



2015 Annual Report





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Comet-ME is an Israeli-Palestinian organization providing basic energy and clean-water services to off-grid communities using environmentally and socially sustainable methods. We facilitate the social and economic empowerment of some of the poorest and most marginalized communities in the occupied Palestinian territories through the installation of renewable wind and solar energy systems, provision of clean water services, capacity building, and reliable maintenance.

Our work has developed out of a long-lasting relationship with and commitment to the marginalized Palestinian communities in the south Hebron hills. Initially a voluntary initiative, Comet-ME carried out its first installations in 2006 and formally incorporated in Israel as a public benefit company in September 2009. Today, we are a vertically integrated utility, providing basic energy services to 28 communities encompassing nearly 2,500 people. In 2013 we entered the field of off-grid water pumping and filtration solutions, and since then have brought our clean-water services to households throughout our energy install base. Comet-ME is currently the leading provider of sustainable rural electrification services in the region, and an innovator in the field of off-grid water technologies.

Over nearly a decade of experience in the field, we have seen how the provision of basic energy and water services to the marginalized communities of the south Hebron hills has proven to be an effective means for community empowerment and economic development, allowing communities to choose their own paths and adapting our services to their evolving needs. Since the establishment of Comet-ME’s Center for Appropriate Technologies in the south Hebron hills in 2012, Comet-ME has been a daily presence in the lives of the beneficiary communities, responding to any issue—technical or social—that arises, and in this way establishing ourselves as a reliable and trustworthy service provider in the region.



Who We Are

Founders and Directors

Elad Orian, General Manager
Noam Dotan, Technical Manager

Energy project manager

Ahmad Almasry

Water project manager

Abd Aljawad Qabajah

Maintenance manager

Waseem Aljabari

Technicians

Jalal al-Tamimi
Moatasem Hadalin
Muhammad Aqeel

Community liaison

Ezra Nawi

Water lab technician

Ahmad Sayareh

Organizational development manager

Tamar Cohen

Financial management

Basheer Abu Baker, CPA

Board of directors

Dr. Dan Rabinowitz
Dr. Danielle Shani
Libby Lenkinsi
Dr. Michal Givoni
Aya Shoshan

Oversight committee

Yossi Mosel
Dr. Yoav Lehahn

Photo: Tomer Appelbaum

Where We Work

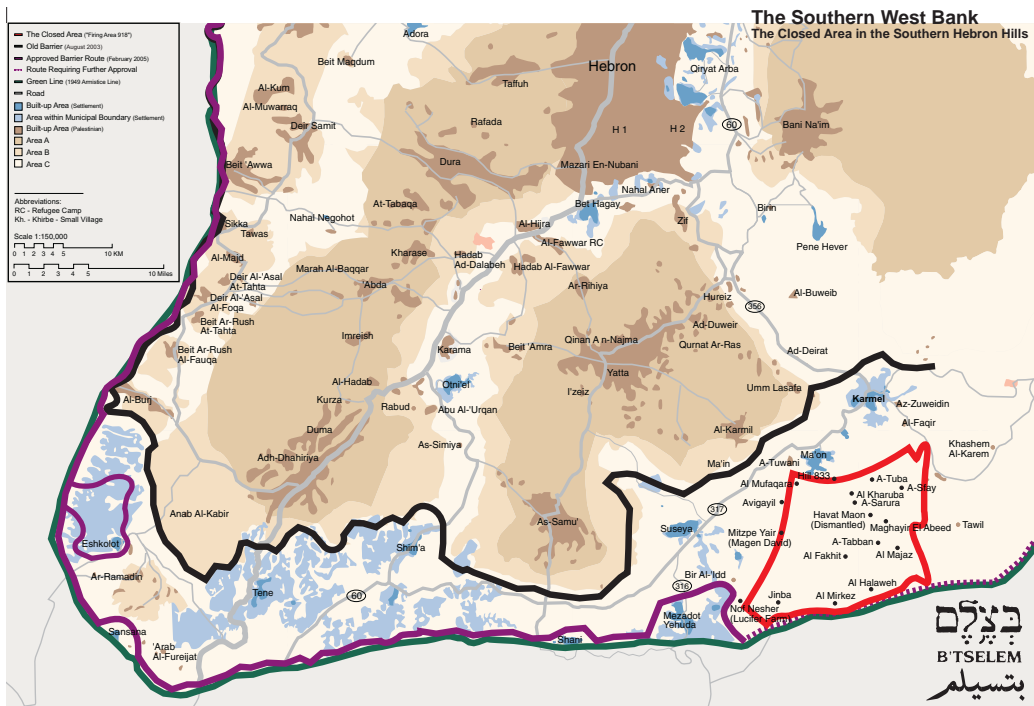
We work in the south Hebron hills region of the West Bank, home to several thousand Palestinian farmers and shepherds living in caves and tents. Often referred to as the “cave-dwellers,” the people in these communities subsist on non-mechanized agriculture and herding. Life in this semi-arid region (with an average annual rainfall of less than 250mm), and constant exposure to the elements makes day-to-day life a matter of sheer survival.

Making life even more difficult is the Israeli occupation. Most of the south Hebron hills region is defined as Area C under the Israeli-Palestinian Interim Agreement, meaning that it is under full Israeli military and civil control. Area C constitutes 62% of the West Bank and is the only remaining land and

agricultural reserves for a viable future Palestinian state and economy. The planning regime imposed by Israel in Area C severely discriminates against the Palestinian population: Jewish settlements—all of which are considered illegal under international law and some even by the Israeli government—enjoy electricity, running water, sewerage systems, and access roads. Palestinian communities that have lived on their lands for generations and generations, on the other hand, are denied these basic services

and live under the constant threat of demolitions and forced displacement.

The poverty and marginalization of these communities is thus a product of the political situation more than of geography, climate, or the economy. Our work is motivated by the desire to ease the lives and increase the resilience of communities afflicted by conflict and political violence.



The Israeli settler outpost of Mitzpe Yair, considered illegal even by Israeli standards, is fully connected to the Israeli electricity and water grids.



Photo: Tomer Appelbaum

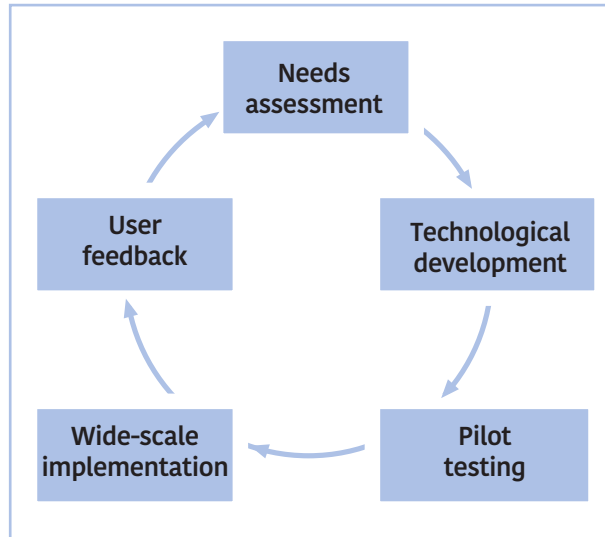
How We Work

In the bottom-up tradition and spirit of appropriate technology, we espouse a dynamic, needs-driven approach to our technological developments and applications. We have dedicated a great deal of thought and effort to developing our technical and social model over the years, based on user feedback and lessons learned in the field.

We recognize that in highly technological projects such as ours, knowledge dissemination is an integral part of community empowerment. We therefore base our work on the following core principles:

Open source

All technological details of our systems are available in the public domain. Sharing our experience with and benefiting from that of global partners such as Wind Empowerment Association, the Centre for Affordable Water and Sanitation Technology, the UN Sustainable Energy for All Practitioner Network, and Engineers Without Borders, Comet-ME is part of a uniquely short loop of technological development and implementation. Lessons learned in the south Hebron hills can serve communities in Africa; developments made in student labs in the US can find their way to the field within weeks.



Local sourcing

Comet-ME procures inputs from local manufacturers whenever possible. Most of the installation materials are purchased from suppliers in Yatta, Hebron, and Ramallah. Building the wind turbines ourselves is a central aspect of our work. By developing the knowledge and practice in the field of renewable energy we invest in local tech infrastructure.

Community

Community participation and trust-building is an integral part of our approach. We invest in building a direct and long-term relationship with the community members, whom we consider both beneficiaries and partners. Our work model is based on substantial and meaningful community participation, ownership, training, and capacity-building at every stage of the process. Our team of Palestinian and Israeli engineers, project managers, and technicians trains local community members in basic maintenance and diagnostics, helping to develop a local knowledge base that serves as a source for future development.





Building Capacity

Each of the communities has a community supervisor who is responsible for the routine upkeep of the energy systems and is the point person for Comet-ME's professional maintenance team. Family members, school directors, and teachers are trained in the proper usage of household water systems and water filters in order to maintain high water quality.



Photo: Guy Butavia



Photo: Max Epstein

Last autumn, we stepped out of our usual frame of mind to do something wildly original and refreshing. The WILD KIDS Animation Studio from Jerusalem joined us in Tuba to conduct a 3-day stop-motion animation workshop for kids and adults. Depicting the landscape of their lives through drawing (small and large format), painting, and objects from real life, young and old alike exercised their artistic creativity and took part in the creation of their village's [first animated film ever](#). Thanks to Max Epstein and Vasyl Sribny of WILD KIDS, Hannan Abu Hussein, and the Awad and Abu Jundiya families for their creative energies and hospitality.



Photo: Guy Butavia



Photo: Max Epstein

Photos by Comet-ME, Max Epstein (top right, bottom right)



Total Install Base 2015

28

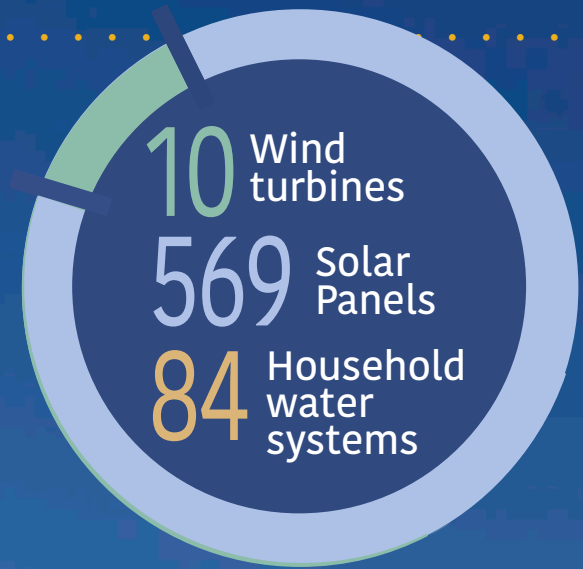
Communities

2,500

Beneficiaries

4

Schools

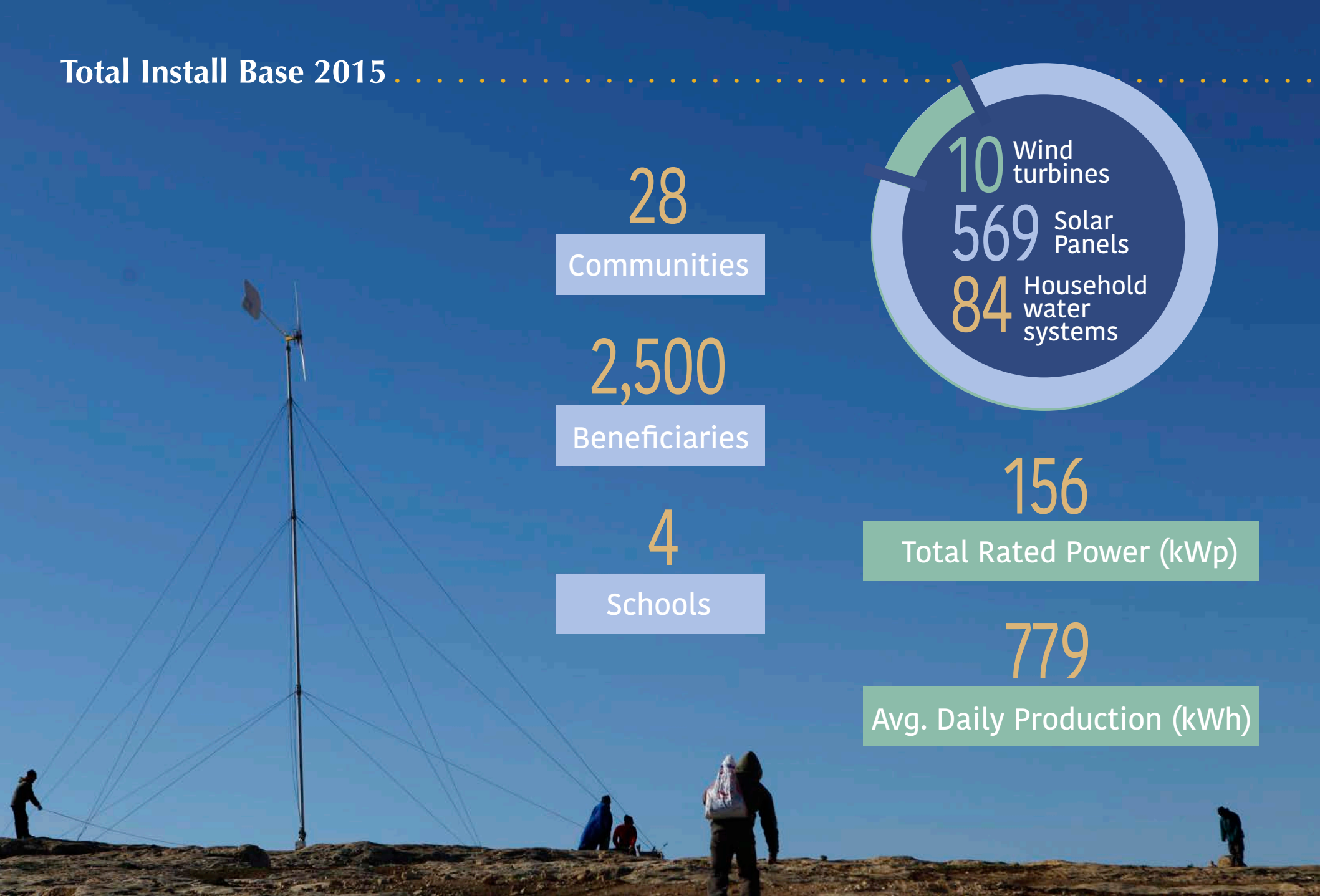


156

Total Rated Power (kWp)

779

Avg. Daily Production (kWh)





2015 Activities Review

COMET-ME ENERGY PROGRAM

Lack of reliable access to electricity is a major hindrance to development in the south Hebron hills and makes day-to-day survival a difficult task. Lack of refrigeration, be it of food, water, or medication, particularly in the hot summer months, requires frequent trips to town to buy food and receive medication. Basic activities such as doing laundry, finishing homework after dark, and even cell-phone charging, cannot be taken for granted. Moreover, the production of dairy products, a backbone of the local economy, requires hours of manual labor, in particular on the part of women. Those who do have some access to electricity via diesel generators, can spend hundreds of shekels a month for just a few hours a day of electricity, while suffering from air and noise pollution next to their homes.

The implementation of Comet-ME's off-grid energy solutions in the communities over the past nearly a decade has had manifold humanitarian, economic, and social benefits, while contributing to the resilience of the communities in the face of the harsh political reality. Those who experience the change in the most palpable and meaningful way are the women, who traditionally bear the brunt of the manual labor involved in the day-to-day tasks of maintaining the household and its economy—from carrying water, cleaning, cooking, and doing the laundry, to milking and producing dairy products for family consumption and sale.



For many families, this past winter was the first dairy season in which they had access to electric butter churns—not only increasing the yield per liter of milk and improving socio-economic potential, but vastly reducing the amount of manual labor traditionally dedicated by women to the task of producing the dairy products.

Energy Installations

In 2015, Comet-ME resumed energy installations, installing renewable energy systems for 72 families in nine different communities and bringing our total energy install base in the south Hebron hills to nearly 2500 people in 28 communities throughout the area. These families now receive basic energy services (2-2.5 kWh/day/family)—enough for basic lighting, refrigeration, access to electrical appliances such as butter churns and washing machines, telecommunications, and water pumping.

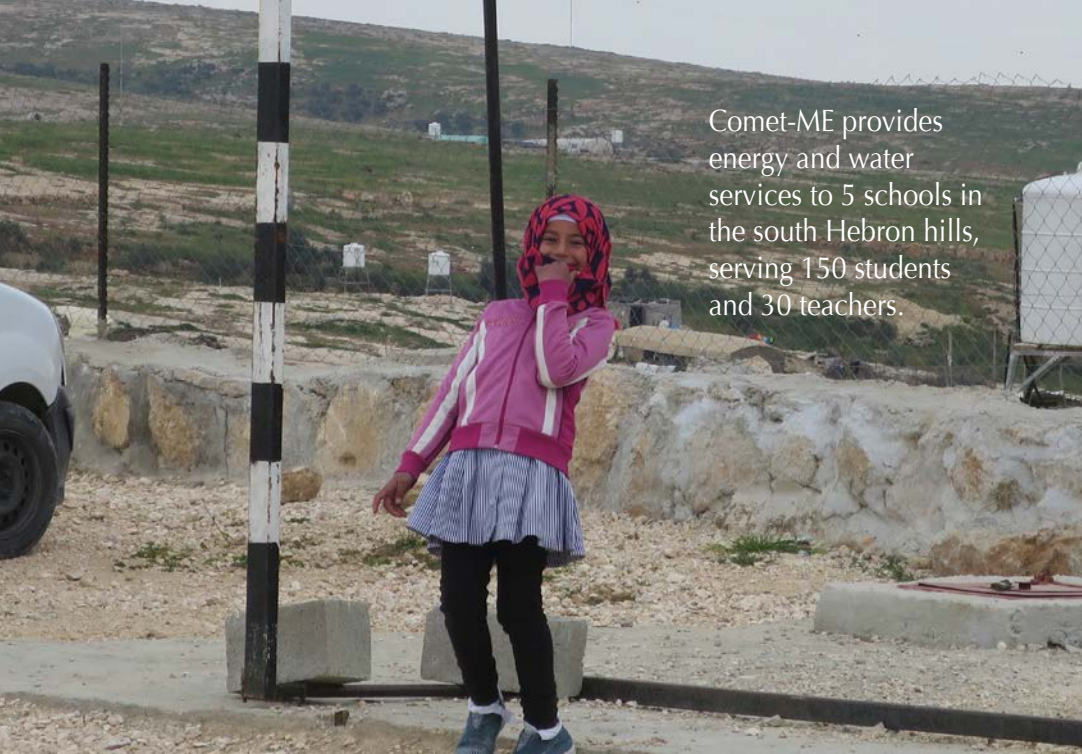
Comet-ME's 2015 energy installations were funded by the European Union Partnership for Peace Programme and by the Ministry of Foreign Affairs of the Netherlands.



Ministry of Foreign Affairs of the Netherlands



Installations // Left and middle right: Tomer Appelbaum, Top and bottom right: Comet-ME



Comet-ME provides energy and water services to 5 schools in the south Hebron hills, serving 150 students and 30 teachers.

Maintenance and upgrades

Regular maintenance and upkeep of our systems is a central component of Comet-ME's methodology. Our maintenance team is responsible for overseeing routine maintenance and conducting regular safety checks, monitoring and evaluation to ensure that the energy services Comet-ME provides match the needs of the communities. The team makes field visits, responds to emergency system failures, educates community members about proper use and upkeep of the systems and basic diagnostics, implements upgrade work, and collects bi-monthly payments for the maintenance savings fund.

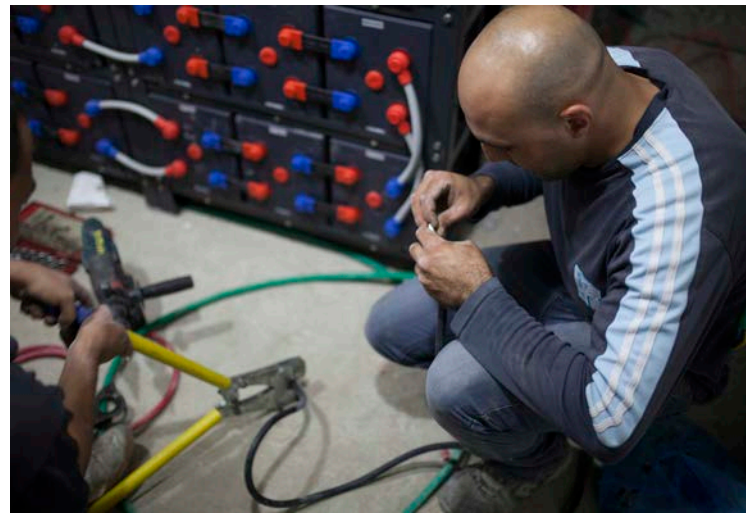
This year we implemented system upgrades in three communities, adding solar panels, augmenting battery capacity, and upgrading electronics. We extended our existing mini-grids to 36 new structures throughout our install base in the south Hebron hills, including two new elementary schools.



Top and middle right: Turbine maintenance, bottom right: System upgrade // Comet-ME



Photo: Comet-ME



Photos: Tomer Appelbaum





Photos: Tomer Appelbaum



COMET-H2O: WATER PROGRAM

Water is one of the most acute problems facing the off-grid, rural communities in the occupied Palestinian territories. The communities residing in the south Hebron hills rely on rainwater harvesting and cistern storage for water supply. Families subsist on as little as 20 liters of water per capita per day—as opposed to an average of 73 liters per person per day in the Palestinian Authority and 183 liters per person per day in Israel. Many families exhaust their water supply early in the summer and need to purchase water in tanks and transport it to their dwellings. Moreover, family cisterns in the south Hebron hills are not equipped with mechanized pumping capacity, and water is drawn and carried manually, much of this burden falling upon the women. In addition to the problem of insufficient annual water quantity and distribution methods, the quality of the water collected in the cisterns is very low and often unsafe for human consumption. The state of health, especially children's health, in these communities is directly affected by the poor quality of the drinking water.

Comet-ME's water pumping, distribution, and filtration systems provide a household-level water solution that greatly reduces the amount of time and labor dedicated to household water management and vastly improves the quality of drinking water. The systems are simple to use and maintain, building upon and improving, without seeking to override traditional family water-management practices in SHH.

Comet-ME's water program for 2015 was supported by the Ministry of Foreign Affairs of the Netherlands, Irish Aid, and the Swedish Postcode Lottery Foundation.





Our distinctive white tanks have become part of the scenery.



Installation of taps for watering the herds in their pens and away from the cisterns, reduces contamination of the cisterns from animal droppings.



Distribution of water in pipes reduces exposure to the open air and warmer temperatures and thus inhibits the growth of microbiology.



The slow-sand filter provides clean drinking water for human consumption.



Distribution of water to taps in and around the home provides convenient access to water and saves hours of physical labor.

Photos: Tomer Appelbaum

Water installations

Comet-ME's water pumping, distribution and filtration systems help fulfill the basic need for safe drinking water. A mechanical pump is operated automatically using excess energy from the community's renewable-energy grid. Water is pumped from rainwater cisterns through a set of 55- and 25-micron pre-filters into a tank and then distributed to taps in and around the home for human and herd consumption, with one tap in each home equipped with a slow-sand (or bio-sand) filter. Adapted by Comet-ME from an open-source design by [CAWST – the Center for Affordable Water Sanitation Technologies](#), the slow-sand filter (SSF) is capable of providing drinking water that meets WHO standards.

In 2015, Comet-ME's water team installed water systems for 62 households in 13 different communities, bringing our total number of water systems to 84 throughout our energy install base.



Water augmentation

This year we conducted our first water augmentation project, in two communities in our energy install base. The project entailed the construction of six rainwater cisterns, providing a total of 1,130 cubic meters additional water-storage capacity to ten different families in the two communities (an average of more than 100% increase in water-storage capacity per family). The project has had a great impact for its beneficiaries – increasing water independence by reducing the time, labor, and costs associated with household water management. All of these things contribute meaningfully to the overall stability, security, and steadfastness of two at-risk Palestinian communities in the south Hebron hills region of Area C.

Water-quality monitoring

Close monitoring and water testing, along with regular cleaning and maintenance of the filters, water containers, and tubes, is essential for maintaining high water quality. Comet-ME's water-quality monitoring scheme is an integral part of our water program and has several components:

- Instruction of users in basic upkeep of slow-sand filters and the importance of keeping water containers and tubes clean. Regular follow-up to the initial training sessions is conducted by our water lab technician on his periodic visits to each of the communities.

- Regular sampling and testing by Comet-ME's water lab technician on a rotating basis between communities; production of weekly reports to observe the adjustment of the SSFs to changes in water-quality input (such as following rainfall) and to determine whether localized treatment of the water is necessary.

- Localized treatment of drinking water in instances in which microbiological contamination is observed in the drinking water.

Read a report on Comet-ME's water-quality monitoring work on the [DelAgua water blog](#).





Unloading materials at the Center

COMET-ME CENTER FOR APPROPRIATE TECHNOLOGIES

Comet-ME's Center for Appropriate Technologies in the south Hebron hills, inaugurated in December 2012, is the only Palestinian-Israeli technological center with expertise in renewable energy and sustainable development in Palestine. Located in a renovated structure in one of our communities, the Center is designed based on ecological and sustainable principles and runs exclusively on green energy and self-collected rainwater. The Center serves as our regional base of operations for maintenance and installations activities, R&D for new rural development technologies, workshop and warehouse, training center for staff, community supervisors, and guests, and a place for meetings and collaborations with other NGOs working in the region.





Top left:
Weekly testing of drinking-water
samples in our microbiology lab

Right:
Sifting sand for the slow-sand filters

Bottom left:
Pilot testing the family-based solar
energy systems in our workshop



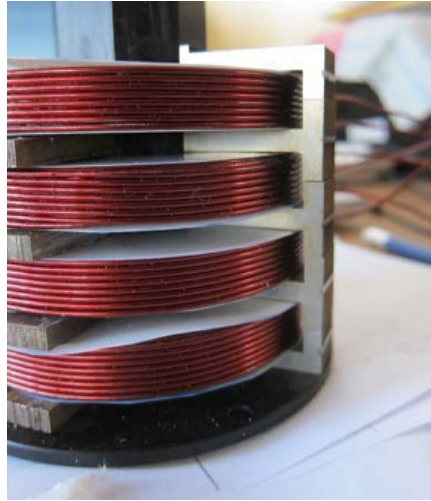
Top left: International volunteers field-testing the solar pump
 Right: Breaking for lunch
 Bottom left: Hosting a meeting in the big cave

The operational costs for the Comet-ME Center are supported by project funding and by generous core funding from the Rockefeller Brothers Fund, USA and the Swiss Olive Oil Campaign.



RESEARCH AND DEVELOPMENT

Developing Rural Off-Grid Pumping Technologies



As an organization that is both highly technological and field-based, we are located in a unique position that allows us to integrate real needs with technology's promising possibilities. Many high-tech solutions currently produced in sophisticated overseas labs and factories fail to achieve large-scale adoption in developing areas because of the great distance (both geographical and mental) between them and the implementing area. Our goal is to bridge this gap by developing appropriate technologies that are suitable to the capacities, resources, and needs of off-grid communities in developing areas.

In 2015, we focused our R&D in off-grid pumping technologies on the development of a solar-powered magnetic piston pump targeting smallholder farmers in the developing world, which can be manufactured at low cost, using simple materials, and handled and maintained with relative ease by the end-user. This year, we have gone from proof-of-concept and feasibility studies to prototyping and alpha-site testing. We continue to advance and improve the design as we seek partners for pilot testing of the commercialized design.

Comet-ME's R&D for 2015 was supported by the Osprey Foundation, USA, and by the Ministry of Foreign Affairs of the Netherlands.



LEGAL ADVOCACY

The threat of demolition is the most significant obstacle to rural development in the West Bank, including rural electrification and water projects such as Comet-ME's. While lack of permitting is couched by the Israeli authorities in ostensibly technical-planning terms, in truth the issue is a purely political one, whose goal is to push Palestinians living in the predominantly rural areas in Area C closer to population centers in Areas B and A.

Since 2012, Comet-ME has been fighting the threat of demolition to its systems. Out of our installations in 28 communities, 16 are currently under concrete legal threat. More than 1,000 people depend on these systems for livelihood, lighting, and refrigeration. Through intensive legal and diplomatic efforts, we have been able to forestall the demolitions of our systems.

"The electricity system is a humanitarian relief object. The provision of electricity is necessary for the survival of the civilian population. Therefore, the installation is protected under international law and its demolition is prohibited." Attorney Michael Sfard in a petition to Israel's High Court of Justice.

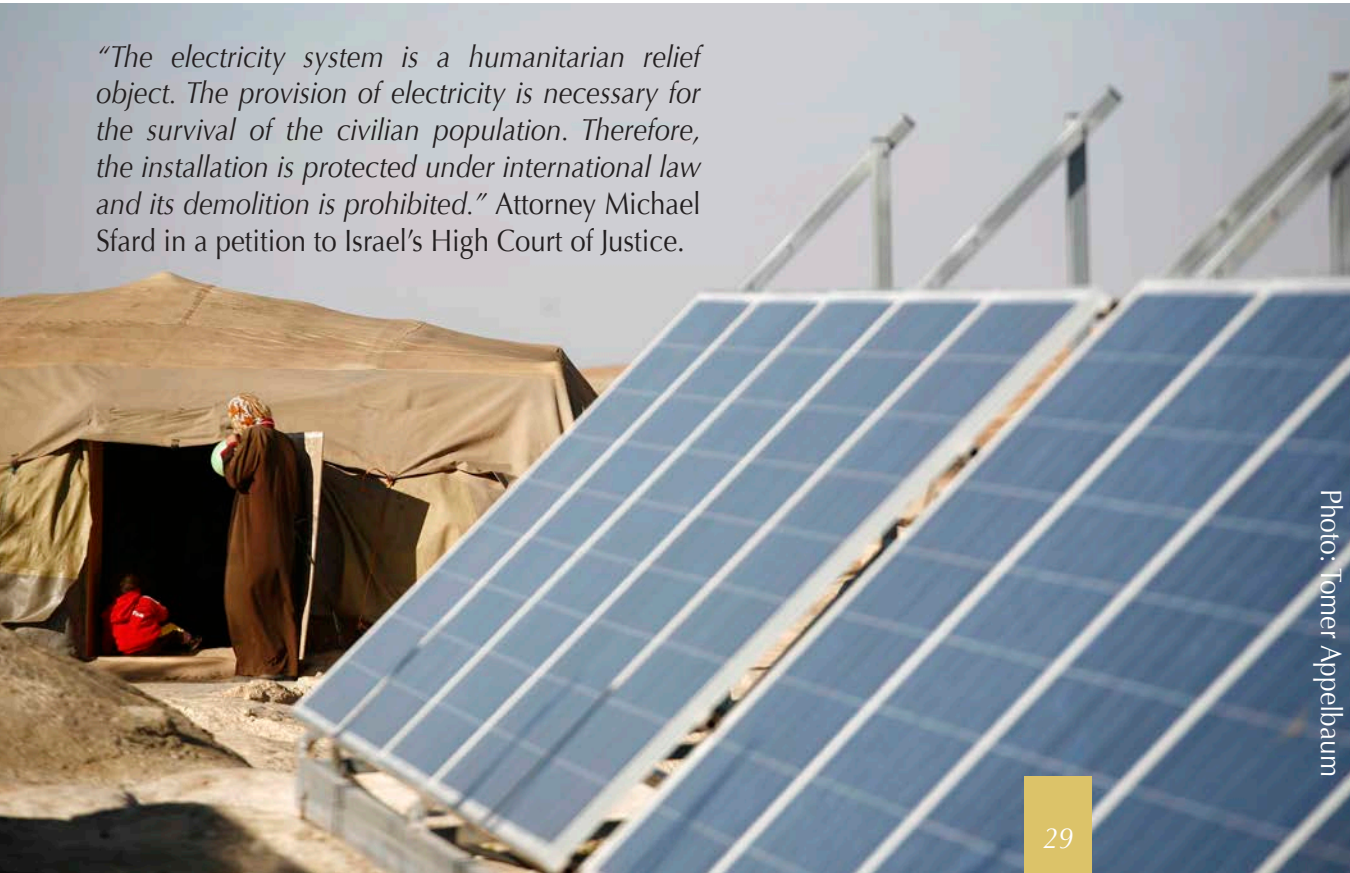


Photo: Tomer Appelbaum

Comt-ME in the media

This year, our renewable energy work in the South Hebron Hills has captured the imagination of writers and photographers from around the world and has been covered from many different angles—humanitarian development, environment, technology, and politics—both in the print media and online. Click [here](#) to read the coverage of Comet-ME in the media.

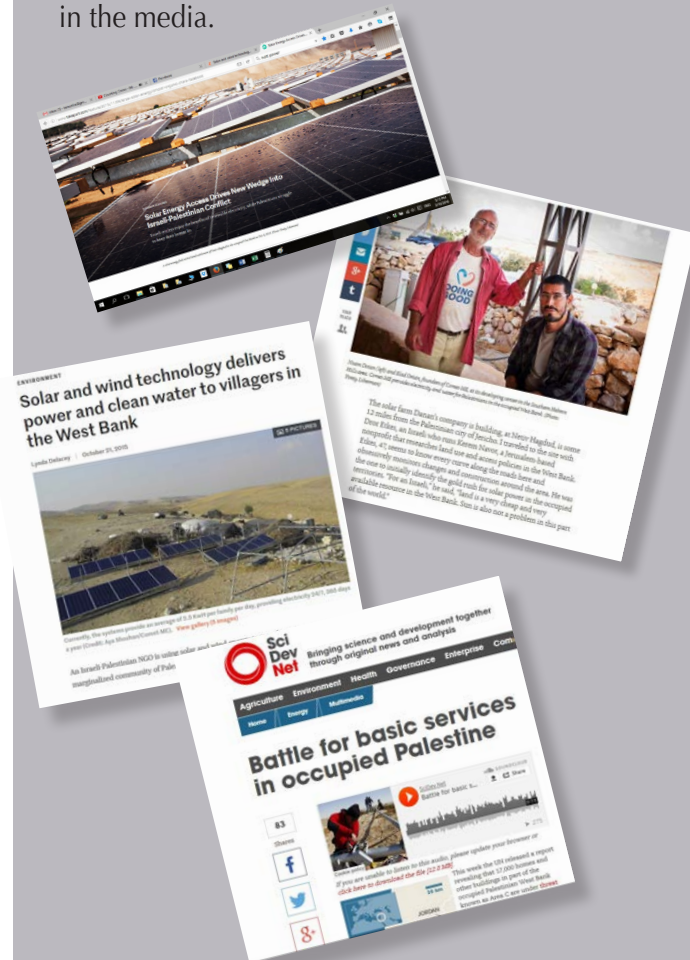




Photo by Max Epstein

Looking Ahead.....

Comet-ME's plans for 2016 focus on three core activities: energy, water, and solar-pump development. In our energy and water programs, we are expanding our integrated off-grid energy-and-water package to 100 new families in the south Hebron hills and beyond, while continuing to provide reliable maintenance services to all the communities in our install base.

In our pump-development program, we continue to advance and improve the design of our solar magnetic piston pump, while seeking partnerships throughout the developing world to begin beta-site testing in the second half of 2016.

Thank You



Comet-ME is grateful for all the local and international donors, partners, research institutions and individuals who have made our work possible through support, advice, and collaboration.

Donors

European Union Partnership for Peace Programme
French Ministry of Foreign Affairs
German Foreign ministry
Irish Aid
Netherlands Ministry of Foreign Affairs
Osprey Foundation
Rockefeller Brothers Foundation
Swedish Postcode Lottery Foundation
Swiss Olive Oil Campaign

And to all the individual donors who have supported our work and placed their trust in us.

Special thanks to our US-based fiscal sponsor, the Center for Emerging Futures

Sharing Knowledge

CAWST – Centre for Affordable Water and Sanitation Technology
Clinton Global Initiative
DelAgua Group
Hugh Piggott and Scoraig Wind
Wind Empowerment Association

Sharing the Challenge

Association for Civil Rights in Israel
Bimkom – Planners for Planning Rights
Breaking the Silence
Ecumenical Accompaniment Programme in Palestine and Israel (EAPPI)
Popular Struggle Coordination Committees
Rabbis for Human Rights, Israel
Ta'ayush
UN-Habitat
Wild Kids Animation Studio

Get Involved



Our work is made possible through the generous donations of friends and supporters. Please consider supporting our work by making a [donation](#)

Comet-ME is always looking for supporters, partners and volunteers. Please get in touch at info@comet-me.org
For more information visit our website www.comet-me.org

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or on twitter [@CometMe](#)