



COMMUNITY  
ENERGY  
TECHNOLOGY  
IN THE MIDDLE EAST



[www.comet-me.org](http://www.comet-me.org)

# The Lowest Place: Big rural electrification micro-grids in the Dead Sea region and why they are needed



**HOMER** MICROGRID AND  
HYBRID POWER

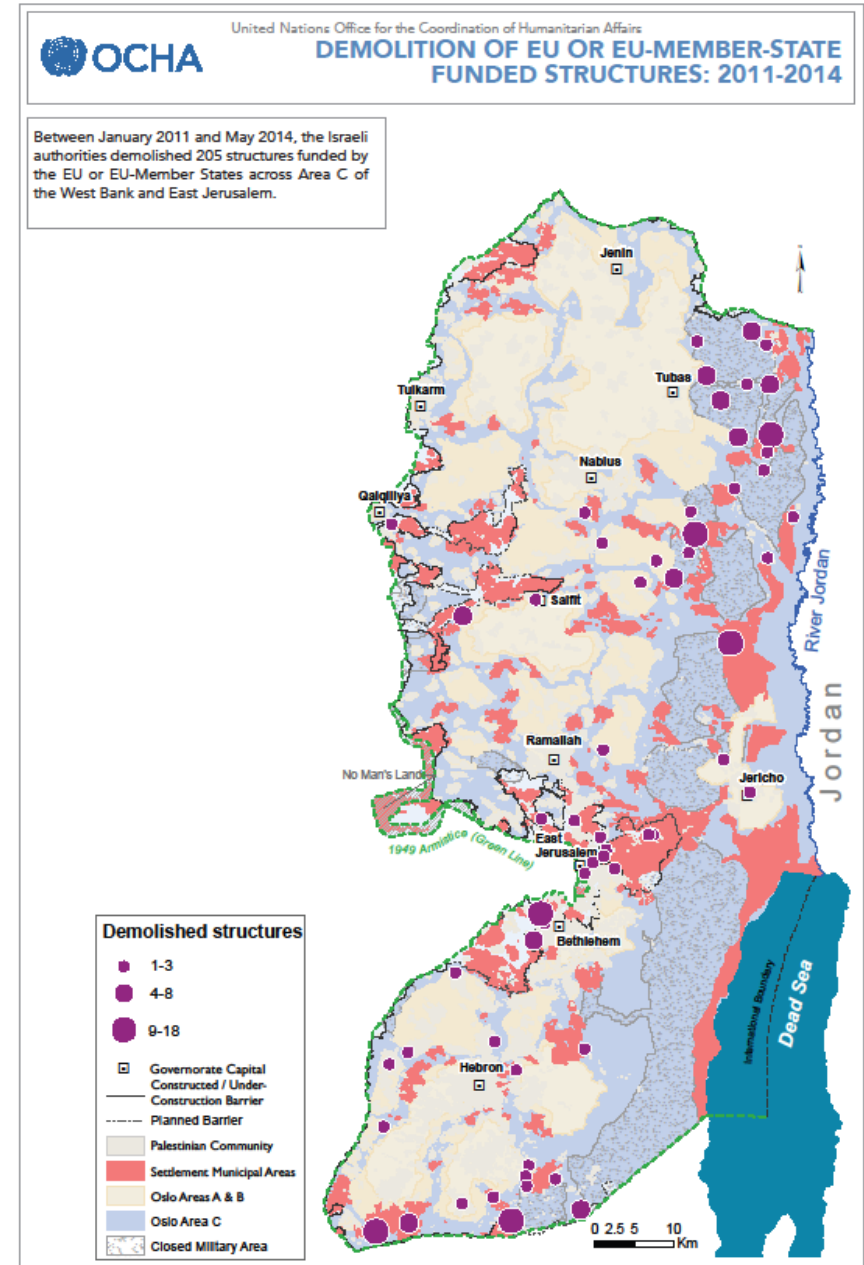
9<sup>TH</sup> ANNUAL  
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Comet-ME is an Israeli-Palestinian organization providing basic energy and clean water services to off-grid Palestinian communities using environmentally and socially sustainable methods



# Where we work?

- Area C of the West Bank
- Harsh natural and political climate
  - Edge of the desert
  - Political marginalization
- Man-made de-development
  - An ongoing attempt to move civilian population
  - Pervasive violence
  - No access to infrastructure



# Ras ein-Auja

- Just north of Jericho, in the south of the Jordan valley, is the lowest point on earth
- Community comprised of five separate clusters belonging to several different Bedouin and Fellah tribes, with 120 families in total
- Residents do not own the land on which they live, mostly refugees
- Extreme climate, temperatures can reach 50<sup>0</sup>C



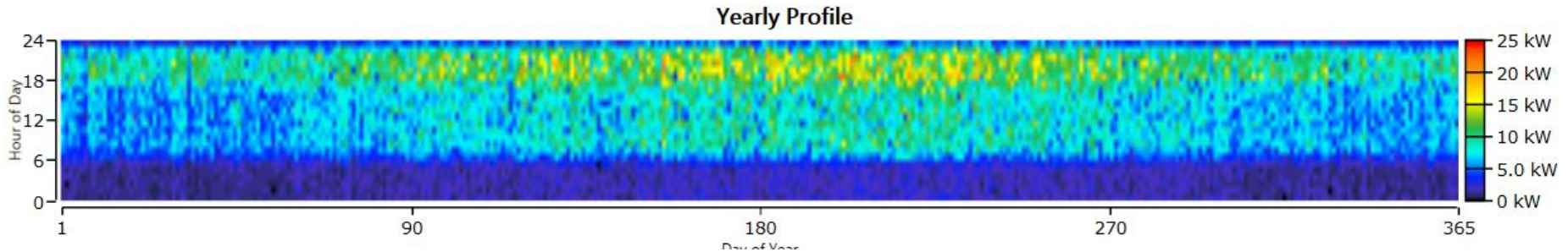


# Technical problem definition

- Island system
- Solar fraction of energy production must be above 95% for the first 8 years of the system's life
- Design life of the batteries should be at least 10 years
- Daily allocation for each family is 3.5 kWh
- Very low visible signature

# HOMER modelling

- Assumptions
  - 120 families
  - 3.5 kWh per family per day
  - 2% yearly growth in load
  - 3 load profiles were simulated, two from Comet's install base and 1 generic



# Operational principle

- Room 1 (main) – backup generator
- Room 2 - connect a line from room 1 to the AC-IN line as a generator
- Simple, SoC based, control strategy:
  1. Both rooms are above 50% SoC: each room is independent.
  2. Room 1 above 50% SoC and room 2 below 50% SoC: power flows from room 1 to room 2.
  3. Room 1 below 50% SoC and room 2 above 50% SoC: room 1 is connected to the generator and room 2 is independent.
  4. Both rooms are below 50% SoC: the generator powers the whole grid, both rooms charge the batteries from the generator.

SoC 2

>50%

>50%

	3	1	
	4	2	
	<50%	>50%	SoC 1



# Implementation

- A hybrid island solar-diesel three phase system
- Two interconnected electricity rooms
- Each room contains:
  - A 6,000 AH OPzV battery
  - 3\*8 kW two-way inverters
  - 12 charge controllers
  - Online monitoring system
  - Backup diesel generator (only on main room)
  - 60 kW solar array







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# Thank you

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