World Health Organization

سلطة الطاقة والموارد الطبيعية

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Empowered lives.
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Solar for Critical Basic Services in Gaza

Health, WASH and Education Sectors

Wednesday, 04 September 2019

Electricity Crisis

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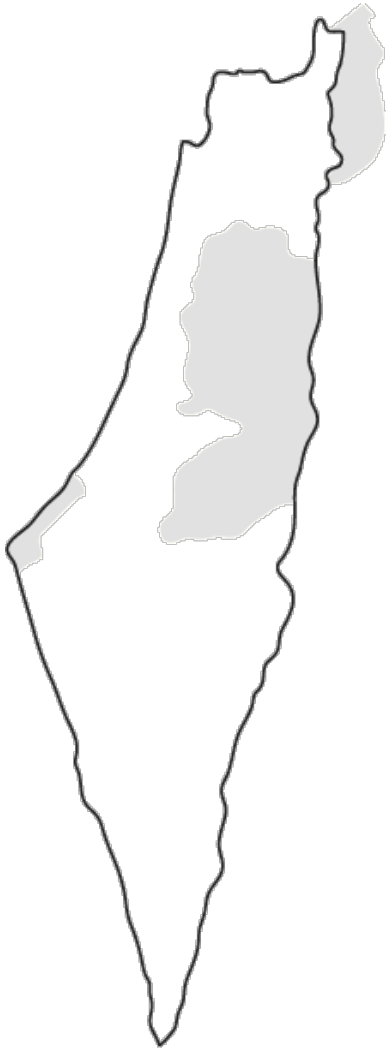
In Gaza,

Decade of Daily cutoffs

Affects provision of basic services including health, WASH, education, and solid waste management



Demand vs. Supply

450 MW of electricity is needed

Only **70-80 MW** of electricity is produced by GPP

120 MW of electricity is from Israel

GAP 250 MW

2013 - 2018

140 water desalination and sewage treatment

186 health facilities

75 solid waste facilities

Emergency Fuel
US$25 million

Stoppage of Fuel

Reduced average quota of water to 80 l/capita/day

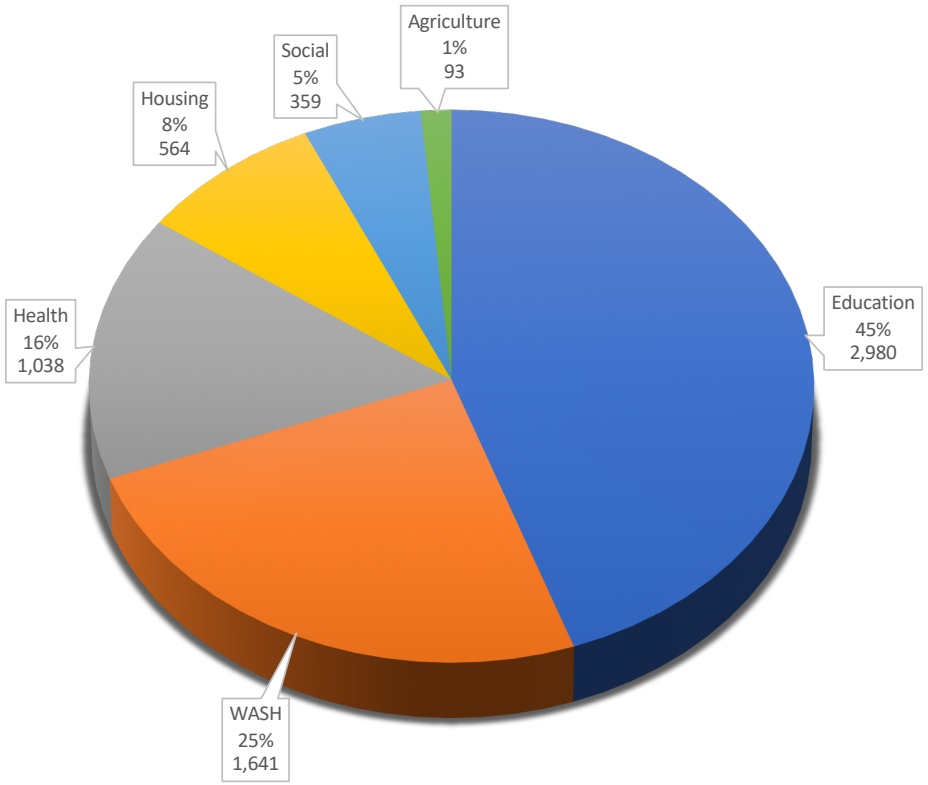
Reduced services in health facilities

Accumulated solid waste and increased health hazards

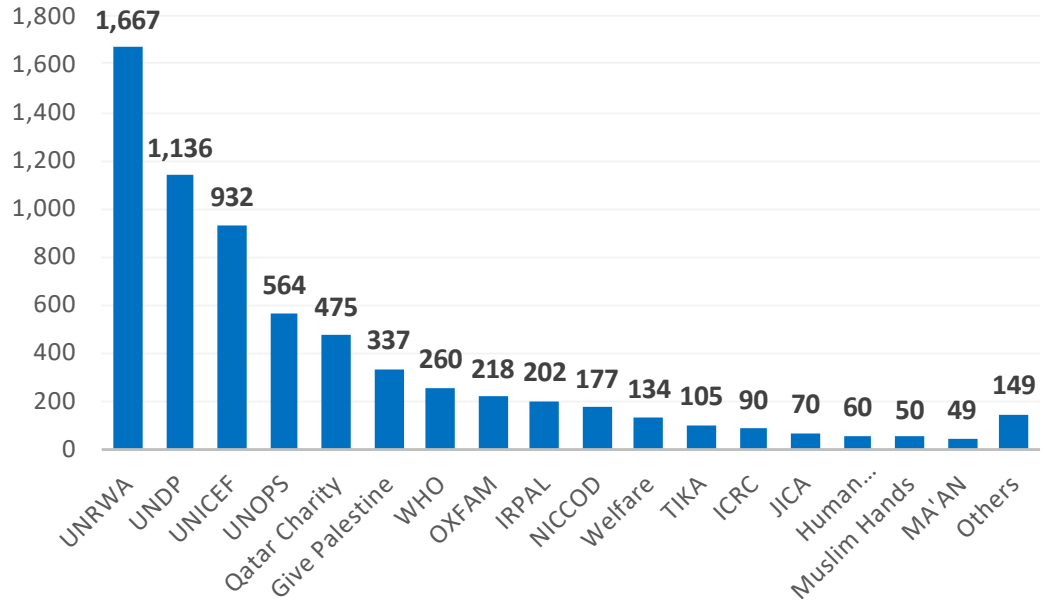
Achieved PV Solar Energy Per Sector and Agency

Mapping as of 25 August 2019

Distribution of Completed PV Solar Energy in KW by sector



Completed Interventions (kWps) by Agency



- **Others:** 11 agencies, where each agency intervention is < 30 kWp
- **Achieved kWps:** 6,675 kWp, implemented by 28 agencies
- **Ongoing KWps:** 3,311 kWp, being implemented by 14 agencies
- **Pipeline KWps:** 9,722 kWp, serving Education, Health, and Wash

Findings – Solar Assessment in Health

Scope of Assessment

- **15** Hospitals
- **51** Primary Health Centers (PHCs)
- **8** Other facilities

Current Situation

- **623KWp** is already installed in 11 hospitals
- **207KWp** is already installed in 21 PHCs

Solar Energy Potential

14 hospitals need **3.41 MWp**

51 health care facilities (primary and other) need **1.028 MWp**

Identified solar energy capacity will cover **21%** of total hospital energy needs and **65%** of PHCs' total energy needs.

Annual Savings

US$ 2.1 million for hospitals

US$ 0.5 million for PHC facilities

Financial Feasibility

US$ 4.23 million for PHCs

and

US$ 14 million for hospitals

Environmental Impact

3.37 tons

of CO_2 emissions reduced

Findings – Solar Assessment for WASH

Scope of assessment

- public desalination plants **52**
- **266** municipal domestic water wells
- water pump stations **42**
- **49** wastewater pump stations

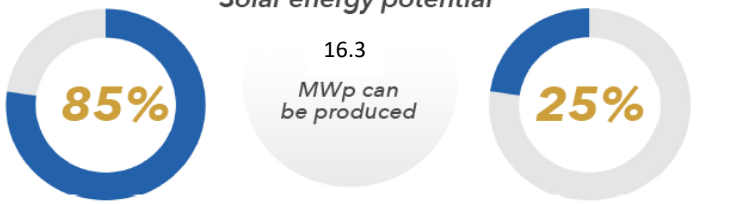
Current situation

- **129** are not feasible
- **74** Public WASH facilities are feasible for installing a PV system
- **206** are moderately feasible

Critical WASH facilities

Of the **186** critical WASH facilities, **81** technically feasible and moderately feasible for installation of solar PV systems

Solar energy potential



of power demand covered

of energy demand covered

Annual savings

US$ 6.96 million annually

Financial feasibility

US$ 9 million
for moderately feasible facilities

US$4.7 million
for feasible facilities

Environmental impact

0.284 L/kWh
Diesel generators consumption

0.76 kg of CO2/kWh
Diesel generators production

Findings – Solar Assessment for Education

Scope of assessment

291 Governmental school buildings (409 schools)

Current situation

School buildings fit for solar PV systems

41 School buildings serving

51 Schools have adequate solar systems to operate school facilities

Solar energy potential

250 School buildings serving

358 Schools need

6.053 MWp based on

25 kWp Average load for each school

100% total schools' energy needs can be covered by rooftop PV capacity and can accommodate more PV solar systems

Annual savings

US$ 1.836 million saved

Financial feasibility

US$ 22.15 million

Environmental impact

4.6 tons

of CO_2 emissions reduced

Technical Recommendations

- Best sustainable renewable energy option: Solar PV system
- Recommended module: PV hybrid system (PV, Grid, Gen set and batteries)
- Battery backup: 2-6 hours for critical loads (fewer batteries, better dollar value, less harm to environment)
- Energy efficiency measures as part of the solar system intervention
- Comprehensive training programme, clear operations and maintenance plan
- Capacity building on maintenance for local suppliers and service providers
- Technical guidance for solar PV systems (PENRA standards, lessons learnt)
- Laboratory under the management of PENRA to verify the quality of components

Issues for Consideration

- Enhance processes to ensure technical compatibility with utility network for adaptation to an on-grid system (e.g. PENRA approving the designs)
- Identify / establish a unified management mechanism to address technical issues (e.g. PENRA/JEDCO committee)
- Put into effect the net-metering agreement with GEDCO
- Ensure a sustainable investment plan is in place for any solar energy system intervention, with maintenance costs incorporated in the savings
- Assign a focal point for each location to be responsible for the operation and maintenance of PV solar system
- Establish a collaboration and coordination mechanism within Gaza among the implementers of the solar initiatives at two levels: strategic and technical
- Invest in PV systems using roof tops of public buildings (especially at schools)
- Ensure smooth approval of permits and access of materials to facilitate the transition to solar energy systems

Priority Investment Areas – Health, WASH and Education are equally Important

Health Priorities

- Hospitals with higher solar potential and large energy needs
- PHCs prioritized based on four criteria, including solar potential, service level and emergency

Total investment: US$18.23 million

WASH Priorities

- 74 WASH facilities identified as feasible for installing a PV system , 206 facilities identified as moderately feasible
- Of the 186 critical WASH facilities, 81 technically feasible and moderately feasible for installation of solar PV systems.

Total investment: US$13.7 million

Education Priorities

- School buildings with double shifts (average 1,255 students served per day)
- Secondary schools where computer classes and labs are mandatory

Total investment: US$22.15 million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Thank you