

# Deployable – Renewable Energy Power System Demonstrations at Fort Irwin

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For some time, the National Training Center's Operations Group at Fort Irwin, Calif., has been investigating alternatives to diesel generators, which are currently used extensively throughout the various NTC training facilities. These training ranges are far from the actual cantonment area and are located in the middle of inhospitable terrain, with summertime temperatures near 120°F.

One of Fort Irwin's local utility providers, Southern California Edison, estimated that it would cost about \$1million/mile for extending power distribution lines.

utility rates in the country, at well over \$0.14/kilowatt-hour.

With funding provided by the Assistant Chief of Staff for Installation Management's fiscal year 2008 Installation Technology Transition Program, researchers at the Engineer Research and Development Center and NTC Operations Group staff wanted to explore a hybrid renewable energy alternative. They contracted the services of a systems integrator, SkyBuilt Power, to develop and demonstrate two Deployable – Renewable Energy Power System designs. Initially, the D-REPS

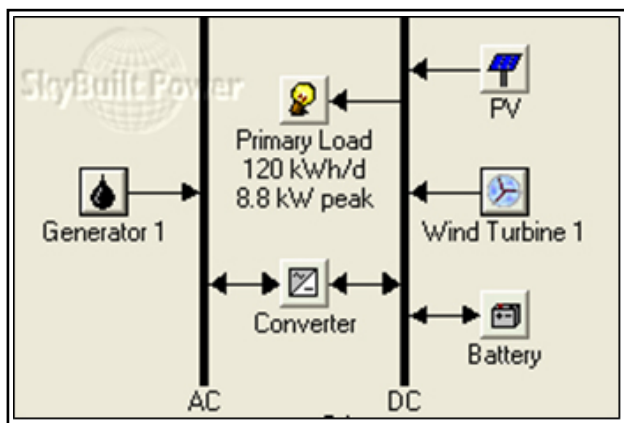
were to be used at NTC's Forward Operating Base Miami. This off-grid power solution uses the ample supply of the Mojave Desert's solar radiation and high winds to produce electricity and minimize the use of a backup fossil fuel generator.

peak of solar array, 80 deep cycle batteries at (totaling 1000 amp-hours), two 900-watt wind turbines, two 3.5-kW inverters, and a back-up 8-kW propane generator. One of the D-REPS was designed to fit inside an easily transportable, standard 20-foot shipping container and the other was trailer-mounted. Both units were up, operational, and providing performance data by summer 2008.

In spring 2009, the shipping container D-REPS was moved from FOB Miami to an area called Moose Gardens. To date, the propane generators have only been brought online for testing procedures, with the solar array and wind turbines as the only sources for maintaining the charge on the battery bank, which ultimately provides power to the loads through the inverters.

## Advantages

The D-REPS demonstration at NTC Fort Irwin is a major step forward in the Army's effort to both reduce fuel consumption and minimize fossil-fuel emissions. Army studies show that technology transfer from fossil-fuel to renewable energy is necessary and an optimal choice for various missions such as communications, instrumentation, weather monitoring, target



Schematic of the Deployable - Renewable Energy Power System. Graphic courtesy of SkyBuilt Power.

Calculating a minimum of 60 miles, the cost for a utility-based option would be roughly \$60 million, with no long-term cost savings. Southern California's San Bernardino County, where Fort Irwin is located, already has one of the highest electric

## Demonstration

D-REPS are designed to provide up to 7 kilowatts of power for various Army tactical electrical loads, which are included in the NTC training mission. Each D-REPS includes 5 kilowatts-

operations, environmental emission monitoring, training missions on urban terrain at FOBs, range safety, and others.

D-REPS can also mitigate lawsuits against the Army where environmental monitoring shows a post to be in violation of air quality standards in counties

such as San Bernardino, where Fort Irwin is located. When compared to the cost of grid-tied power solutions for remote locations, D-REPS not only provides the right power, but also does it in a more cost-effective manner.

Perhaps the most compelling rationale for the continued de-

velopment and expanded use of the D-REPS capability is force protection. Use of these systems in theater means reduced diesel fuel consumption, fewer fuel convoys that are one of the most vulnerable tactical activities in the battle space and, as a result, fewer casualties.