

# WEBINAR ON SUSTAINABLE ENERGY FOR POWERING HOUSEHOLD AND COMMUNITY LIGHTING NEEDS IN HUMANITARIAN SETTINGS

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ICRC



# Webinar Series: Sustainable Energy in Humanitarian Settings

## PAST WEBINARS

- [State of Play: Sustainable Energy in Humanitarian Settings](#)  
JUNE 2019
- [Sustainable Energy for Essential Humanitarian Services: Outline of Energy Solutions and a Case Study on Solar Pumping](#)  
SEP 2019

## UPCOMING WEBINAR

- [Sustainable Energy for Household Cooking Needs in Humanitarian Settings](#)  
28 NOV at 10:30 am CET  
➤ Registration link: <https://register.gotowebinar.com/register/6640996758069902604>



Tell us about you!  
- Poll -



- Agenda -

# Presenter



## **Christopher Carlsen, Lighting Global**

Christopher Carlsen leads policy support activities for the Lighting Global Quality Assurance Program. In his current role, Christopher engages with national governments, regional bodies, development partners and the private sector to bolster an internationally harmonized quality assurance framework for off-grid energy systems. Since joining the Quality Assurance team in 2009, Christopher has implemented a breadth of activities, including product testing, field and lab research, policy development, and direct support for a diverse set of stakeholders, including the humanitarian aid sector.

# Presenter



## **Nicole S. Bouris**, Lighting Global

Nicole S. Bouris is part of Lighting Global (IFC) business development team. As part of her job she also leads the program's workstream in displacement settings. She has developed the program's strategy on how to engage in such situations, worked on an assessment of the energy situation of Syrian refugees in Lebanon, contributed to IFC's strategy on forced displacement, and with Chris she assists humanitarian agencies on their energy programs. Before joining IFC, Nicole worked for Trine in Kenya, UNICEF in Lebanon and co-founded a startup in Milan.

# Sustainable Energy for Powering Household and Community Lighting Needs in Humanitarian Settings

Christopher Carlsen & Nicole S. Bouris  
14<sup>th</sup> November 2019



# Lighting Global Quality Assurance Program

Contributes to achieving the goal of universal **energy access** by helping **retailers, investors, procurement programs,** and other **buyers** easily identify quality **off-grid solar products** and reduce risk.

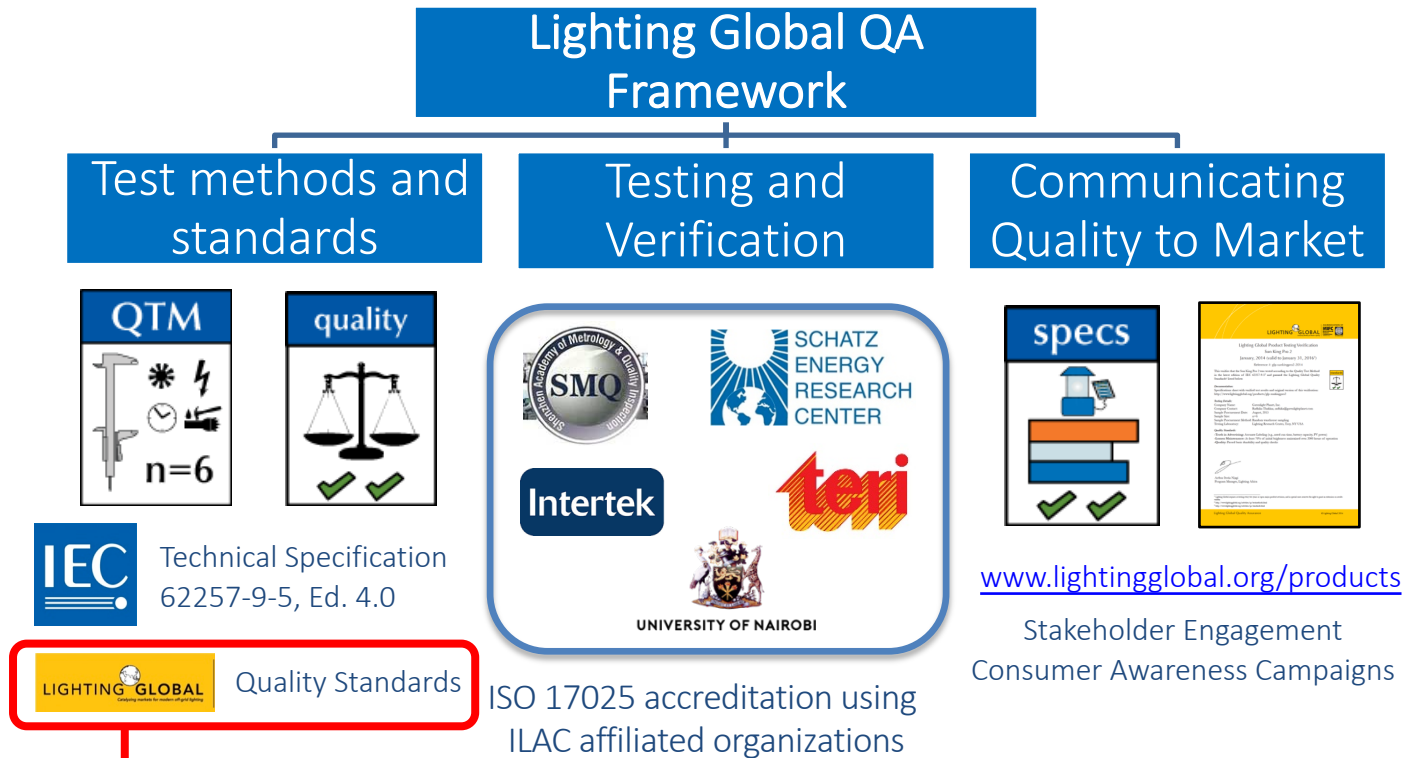


Part of the broader **Lighting Global** market development program, run by the **World Bank Group**





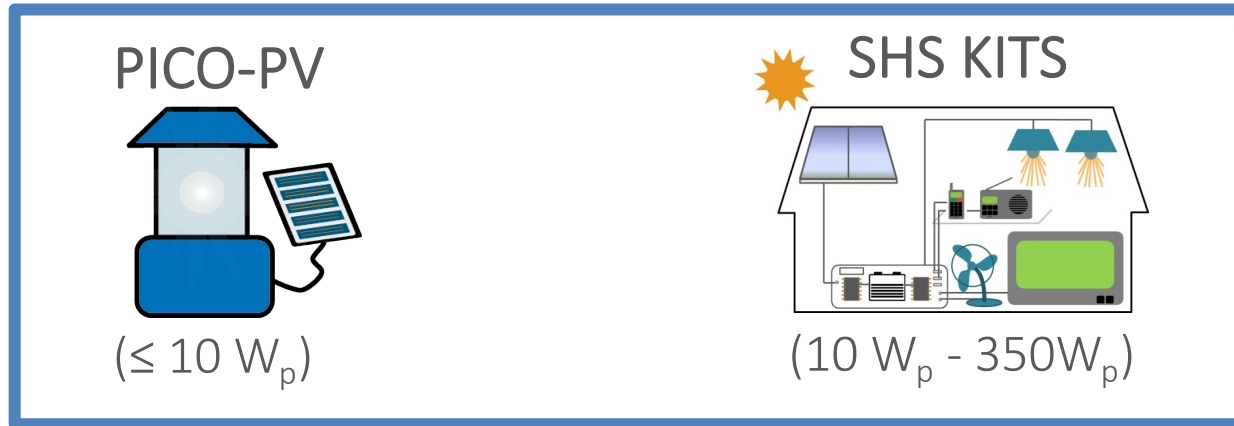
# Lighting Global Quality Assurance Primary Program Elements



To be adopted by IEC in early 2020

# Lighting Global Quality Standards

*The most widely-recognized international standards for pico-PV and SHS kits*



- Baseline levels of **quality, durability, and truth-in-advertising** to protect consumers
- Non-prescriptive and technology neutral
- Conformance evaluated using results from **laboratory testing** (IEC TS 62257-9-5)
- Tests conducted at **third-party, approved test centers** (ISO 17025 accredited)

# Quality-verified Products:

A wide range of sizes, services and costs



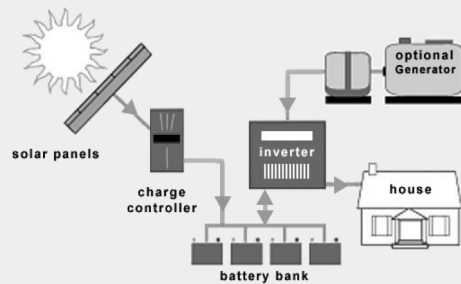
## PRODUCT DATABASE

[www.lightingglobal.org/products/](http://www.lightingglobal.org/products/)

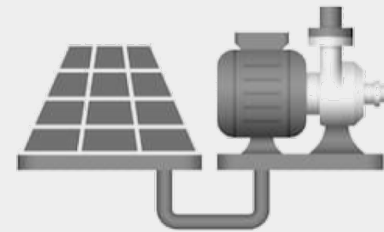
- All quality-verified products
- Standardized Specifications Sheets
- Verification Letters (type approvals)

# Lighting Global Quality Assurance: What's outside the current scope?

- Systems with peak power greater than 350 watts
- Systems with AC output
- Custom component-based SHS
- QA for standalone and productive-use appliances; e.g. TVs, fans, solar water pumps, etc.



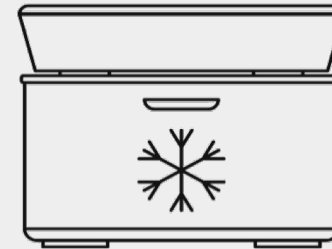
Source: <https://energyinformative.org/grid-tied-off-grid-and-hybrid-solar-systems/>



Source: <https://www.shutterstock.com/image-vector/water-pump-solar-energy-icon-design-1464476783>



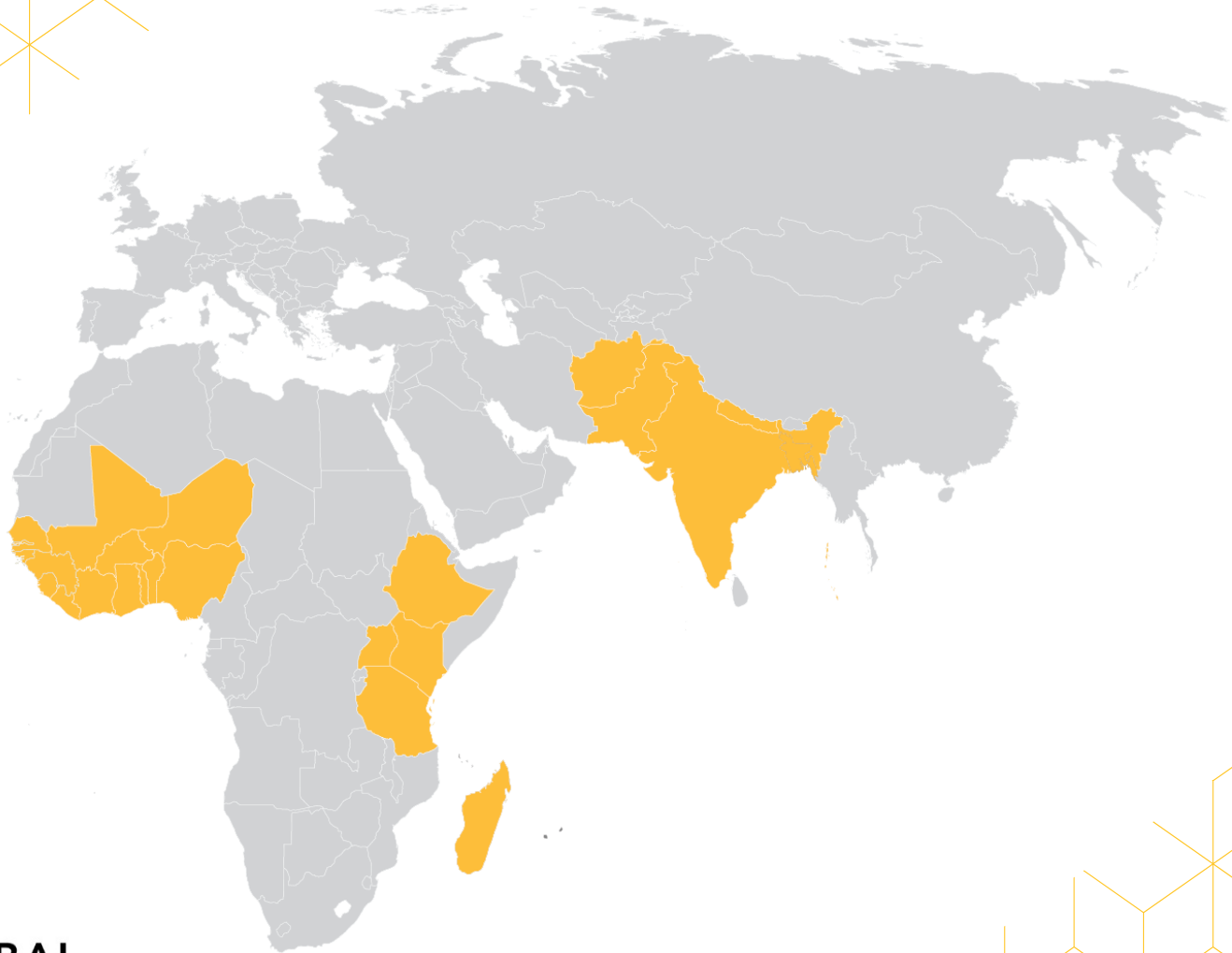
Source: <https://www.istockphoto.com/vector/thin-line-icon-grinding-milling-of-seeds-grains-gm1063758826-284400033>



Source: <https://www.vectorstock.com/royalty-free-vectors/freezer-deep-box-vectors>

# Standard-Setting Activity for Off-Grid Solar Products

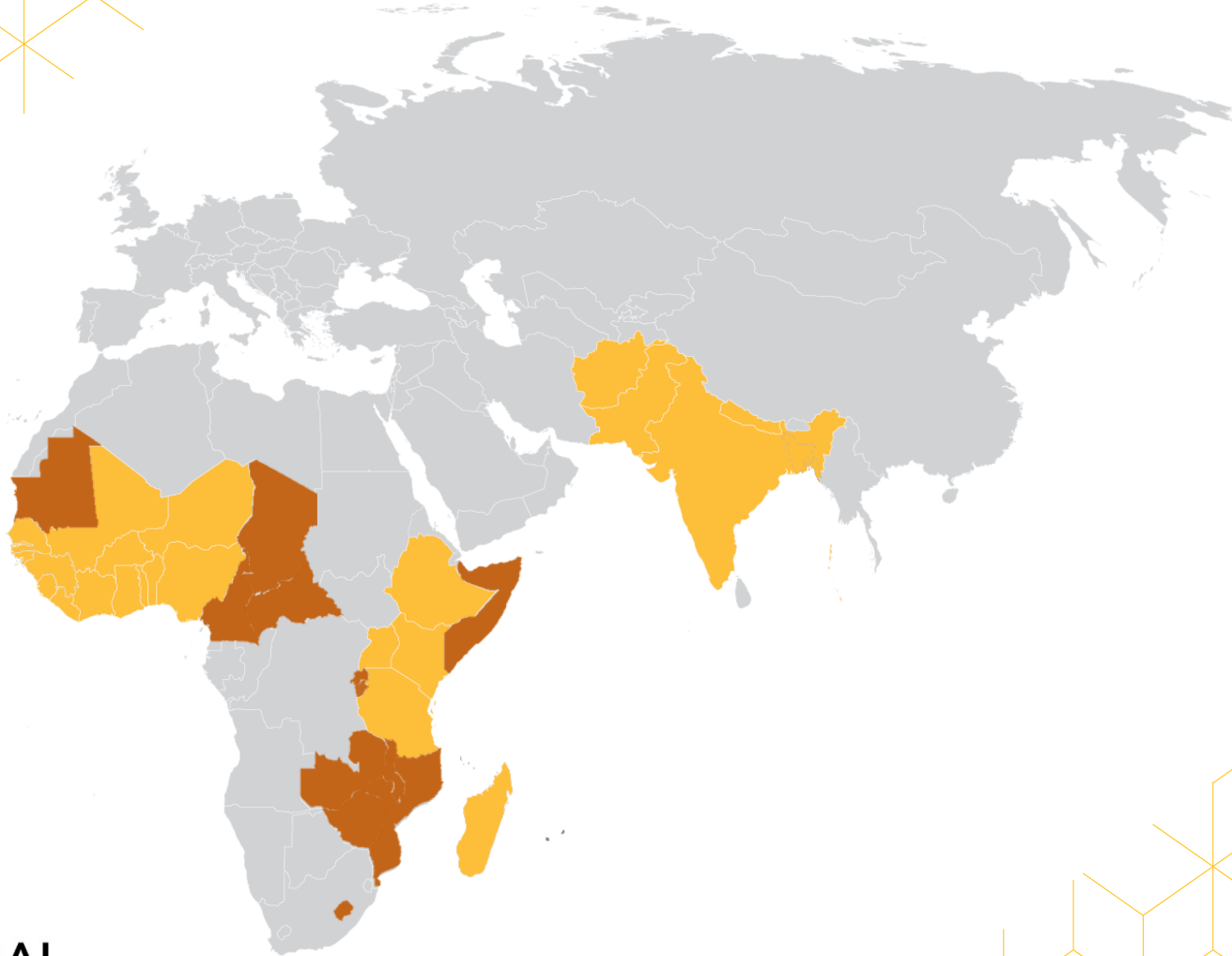
National governments and regional groups with large markets for pico-PV and SHS kits are pursuing quality standards aligned with Lighting Global Quality Assurance.



# Increased Interest in Quality Standards

More countries and regional bodies are expected to pursue adoption of IEC standards.

Energy access programs are increasing support for quality assurance activities.



# Standards Harmonization: Bringing benefits to a broad set of stakeholders

Harmonized standards reduce the prevalence of sub-standard products while fostering innovation and maintaining consistency across international markets.



## CONSUMERS & MARKETS

- Increased market consistency
- Reduced market spoilage
- Increased sales and market growth
- Greater variety of high quality products available
- Reduced cost of doing business and product prices



## STANDARDS AGENCIES, CUSTOMS & CONFORMITY ASSESSMENT PROGRAMS

- Increased confidence in standards
- Minimal investment required
- Increased ease of standards adoption
- Simplified regulations



## OTHER STAKEHOLDERS BENEFITTING FROM HARMONIZED STANDARDS

- Bulk procurers
- Development agencies
- Manufacturers
- Importers & Distributors
- Financial institutions
- Finance programs
- Investors

# Humanitarian Aid Organizations: Leveraging harmonized standards

## Organizational Benefits

- Increased confidence in product quality & performance, reducing programmatic risk
- Strengthened tenders through access to data, resources & technical support
- Increased product selection & transparency, simplifying bid evaluation
- Streamlined program development and implementation

## Broader Impacts

- Protect consumers
- Align approach with governments and other programs
- Support sustainable market development & growth
- Encourage product quality and innovation





# What can you do now?

- **Learn more**  
Resources and guidance available from Lighting Global website & QA Team
- **Insist on quality**  
Require that products meet international standards
- **Know regulations**  
Imported products must comply with national/regional laws & standards
- **Understand beneficiaries**  
Consider users' energy needs, expectations & use cases
- **Create awareness**  
Inform stakeholders of the importance of quality & diversity of product options

# A Private Sector Perspective of Protracted Displacement Situations

There is an increasing need and opportunity of private sector involvement in protracted situations

## Know your Market:

- Travelling to and from the area
- Total and target population & demographics
- Country's regulations on: right to work and encampment
- **Market Assessment**
- Private Sector challenges



Click on the image to access the report

## Other useful IFC reports:

- [Kakuma as a Marketplace](#)
- [Private Sector & Refugees: Pathways to Scale](#)

# Energy Market Assessments from a Private Sector Perspective: The Case of Lebanon

## Demand

### Current Expenditure & Income

Power Supply & Energy Needs

Solar Use & Awareness

Willingness to Pay

## Supply

Current Products Sold

Financing Options

Interest in Selling Solar

## Market

Potential Demand

Potential Gross Sales

Cohort	Monthly Income	Monthly expenditure Grid + Gen
Lebanese host communities	\$ 777.11	\$ 72.24
Syrian refugees in camps	\$ 143.25	\$ 27.16
Syrian refugees in rented accommodations	\$ 200.12	\$ 46.09

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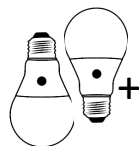
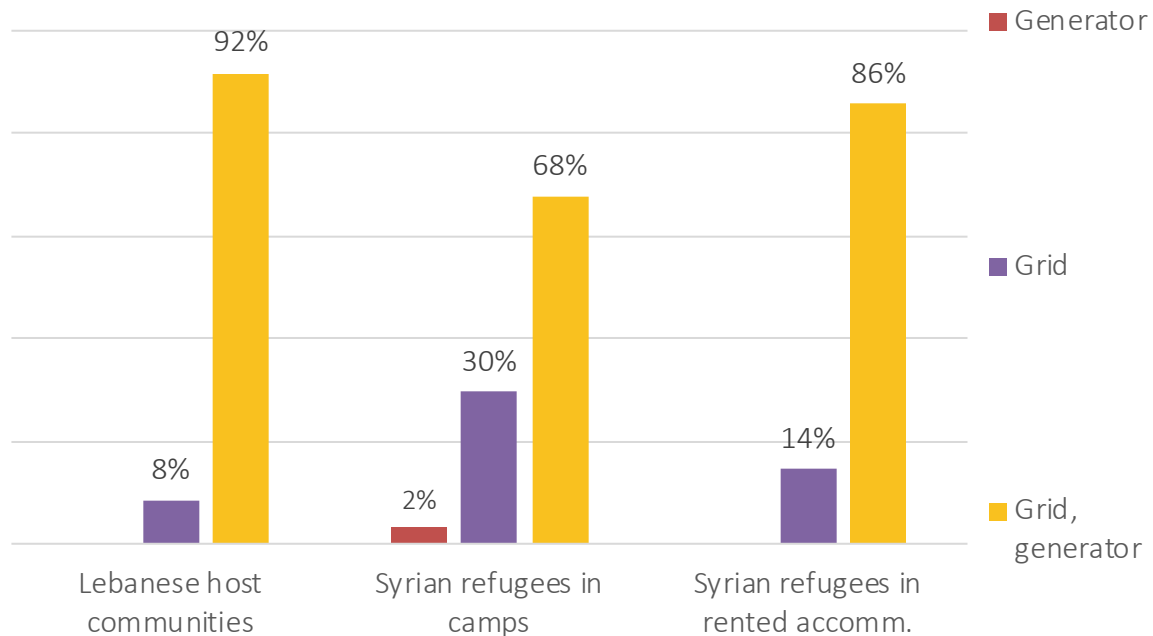
Interest in Selling Solar

## Market

Potential Demand

Potential Gross Sales

What is your main source of power supply?



97%



93%



97%



80%

# Energy Market Assessments from a Private Sector Perspective: The Case of Lebanon

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Current Expenditure & Income

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Willingness to Pay

## Supply

Current Products Sold

Financing Options

Interest in Selling Solar

## Market

Potential Demand

Potential Gross Sales

**75%** Do not sell any solar products

**50%** Do not provide retail financing

**9%** Would finance refugees



# Energy Market Assessments from a Private Sector Perspective: The Case of Lebanon

## Demand

Current Expenditure & Income

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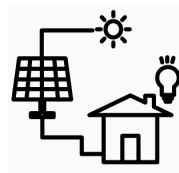
Financing Options

Interest in Selling Solar

## Market

Potential Demand

Potential Gross Sales



20,000 – 25,000 SHSs



\$ 5 Million

# Energy Market Assessments from a Private Sector Perspective: Comments and Recommendations

What do these results tell us

Previous living conditions shape energy use more than current affordability levels

Choose technology that fulfills people's needs: i.e. refrigerators

Displacement settings = untapped markets **PERCEIVED** as too risky by private sector

What we recommend to continue facilitating private sector involvement

Financing is key:  
Involve MFIs

Pilot interventions are essential at this stage to reduce market entry risks

# Contacts and Useful Lighting Global Resources

## Contact us at:

Christopher Carlsen [ccarlsen@clasp.ngo](mailto:ccarlsen@clasp.ngo)

Nicole S. Bouris [nbouris@ifc.org](mailto:nbouris@ifc.org)

## Useful Resources

- [Procurement of Stand-alone Solar Kits for Humanitarian Aid](#)
- [Solar Home System Kit Quality Standards](#)
- [Pico-PV Quality Standards](#)
- [Quality Matters](#)
- [Benefits of Harmonizing Test Methods and Quality Standards](#)



THANK YOU



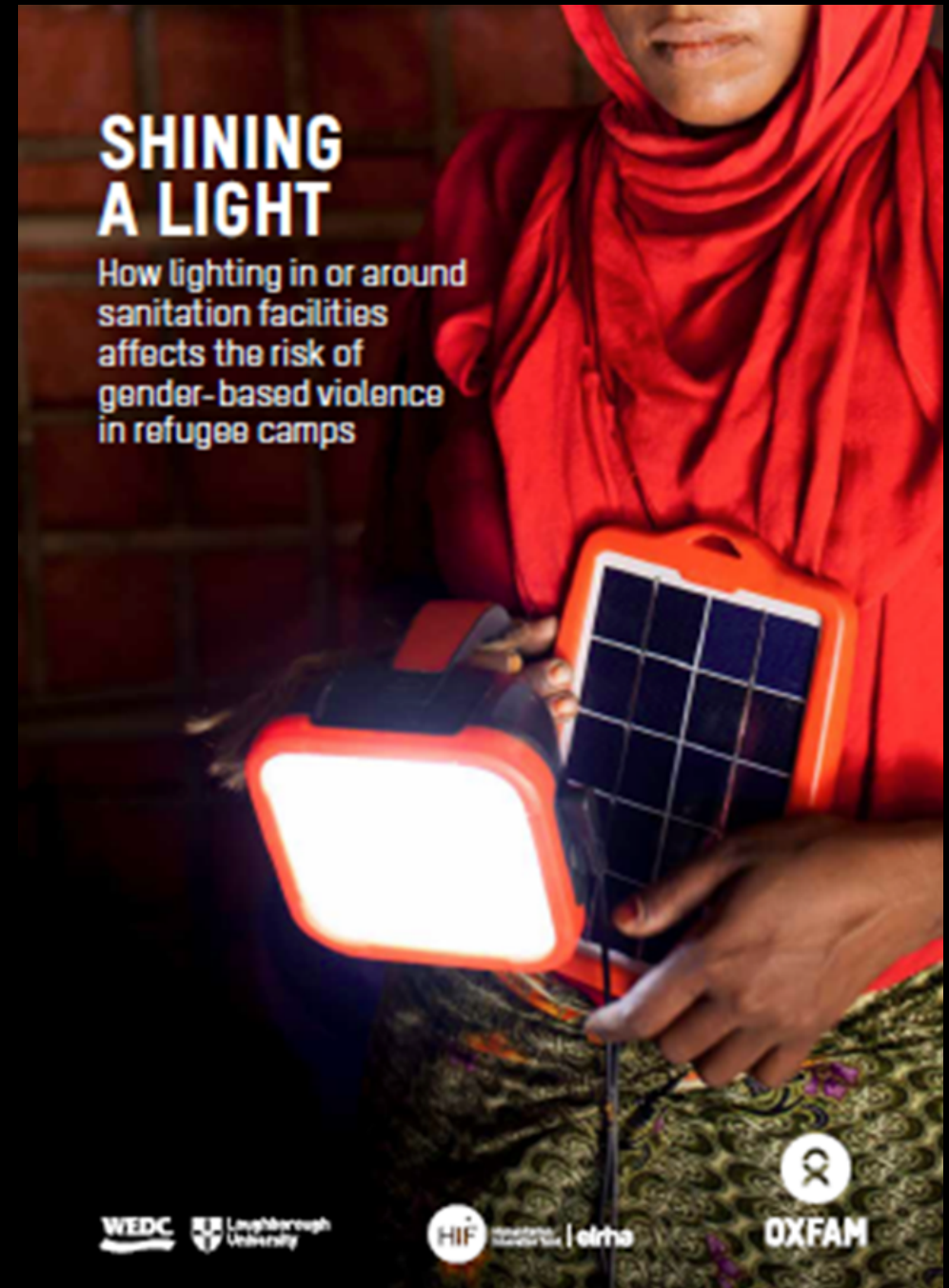
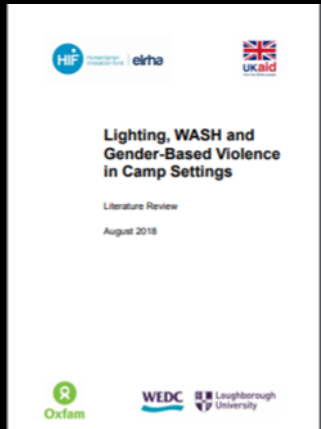
# Presenter



**Rachel Hastie, Oxfam**

Rachel has worked for Oxfam GB for more than 16 years in field and headquarter posts implementing and supporting humanitarian programmes. Since 2016 she has been the Protection Team Leader for the Global Humanitarian Team.

# Lighting in humanitarian responses



[www.oxfam.org.uk/lighting](http://www.oxfam.org.uk/lighting)

# Main findings

Demand for lighting is increasing

Lighting makes people feel safer

Access to lighting is gendered

Links to sanitation

Lighting has multiple benefits beyond safety

Co-ordination: coverage, quality and delivery modalities are problematic



# Lighting recommendations

People need multiple forms of lighting

Solar valued – but high reliance on battery torches

Functionality matters

High quality & sustainable with warranties

Promote community-based approaches to avoid public lighting 'graveyards'



# the future: Sustainability

Massive potential for innovation in delivery including market-based approaches

Community-based public lighting & potential income generation

Need for multi-sectoral coordination structures & strong technical guidance

Design with people – think gender, disability, power dynamics



## PUBLIC LIGHTING

### OPTIONS CAN COVER:

- the whole camp
- the main pathways and junctions
- inside and outside key services (e.g. medical centre)
- inside and outside communal/neighbourhood facilities (e.g. latrines)

### TIP

Ensure that all lights – public or household – have warranties that both you and the community can activate if necessary.

### LIGHTS CAN BE:

- **multidirectional** for general ambient lighting

- **unidirectional** for lighting a specific area

- **wall or ceiling** lights on the interior or exterior of buildings or structures

- **strings** of lights



### BRIGHT IDEAS:

Public lighting should be positioned and angled to correctly illuminate the target area and avoid causing light pollution in shelters.

Public lighting must be:

- based on sustainable energy
- cyclone/storm proof
- vandal/theft proof
- waterproof
- easily maintained by local people
- easy to find spare parts for



## PEOPLE NEED MULTIPLE

### HOUSEHOLD AND INDIVIDUAL LIGHTING

#### ACCESS TO AND CONTROL OVER LIGHTING IS GENDERED

Women and girls often have less access to lighting than men and boys, even when lights are distributed to all households.

Community power dynamics mean the most marginalized and vulnerable people often have less access to light and are more vulnerable to theft.

Assessments, consultations and community-based initiatives need to take measures to ensure the equal inclusion of all members of the community, including women and girls, elderly and disabled people, and sexual and gender minorities.



#### PORTABLE OPTIONS

Lanterns or lamps can be hung up to light a shelter and give general ambient light, or used on high power for specific tasks (e.g. reading or cooking). They should be robust, water resistant and have energy-saving settings. Integrated mobile phone chargers are popular.



Torches should be light and portable with a directional beam to facilitate movement. Hands-free is useful and the ability to be hung up, energy-saving settings, water resistance/waterproofing and integrated phone chargers are popular.



## CAMPS NEED A COMPREHENSIVE LIGHTING STRATEGY

1. Prioritize lighting for the safety of the most vulnerable people.

2. During the first phase, a blanket distribution may be required but this should swiftly shift to a more participatory community-based approach.

3. Purchasing locally can boost the economy and reduce tensions with the host communities, but make sure that quality and safety standards are met.

4. Involve camp management, site planning, protection, shelter and IDP actors, and a range of community representatives.

5. Prioritize low cost, renewable and sustainable energy sources.

6. Agree joint technical standards to ensure adequate coverage and consistent quality.

## FORMS OF LIGHTING

### COMMUNITY-BASED LIGHTING IS MORE EFFECTIVE AND SUSTAINABLE



Community groups can help facilitate assessments, identify priority locations and households, test the lights, and train others on how to maximize efficiency and use all available functions.

'Community-based' means more than consultation and feedback – it requires actively and consistently working in partnership with camp residents.

Many refugees and IDPs have existing skills or could be trained to play a technical role in lighting projects.

#### Community Lighting Groups can:

- enable the active involvement of women, girls and other groups who may be socially marginalized,
- build community ownership of public lighting
- deter anti-social behaviour, theft and vandalism
- monitor performance of lights and quickly identify problems
- carry out basic maintenance, such as cleaning solar panels, clearing vegetation and checking for the erosion of foundations
- liaise with the community to identify problems (e.g. light pollution into shelters and repositioning suggestions)
- provide feedback on the impact of lighting and enable bilateral communication with the community.

# Presenter



## **Cecilia Ragazzi, Mercy Corps**

Cecilia has a 10-year experience in the humanitarian and development sector covering advisory, management and consulting positions in diverse cultural and geographical contexts, including Bangladesh, Haiti, Afghanistan, Libya, Jordan, Philippines, Democratic Republic of Congo, Niger, Nepal, Indonesia, Senegal, and Mali. She started nurturing her interest in women economic empowerment through renewable energy managing a multi-country and multi-partner EC program in the Sahel region (Mali, Senegal and Niger). Cecilia is part of Mercy Corps' Technical Support Unit Environment Team as Senior Advisor for Humanitarian Partnerships on Energy Access. She is based in Mercy Corps' Edinburgh office and she supports country teams in humanitarian settings across the world.



# Presenter



## **Baryalai Sadiqi, Mercy Corp**

Baryalai Sadiqi holds a Bachelor's Degree in Civil Engineering from University of Pune, India on Environmental Engineering. He has been working with Mercy Corps in its native Afghanistan for more than 7 years, contributing to the set-up of the Renewable Energy Department. He is specialized in solar PV systems, including design, implementation, supervision, and management. Presently, he is Program Manager for the expanding Renewable Energy portfolio for Mercy Corps Afghanistan.



# MERCY CORPS – ACCESS TO ENERGY

**CECILIA RAGAZZI**

Senior Advisor, Humanitarian Partnerships – Energy Access



# Who we are



# Our approach to access to energy in humanitarian settings



# What we see



1.1 billion people live without electricity;  
80-90% of displaced people rely on biomass  
for cooking and lighting;  
3 billion people use solid fuels for cooking,  
causing 4 million deaths annually



**27B USD /year spent on energy;**  
**Technology is moving fast, and prices are**  
**reducing;**  
**Private investments & flexible financing systems**  
**are developing**



**Our humanitarian approach:  
acute emergency**



# Our humanitarian approach: complex crisis

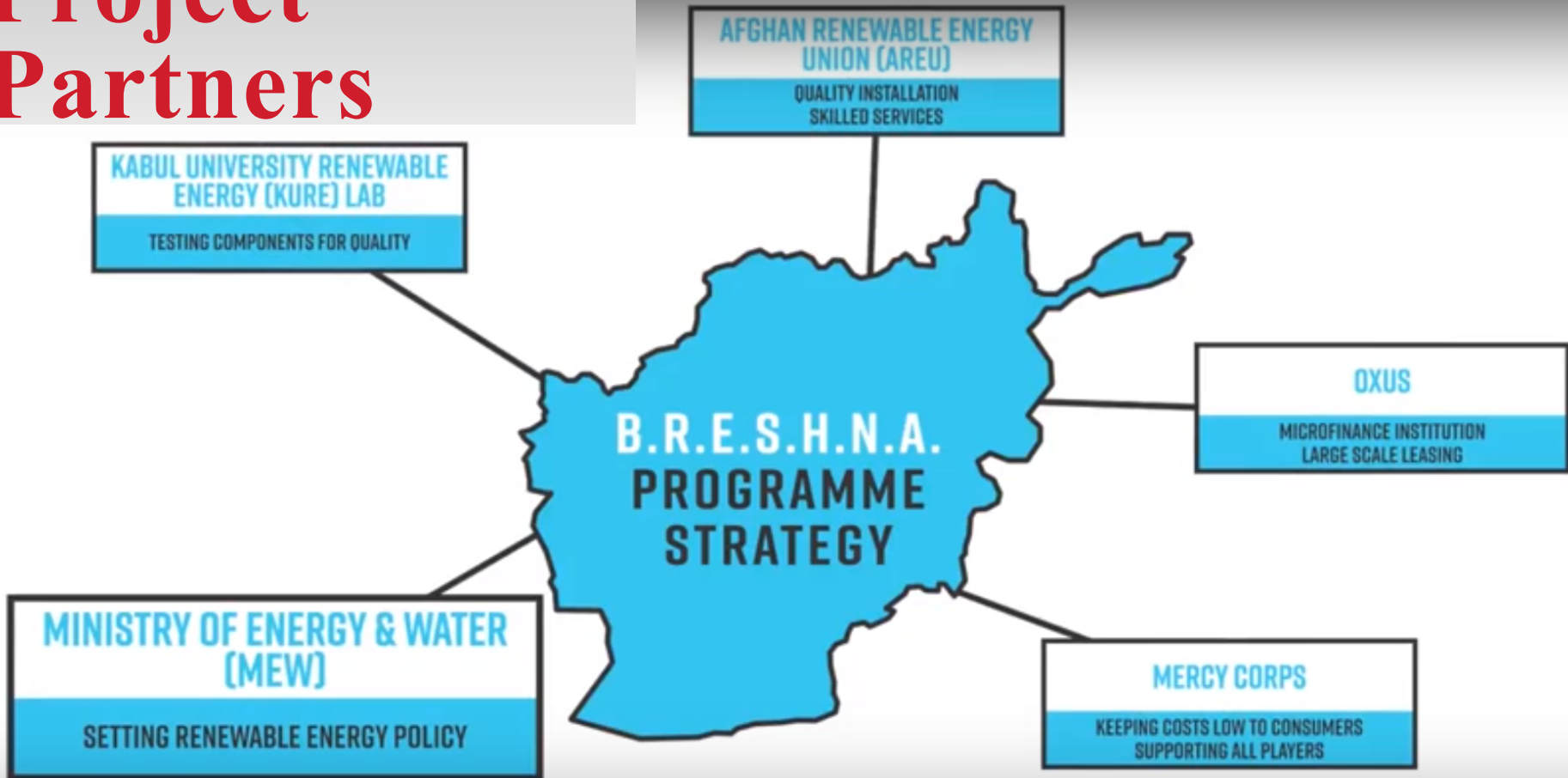


# Spotlight: Access to Energy - Afghanistan

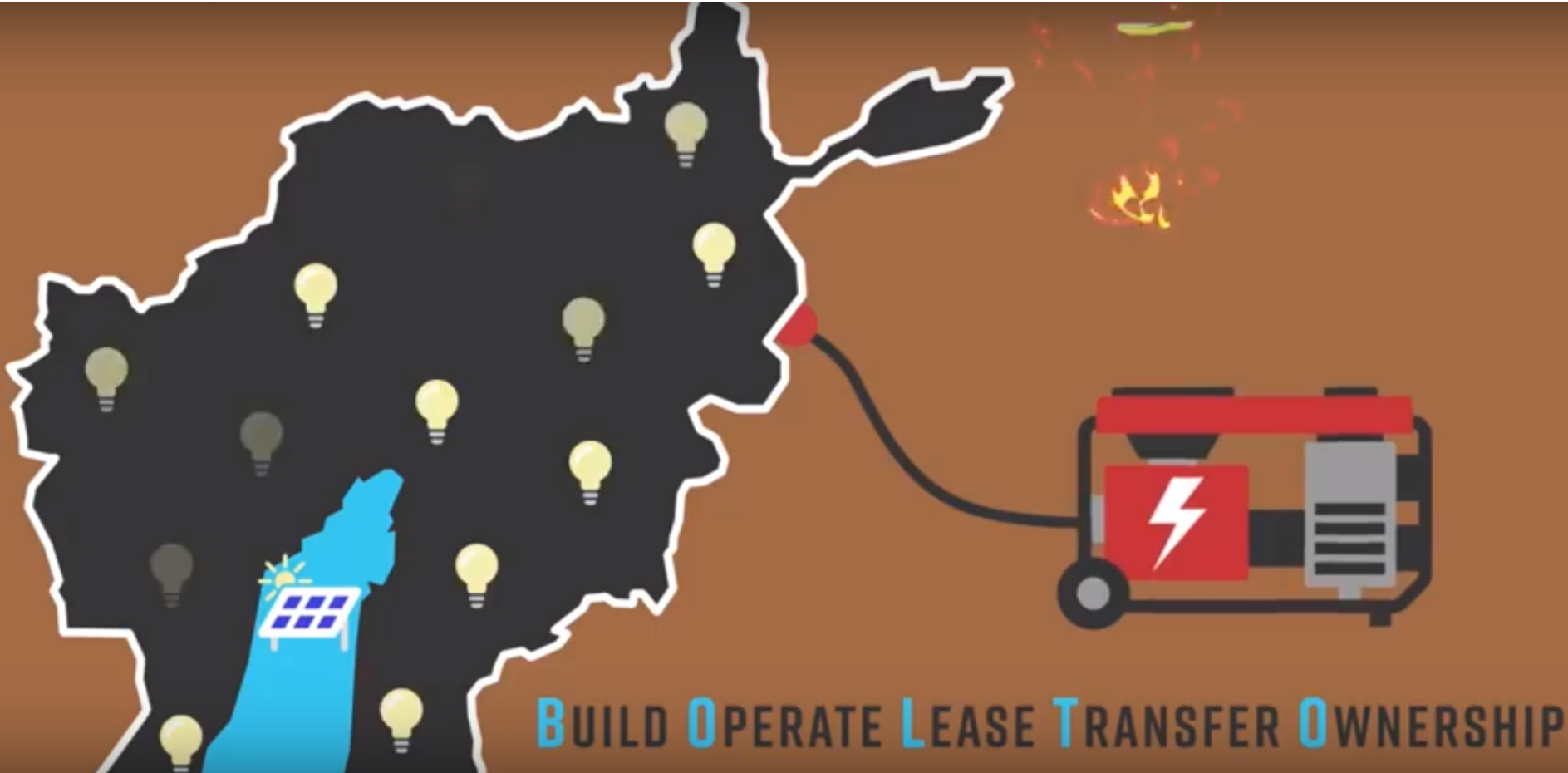




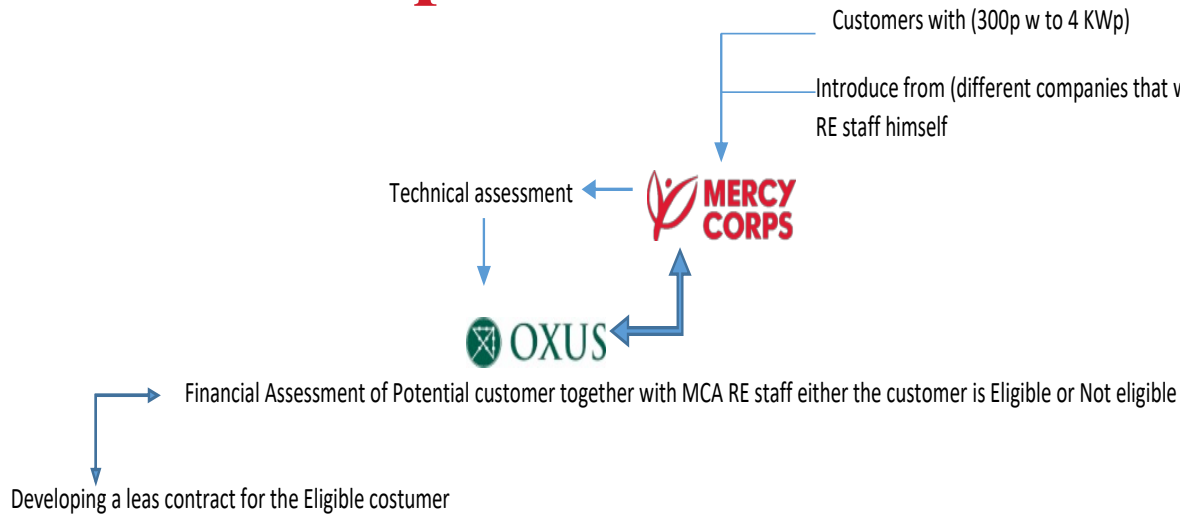
# BRESHNA Project Partners



# BRESHNA project BOLTO model



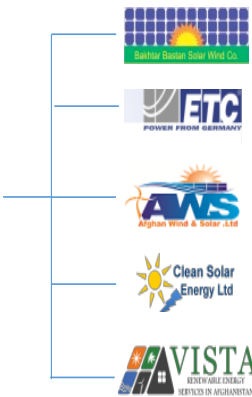
# Built and Operate Process



After the lease contract the Eligible customer will be a real customer for MCA, and MCA will design a solar package for customer



Bidding Process



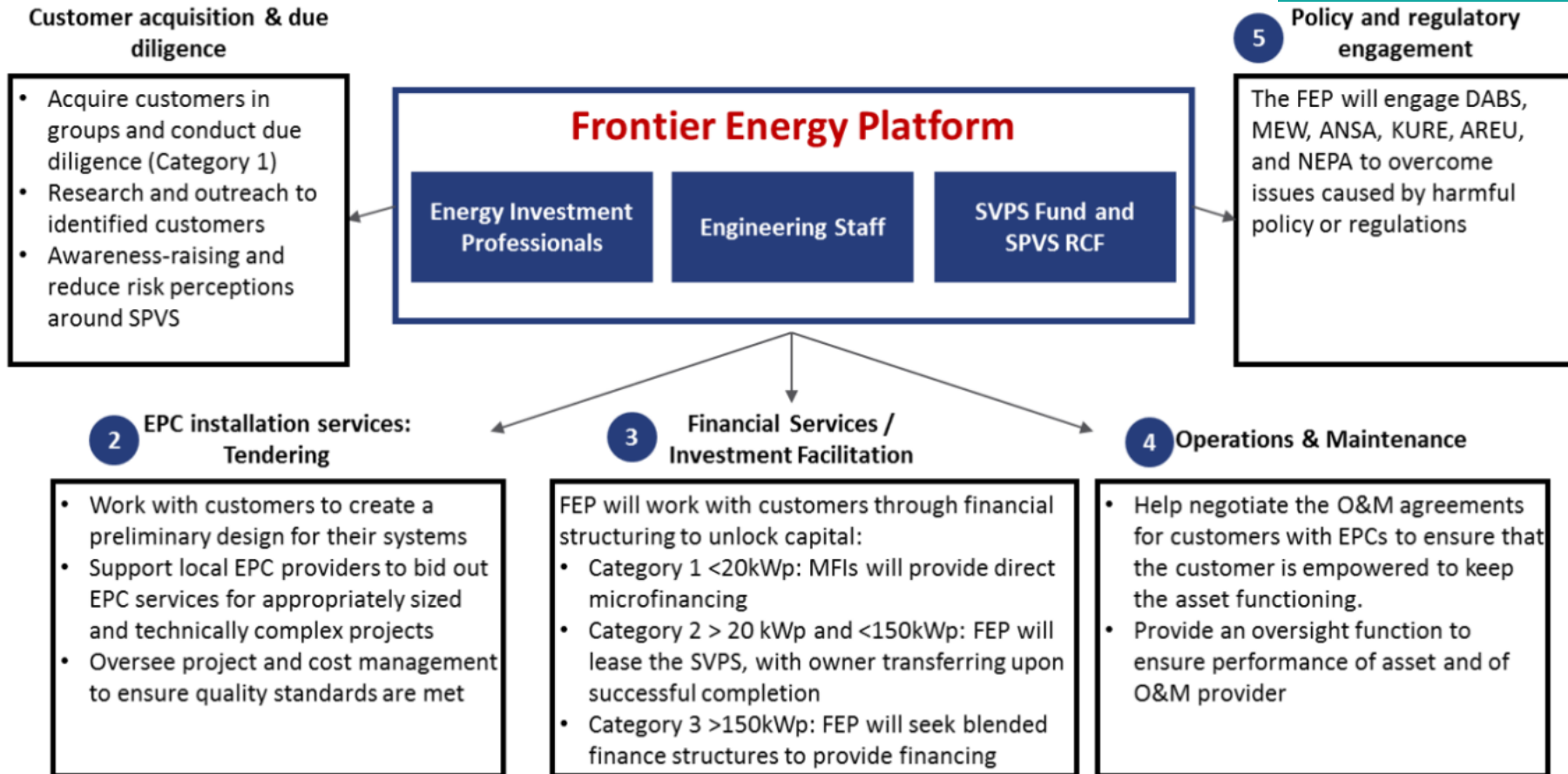
in bidding process one of the EPC Company will be selected with good quality and lower price



Overall monitoring of the installation process by MC



# Overview of Frontier Energy Platform Functions



Questions?



# References

- › [Mercy Corps Access to Energy](#)
- › [Video: Mercy Corps Access to Energy Approach](#)
- › [Video: BOLTO model](#)
- › [Video: BRESHNA project](#)
- › [Mercy Corps Off-Grid Electrification](#)



*Thank You!*

# Presenter



## **Philip Sandwell, Practical Action**

Dr Philip Sandwell is a Research Associate at Practical Action and Imperial College London where he researches the implementation of energy projects in developing countries and humanitarian settings. For the past two years he has worked on the Renewable Energy for Refugees Project, a partnership between Practical Action and UNHCR, which provides sustainable energy solutions to three refugee camps in Rwanda and in urban settings in Jordan. He holds a PhD in Physics from Imperial College London, which focused on techno-economic modelling of minigrids, and a master's degree in Theoretical Physics.



# RENEWABLE ENERGY FOR REFUGEES (RE4R) PROJECT

## SOLAR HOME SYSTEMS IN REFUGEE CAMPS IN RWANDA

Practical  
**ACTION**

**DR. PHILIP SANDWELL**



# ABOUT PRACTICAL ACTION AND THE RE4R PROJECT

Practical Action is an international development organisation putting ingenious ideas to work so people in poverty can change their world.

**Practical  
ACTION**



- Partnership between Practical Action and UNHCR, funded by the IKEA Foundation
- Delivering market-based renewable energy investments in humanitarian settings, working directly with refugees and host communities

**CHATHAM  
HOUSE**

The Royal Institute of  
International Affairs

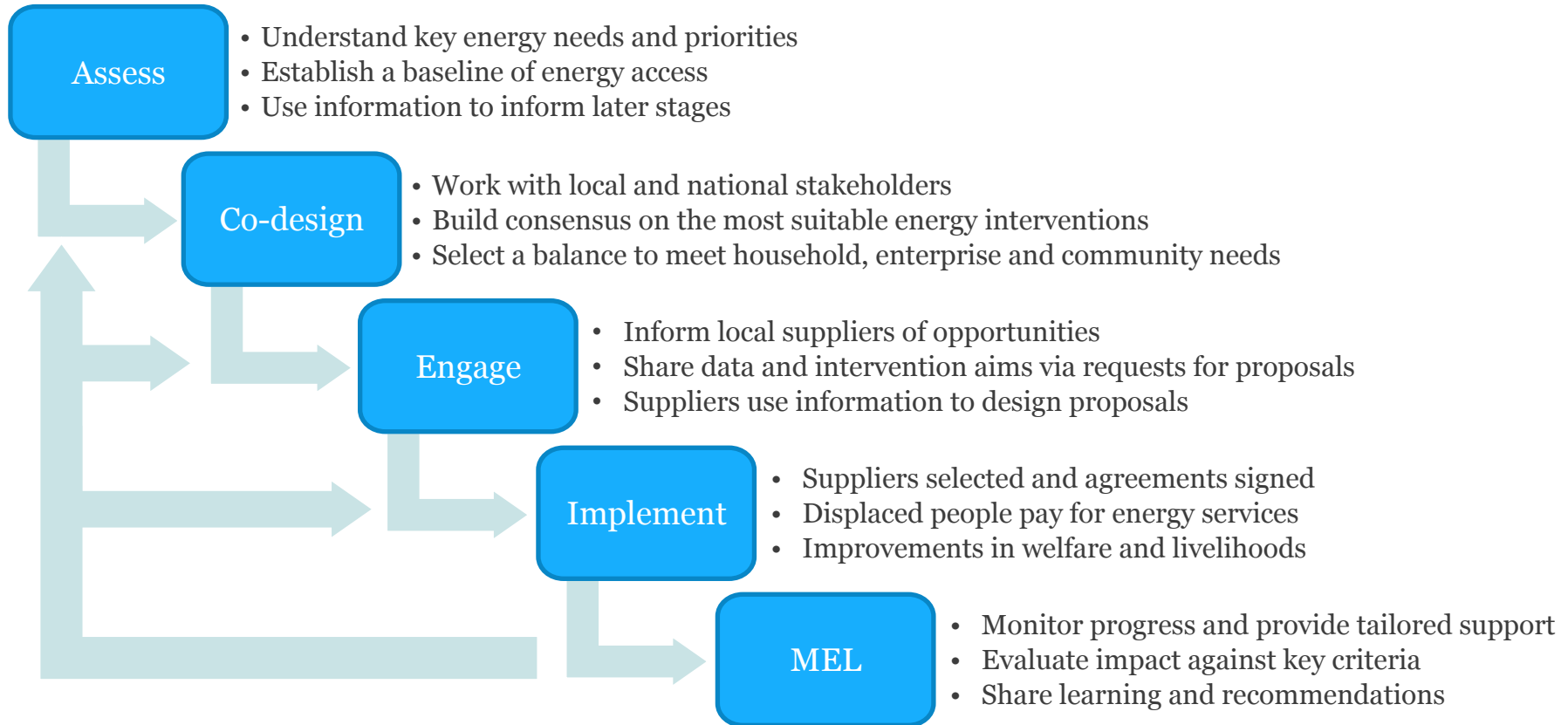


NORWEGIAN  
REFUGEE COUNCIL

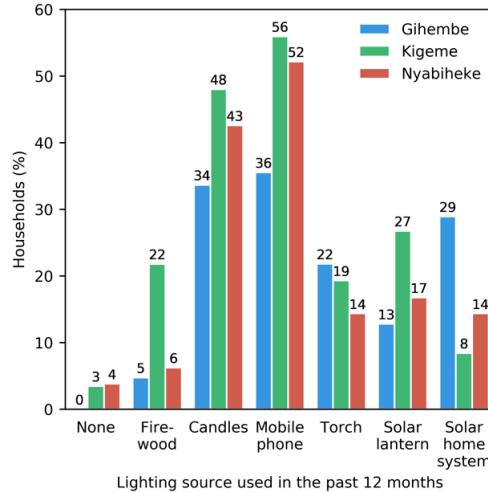
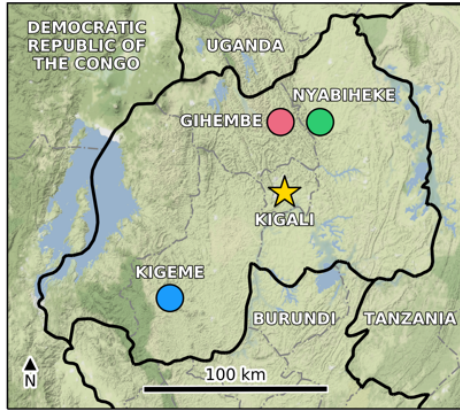
- Working in:
  - Urban settings in Irbid, Jordan
  - Camp settings in Gihembe, Kigeme and Nyabiheke camps in Rwanda



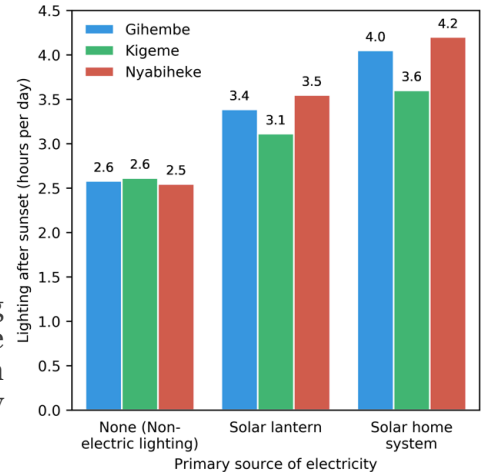
# THE RE4R PROCESS TO INTERVENTION DELIVERY



# FINDINGS FROM THE RE4R ASSESSMENT PHASE



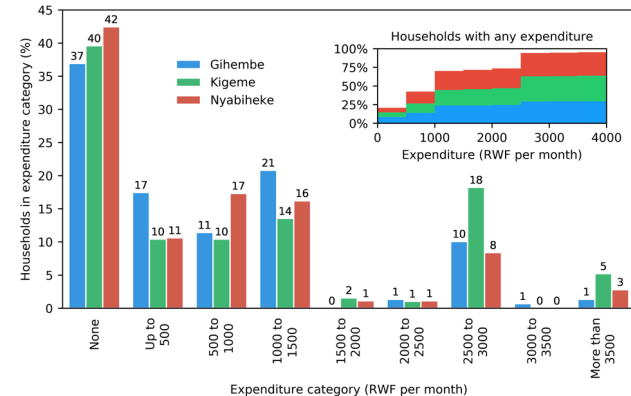
Most households rely on combinations of basic sources of lighting



Improved lighting technologies provide tangible increases in lighting availability

- Households ranked their own energy needs as the most important to be addressed
- Working, studying and doing chores were the most important reasons why electric lighting is important
- Lighting, phone charging and radios/televisions were the most important uses if energy were available

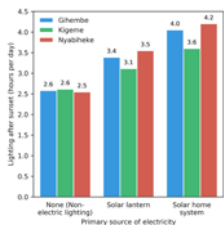
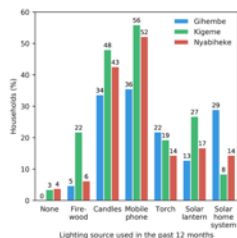
Households have modest expenditure on non-renewable lighting sources



# INTERVENTION I: SOLAR HOME SYSTEMS FOR HOUSEHOLDS AND SMALL ENTERPRISES

## Assess

Quantitative surveys, focus groups, interviews and markets assessments



- Limited access to lanterns and SHSs
- SHS provides highest service levels
- High preference ranking for basic electricity services

Domestic electricity access is very low and can be improved by greater access to solar home systems

Intervention II: Renewable biomass and advanced cooking  
 Intervention III: Solar powered community street lighting  
 Intervention IV: Solar power for institutions and enterprises

## Co-design

Workshop with stakeholders to select interventions, followed by further scoping and design

### Intervention I: Renewable electricity services for households and small enterprises

- Increase camp-wide access to SHSs
- Decrease spend on candles and batteries
- Ensure service quality
- Training and capacity building

## Engage

Competitive process to select SHS suppliers to deliver intervention in the three camps

Expression of interest

Supplier questions

Request for proposals

Proposal evaluation

Supplier selection

- Suppliers integrated intervention aims to their existing business models
- Goals shared in advance and informed by assessment data

# ENGAGING WITH SUPPLIERS FOR MARKET-BASED INTERVENTIONS

How do we go from assessments to private sector delivery models?

What information do we need to provide for suppliers to design effective proposals?

## Market size

- Camp population
- Location and local area
- Current levels of access
- Technologies being used
- Intervention goals

## Market viability

- Occupations and income
- Livelihoods opportunities
- Household expenditure
- Ability/Willingness to pay\*
- Intervention support

## Supplier support

- Visits to camps
- Demystification of camps
- Multi-step evaluation
- Fit with existing models
- Intervention flexibility

Information to propose and implement effective interventions

Enablers and intangible information for supplier engagement

# RECOMMENDATIONS FOR SUPPORTING MARKET-BASED INTERVENTIONS

## Understand the situation and goals

- Certain key data is crucial in designing interventions (but often unknown)
- Work with stakeholders to understand how interventions fit in the wider environment
- Clear, measurable goals for interventions help engage external stakeholders

## Anticipate what suppliers need

- Private sector actors need an understanding of their potential market
- Entering in a new area can be a significant business risk
- Adapting existing business models can make long-term sustainability more likely

## Work in partnership

- Guide private sector partners as they entering a new market
- Provide feedback to meet intervention goals without compromising business models
- Coordinate, share experience and expertise to deliver sustainable interventions

**Practical  
ACTION**

Thank  
**YOU**







- Q&A -

# Thank you

- **Feedback:** [info@energypedia.info](mailto:info@energypedia.info)
- **Webinar documentation/Additional Resources:**  
[https://energypedia.info/wiki/Webinar\\_Series:\\_Sustainable\\_Energy\\_in\\_Humanitarian\\_Settings\\_-\\_3rd\\_Webinar](https://energypedia.info/wiki/Webinar_Series:_Sustainable_Energy_in_Humanitarian_Settings_-_3rd_Webinar)
- **Register for our upcoming webinar on Sustainable Energy for Household Cooking Needs in Humanitarian setting:**  
**28 NOV at 10:30 am CET**  
➤ **Registration link:** <https://register.gotowebinar.com/register/6640996758069902604>

