarian settlements; camps, and urban.
- NORCAP supports direct service to end-users, facilities and operations of organisations.

### AREA OF ENERGY INTERVENTION
**NORCAP Green Shift is running below projects:**  
- Green Shift Experts deployment: technical assistance  
- Female Accelerator: technical assistance and capacity building  
- Sustainable Settlements: coordination and technical assistance  

**Key are of Focus:** Access to Energy, Greening the supply chain, Global coordination

### FINANCING MECHANISM
- Grant-based
- Looking to develop high scale national level blended finance approach

### KEY CHALLENGES & LESSONS LEARNED
- Energy is not prioritized within partner strategies or plans
- Willingness to share information and data
- Partners willingness to work together within a similar geographic location
- Lack of energy expertise; relying on short term deployment
- Lack of national policies and regulations on energy
- Clear modality in working with the private sector
- Lack of Government delivering energy assistance besides, including IDPs and Refugees, within national plans

### LOOKING FORWARD
- Join forces to overcome challenges and avoid duplicating efforts.
- Develop strategies to mainstream energy within operations and programmes.
- Invest in building capacities and training.
- Adopt new financing schemes and procedures to bring private investment and collaborations.
"Delivering clean energy to displaced populations"

Won the Energy Transitions category at the tve (Television for the Environment) Global Sustainability Film Awards 2021!
Knowledge Products to benefit the whole sector:

- **Blended Finance Solutions for Clean Energy in Humanitarian and Displacement Settings**
- **Electronic Waste Management for Off-grid Solar Solutions in Displacement Settings**
- **Urban transitions: clean energy in urban recovery**

Reports Launching Event on January 2022
DTM Energy Module

Session 2B: Skills and Data
Anaïs Matthey-Junod (NORCAP Energy expert deployed to IOM HQ)
What is the IOM Displacement Tracking Matrix (DTM)?

- Data collection methodology: Key informant interviews and observations
- Level of assessment: Location

https://dtm.iom.int/
The DTM Energy Field Companion – Information needs

- Field Companion for Energy: a repository of standardized questions and answers (excel/PDF)
- Aligned with ESMAP MTF and GPA key indicators as much as possible
- DTM selects information needs based on context and partners request for data
- External materials for partners
  - E.g. FAQ Infosheet on DTM for Energy and DTM MSLA Analysis Framework for Energy
- Training materials for DTM enumerators and staff

https://displacement.iom.int/dtm-partners-toolkit/energy-0
The pilots: Mozambique and Nigeria reports

**Mozambique**
- April 2021
- Region: Northern Mozambique
- 26 locations
- Number of IDPs: 91,310 IDPs (23,335 HHs)
- 13 energy-related indicators

**Nigeria**
- July 2021
- Number of IDPs: 91,310 IDPs (23,335 HHs)
- 15 energy-related indicators

**North East Geopolitical Zone**
- 2,379 locations
- Number of IDPs: 2,182,613 IDPs (444,781 HHs)

**North Central and North West Geopolitical Zone**
- 1,604 locations
- Number of IDPs: 833,006 IDPs (134,908 HHs)

HH: household
The pilots: Mozambique – follow up in MSLA

- Energy data collected as part of the MSLA in the Central Provinces of Mozambique were used to inform site selection for our Innovation Norway-funded energy access project in Sofala Province.

- DTM enumerators were trained to conduct household-level energy surveys for the project.
The pilots: South Sudan and Niger

**South Sudan**
- September 2021
- 10 States
- **2,606 locations**
- 1,705,584 IDPs (313,464 HHs) and **1,506,783 returnees** (292,178 HHs)
- 9 energy-related indicators

**Niger**
- December 2021
- 4 regions
- 307 locations
- +300,000 IDPs
- 9 energy-related indicators
What we learnt and next steps

Key achievements

- With 4 pilots in 2021, DTM has collected energy-related data in
  - +6,600 locations
  - Representing 4.7 million IDPs and 1.5 million returnees (South Sudan)
- The pilots have helped raised internal and external interest to include energy in MSLA exercises
- DTM has demonstrated the capacity to serve a wide range of partners with energy access data at the location level and can play a role in capturing a baseline for SDG7 in displacement settings

Learnings

- Thanks to its wide network of enumerators, DTM enumerators can conduct different types of assessments (key informant interviews, observations, household level surveys) if correctly trained and if resources allow
- Data analysis and report writing requires expertise and resources

Future improvements

- Reinforcing training (training of the trainers) as it directly affects data quality and consistency
- Datasets could be available publicly* beyond the DTM website, reliefweb and HDX to simplify sharing/notifying of new available data
- Encourage partners to make use of the data and provide feedback, based on information needs!
Thank you for your attention!

For more information, please contact greening@iom.int
Links and complementary information

• https://dtm.iom.int/
• https://dtm.iom.int/reports/nigeria-%E2%80%94-multi-sectoral-location-assessment-energy-access
• https://displacement.iom.int/dtm-partners-toolkit/field-companion-excel
• https://displacement.iom.int/dtm-partners-toolkit/energy-0
• https://displacement.iom.int/dtm-partners-toolkit/guide/dtm-energy
Humanitarian Energy Knowledge Sharing Tools

Ranisha Basnet, Energypedia
Humanitarian Energy Knowledge Hub
This hub is a one-stop destination for anyone interested in the humanitarian energy nexus. It consolidates, manages and links the latest information and knowledge from the sector. This hub is also a living knowledge product and is continuously updated.
Humanitarian Energy Knowledge Sharing Tools

Private Sector Stakeholder Database
Database of private sector actors who are active in the humanitarian energy space. This database provides a list of companies in an easy and structured way. The companies can also easily create a profile and share their work.

Invitation to all private sector suppliers to fill in your product and service information to be featured in the database on Energypedia.
Humanitarian Energy Knowledge Sharing Tools

Humanitarian Energy Video Library
This library includes short video presentations on topics related to humanitarian-energy nexus and aims to promote knowledge exchange and sharing among humanitarian and energy actors.

Partners are invited to add in their webinars to the library by emailing energy@unitar.org
Discussion and Audience Q&A
Data for needs identification, project design and business model development in displacement settings

Learnings from the World Bank-funded projects “Energy access for host communities and Forcibly Displaced People in the Sahel and Lake Chad Basin”
Energy in displacement settings in the Sahel: background

• 3.5+ million people fled across the Region (Burkina Faso, Chad, Mali, Mauritania, Niger) since 2011: within countries (IDP) and across borders (refugees).

• 26% electrification rate 26% : 64 million+ people in the Region live without electricity.

• Nascent private off-grid sectors: cannot absorb the existing demand in the off-grid rural areas (electrification rates under 15%).

• Main/national grids: not covering camps or IDP settlements in urban settings.

• Few projects and policies addressing FDPs: integrated electricity plans do not take FDP into consideration.

• Linkages Energy & Humanitarian Space: energy as a means of achieving protection and well-being of displaced-affected communities.

Need to engage the private sector to enhance the energy access opportunities of FDP & develop energy solutions: flexible & effective while addressing the increased complexity of the humanitarian context.
Project objectives and scope

- Conduct an assessment of electricity access to better understand demand and supply and identify market barriers, key market players and support required to promote the growth of basic electricity services.

- Identify options for fast delivery mechanisms and preparing investment operations on electricity access displacement-affected communities across the Sahel and Lake Chad Basin.

1. Energy Access in displacement settings
   - Contextualise forced displacement and energy access situation in the Sahel and characterize the energy needs of displacement-affected communities.

2. Energy interventions
   - Identify the most suitable energy interventions to address the identified energy needs of displaced populations.

3. Market characterization
   - Present the size of the potential market to reach and analyse the off-grid market landscape in the Sahel countries, including main market barriers.

4. Implementation
   - Identification of business models and delivery mechanisms that are needed to carry out the energy interventions within the current socio-economic and market context.

5. Roadmap
   - Guide the implementation milestones to reach sustainable electrification of displaced-affected communities.
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5. Roadmap
   Guide the implementation milestones to reach sustainable electrification of displaced-affected communities.
Energy needs of displacement-affected communities: methodology

- Identify key similarities, differences, and interwoven relationships.
- Understand the different energy needs distinguishing by end-user categories, end-user types, settings, and sex.
- Identify empirical proof for main socio-economic and energy trends.
- Build up an energy profile for each setting.
- Identify the inputs for the Least-Cost of Electrification analysis.
Energy needs of displacement-affected communities: key findings

- Vulnerability of IDP households in urban settings: lower access to basic services and left behind by humanitarian aid.
- Limited access to expensive but low-quality energy products: alternative coping mechanisms.
- Key role of humanitarian actors: essential means of livelihood and access to SAS systems.
- Limited access to traditional financial services.
- Health centers and schools: energy infrastructure under-maintained, assets inefficiently used and a lack of clarity of responsibilities.
- Business generation is an incentive for both IDP and refugees to remain in the settings.
Energy delivery in displacement settings: barriers

• There are a range of barriers hindering the delivery of effective business models.

• A combination of approaches are needed to overcome the various challenges.

• A flexible, adaptable and context specific range of measures and delivery mechanisms are needed.

• Demand and supply side subsidies are crucial for all approaches.

These factors play out differently across end-user types – refugee camps, urban and rural settings.
## Energy delivery in displacement settings: business models & delivery mechanisms

### Example: mini-grids

- **PPP Energy Service Company (ESCO) model**: mini-grid assets are owned and financed by the Government; private company installs and, or operates them.
- **PPP model-split asset with grant**: the Government finances and/or owns the distribution network; the private operator finances, builds, owns the generation assets, and operates the entire mini-grid.
  - Humanitarian agency as service provider.
  - Private developer as service provider.

### Camps in high-risk areas, rural settings

<table>
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<tr>
<th>PPP-ESCO</th>
<th>Strategy at regulatory and contract level in case of grid extension</th>
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<tbody>
<tr>
<td></td>
<td>De-risking mechanisms</td>
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<td>Partnerships humanitarian &amp; development actors</td>
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<td></td>
<td>CAPEX and OPEX-based subsides</td>
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</table>

### Camps in low-risk areas, urban settings

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<th>PPP Split-asset with grant</th>
<th>Strategy at regulatory and contract level in case of grid extension</th>
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<td>CAPEX and OPEX-based subsides</td>
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<td>Tailored PPA/leasing templates</td>
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</table>
The number of forcibly displaced people has increased by 400% during the last 3 years and the number of people on the brink of starvation has risen almost tenfold.

The complex insecurity context and the climate challenges need a combination of innovative energy business models, financing mechanisms, and implementation strategies together with the political will from governments and donors to include displacement-affected communities as part of nationwide electrification plans to ensure the protection, well-being, and integration of FDP.
Data for needs identification, project design and business model development in displacement settings

Learnings from the World Bank-funded projects “Energy access for host communities and Forcibly Displaced People in the Sahel and Lake Chad Basin”

Thank you!

Maria Ten Palomares
maria.ten@tta.com.es
Sharing of ICRC capacity development work for humanitarian agencies and communities / Project examples

Announcement of Regional training Hubs in Nairobi and Dubai
Peter Leskovsky and Britt Christiaens - ICRC
the Energy and Water Knowledge Centres could be a place of knowledge exchange, inviting important regional actors from financial institutions, private sector, academics and other humanitarian organizations which are implementing their projects with energy components as well. The Energy and Water Knowledge Centres could also foster and craft meaningful partnership including with universities, aid agencies and the private sector”.

ICRC project business case, 2021
Water & Energy Knowledge Hub

- **Regional** training hubs (Nairobi/Dubai)
- **Multilateral partnership**
- ICRC / Strathmore University (SERC)
- Schneider Electric & Grundfos foundation
- Focus on **sustainable energy and water supply**
- Training lab with specialised equipment and tools
- Vocational training for **ICRC staff and operational partners**
- Aspirations: **use by other potential partners** (accredited courses)

More info SERC: [https://serc.strathmore.edu/](https://serc.strathmore.edu/)
Water & Energy Knowledge Hub

Electricity foundation course – Schneider Electric
• Electrical safety
• Introduction to electricity measurements and physics
• Power generation, transmission and distribution
• Transformers, motors and generators
• Wiring, diagrams and installations
• Earthing and lightning safety
• Power distribution panels, MV and transmission lines
• Solar power and mini-grids

Efficient borehole water pumping course - Grundfos
• Basics of hydraulics and electricity necessary for design
• Data collection & analysis for identification of suitable solutions for water supply
• Data use for optimisation of pumping system
• Sizing of pump, pipes, cables, genset, PV (solar panels) and control panel
• Technical specifications for all required material and evaluation of offers
• Supervision, important points to check during installation & commissioning
• O&M training
Water & Energy Knowledge Hub

Electricity foundation course
• Curriculum development: ongoing
• Installation and testing of equipment: June 2022
• ToT training for Strathmore engineers (8-days): July 2022
• Trainings for ICRC engineers (5-days): Sep-Dec 2022

Electromechanical course - efficient borehole water pumping
• Curriculum development: ongoing (+ consultancy)
• Installation of equipment: July 2022
• ToT training for Strathmore engineers (5-days): Sep 2022
• Trainings (5-days): Oct-Dec 2022

+ technical expertise / local resources & solutions / outreach - adaptation to humanitarian context (no “plug and play”)

+ technical expertise / local resources & solutions / outreach - adaptation to humanitarian context (no “plug and play”)
Strategy Documents among internal /organizational changes focus energy related actions to following guidelines/principles:

° activities related to change mind set from “normal practice” to adopting a new principles, modules and materials which can cause access to humanitarian energy and related services for everybody, while using renewable sources, respecting environmental rules and challenges;
° propagating impactful projects models and ideas for covering energy or services supply needs within ICRC AOR (area of operation);
° implementing social science, consumption monitoring in order to develop energy saving strategies for Organization staff and integrate energy conservation practices in ICRC responses;
° investing for long term change and involve external financing through market-based ways to deliver sustainable energy; when considering conduct rehabilitation of urban, water of energy systems – conduct analyses which allow more effective restoration, operation or priority rehabilitation;
° use a new approach towards donors and private sector investors in to project planning, preparation, financing and implementation, to reduce high financial budget impacts, focus on multi-year projects;
° develop energy delivery models which would enhance resilience of essential services for end users;
° orientate to innovative technical and financial partnership to increase and accelerate investments;
° define all stages of Energy Transition – from analyses, to design, implementation, adaptation and evaluation phases;
° include resilience/sustainability criterion in order to eliminate social or socio-economical impact on affected population or community
Gaza Strip could be characterized as “island” bordered by Mediterranean sea, Israel and Egypt. From “energy point of view” it is fully depending on neighboring countries supply (fuel, power). Due to instantly growing demand power supply is scheduled for limited hours. Water supply is depending on power or fuel supply.

ICRC focus is specific, mostly on medical installations, water/power supply and public services support (among others). Project as part of water supply system. As the ICRC contribution towards Gaza resilience, PV power supply was considered hybrid type (PV, grid & fuel generators) with “on grid” with dedicated power line allowing to economically supply “energy surplus” to the Grid. Results collected after 2 years of operation confirmed feasibility of concept with high operational, economic and socio-economic impacts.
Energy (water) challenge in Gaza

**Chronic Electricity Deficit**

- Critical Facilities run way below their design capacities
- About 100,000 generators consume 500,000 liters of fuel daily
- Way forward: increase supply, manage demand
Socio-economic criteria for Project evaluation

- Increasing of power/water supply for almost 1 mil inhabitants;
- Creation of more integrated power supply system following related also to water supply net with application of SCADA (supervisory control and data acquisition), redundant power lines to critical facilities, PV power supply systems using “net-metering” with injection of surplus electricity to grid, implementation of AR (automatic reclosers/switches) to MV lines, smart meters and LV circuit breakers;
- Reduce use of fuel operated generators and related carbon emissions;
- Improve capabilities of desalination and waste-water management plants;
- Significant improvement of power/water supply and quality of life;
- Creation of job offers for local inhabitants;
- Subject of water part of project was Rafah city (220k inhabitants) where is installed 29 wells in net, 8 desalination plants (brackish water) and 1 sea water desalination plant.
Major benefits achieved by implementation of this ICRC Project

- Save the power consumed by one of the main water facilities in Rafah (estimated to save 41% of facility consumption in summer months), save 100% of fuel needs to operate generators, *increased Canada well water production by 36%, increased the water distribution from Canada boosters by 54%, and an overall improvement in the water service provisions in Rafah City from an average of 62 Litters/Person/Day in 2019 to an average of 67 Litters/Person/Day in 2020*,

- **Sustainability of water supply operations** [reduce the dependency on non-renewable energy source (generator), fuel consumption reduction from 13,280 litters in 2019 to 440 litters in 2020, and no generators maintenance,

- The project is deemed to be **financially viable** with pay-back period of 5.46 years in case of 33.40% water bills collection rate. Despite the low water bills collection rate, there is significant increase in CMWU revenues (around 122,000 USD comparing to around 55,000 USD for 2020 comparing to 2019). Shall the economic situation improve in Gaza, and in-turn, the water bills collection rate, the CMWU revenues will increase and ultimately, CMWU may start paying their due electricity bill to GEDCo,

- Contribution to Gaza resilience: secure the power availability in 1 public water well through solar, independent from the public grid if needed.

- Limit the exposure of intervention teams, Contribute in using the net-metering system/on-grid in Gaza and produce documented proof of its practical humanitarian applications and potential benefits.

- **extended working hours of pumping station from 14 hours to 20 hours per day**

- Increase water supply services to part of Rafah Governorate population from once every 3-4 days to once every 1-2 days.
Gaza Project implementation benefits

- Dramatic reduction of generator fuel consumption and CO2 emissions

![Graph showing reduction in fuel consumption and CO2 emissions from 2016 to 2020.](image)

**Public Health:**
- Decrease the likelihood of local public health hazards related to the failure of critical water infrastructures due to disruption of power supply.

**Water Service Delivery:**
- Improve the reliability of power supply to the targeted facility and indirectly part of the general population in Gaza.

**Power Service Delivery:**
- Improve the reliability of the water services for the population served by Canada well.

**Service Provision:**
- Improved preparedness to Emergencies.
SOLAR APPLICATION

Aarsal, Lebanon
Solarization of Pumping Stations in Arsal (124 km N-E of Beirut), Lebanon

About 12 h unstable and irregular power per day

Water production: 1,080 m³/d (~25% of need)

Leaking distribution network (~25-50% losses)

Expensive coping mechanisms, water trucking, bottled water, private networks

Weak water system management and irregular supply to different zones
Concluding on results and challenges

Results
- Water production increase by 35.7% (405 m³/d),
- serving 3'375 additional individuals
- Reduced operational cost, stable water supply during day, water reservoirs enable water distribution overnight.

Challenges
- Limited choice of location
- Landownershi issues
- Fragile organizational environment
- Limited technical knowledge and skills of operators
- Integration with other systemic support activities

Considering present overall crises in Lebanon (limited power and fuel supply, PV powered water sources are significantly increasing of drinking water supply to local population
## PROS & CONS

<table>
<thead>
<tr>
<th>PROS</th>
<th>CONS</th>
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<tbody>
<tr>
<td>Increased production by 35.7% (405 m³/d)</td>
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<td>Additional 3'375 individuals are served</td>
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<td>Reduced operational cost</td>
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</tr>
<tr>
<td>Independent operation from grid power supply</td>
<td>Limited technical knowledge and skills of operators</td>
</tr>
<tr>
<td>Sustainable, clean &amp; echofriendly</td>
<td>Pumps' Motors burning when not specified for solar pumping operation since operating on lower frequencies results in overheating these motors</td>
</tr>
<tr>
<td>Low maintenance required</td>
<td>Electrocution risks due to high DC voltage</td>
</tr>
<tr>
<td>Cost effective and short payback time</td>
<td>Derated output due to dust and soil deposits caused by the landscape which requires frequent cleaning</td>
</tr>
<tr>
<td>Evolving technology reaching higher efficiency values and higher power outputs at a reasonable initial cost increment compared to older products</td>
<td>Derated output due to weather conditions with high temperatures in summer and cloudy days in winter reducing the panels' power generation</td>
</tr>
<tr>
<td>In context: surviving the country’s fuel &amp; electricity crisis</td>
<td>Operation limited to daily sunny hours with zero autonomy: system doesn’t store energy</td>
</tr>
<tr>
<td>Long life span of up to 25 years</td>
<td>Necessity of storing water instead of energy resulting in additional cost for building reservoirs</td>
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Discussion and Audience Q&A
Thank you for attending the Skills and Data session at #HEC2022!