Renewable Energy to Support our Military and Troops, Cut Costs, and Better Accomplish the Mission

David J. Muchow, Pres. and CEO, SkyBuilt Power
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Overview

- **Focus** - Renewable energy for military deployed forces
  - Saving lives, fuel, cutting operating costs and better accomplishing the mission
- Looking at National Security from a different angle
- Challenges for the Military
- Opportunities using renewables
- Examples of products and uses
The Challenges

- Renewable Energy and National Security
  - Energy choices don’t just impact usual topics of imported oil and balance of trade/payments
  - They directly impact national security operations and expenses, etc. for military, DHS, and intelligence community

- For example: military needs:
  - More rapid response world wide – mobile, light weight solutions
  - More teeth (point of spear), less tail (logistics)
  - Avoid the “the tether of fuel..” Maj. Gen. Zilmer, USMC
  - Save Lives from IEDs – fuel convoys are key targets -
    - For every 24 fuel convoys, one US soldier dies or is injured.
The Challenges

Fuel Supply Convoy Example – Logistics Nightmare
The Challenges

Conventional, Deployable Power Systems

- Conventional, deployable power systems, such as fossil fuel generators
  - Require constant refueling
  - Can be unreliable and require constant maintenance and spare parts, distracting soldiers from their mission;
  - Are noisy, give off a heat signature and can give away the position of our forces;
  - Are often oversized for the power output required and are inefficiently utilized;
  - Require fuel storage/depots - a target
  - Pollute the environment.
The Opportunities – Use more Renewables

- Renewables are a great “Hearts and Minds” leave behind for Sustainable Economic Development – simpler, less expensive to operate

- Major Opportunity: Cut costs by using more renewables
  - DoD – largest consumer of energy in US
    - In 2006 - $13.6B, 110 million bbls. of oil (300,000/d)
    - Est. $14/gal. to run a generator in the field (fuel + maintenance at that site)
      - Afghanistan Fuel 2010 - 375 million gallons
      - Iraq Fuel 2010 - 410 million gallons
    - If fuel supplied by air, not ground - $50 - $100 or more/gal. delivered
Maybe there’s a better idea…

“I knew the woodpeckers were a mistake.”

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The Opportunities – Use more Renewables

- Power without fuel – reduce your fuel convoy and resupply requirements
- Rapidly-deployable
- Extremely reliable
- Virtually no maintenance – more tooth, less tail – more focus on the mission
- Mobile – air, rail, road, sea
- “Plug-and-Play” – Modular & scalable to meet varying power requirements
- May incorporate multiple input sources – solar + wind + micro-hydro + back-up generator, etc.
- Rugged – operate in any climate
- Micro-grid compatible
- Proven, commercial-off-the-shelf (COTS) components
Renewables Cost Savings

- Renewable energy systems lower operating & maintenance costs
  - Reduce or eliminate the cost of fuel and remote or grid power
  - Virtually no maintenance when compared to generator based systems
  - Fewer maintenance trips

- Systems have been cited in the Defense Science Board Report, “More Fight – Less Fuel,” as paying for themselves in a few years, and have been saving up to 97% on generator run-time in the field for years.

- Capital + operating costs can be recovered, turning a power cost center into free energy
Examples using Renewables for Deployed Forces

- Microgrids
  - Lockheed – SkyBuilt, Rapidly Deployable Air Field
- Containerized Systems
- Trailers
- Skids
- Soldier Portable Systems
The U.S. Air Force’s Basic Expeditionary Airfield Resources (BEAR) program equips forces with lightweight, air-transportable assets used to establish mobile air bases. To improve the reliability of power to critical systems, increase the efficiency of generation to reduce costs, and enhance security by reducing reliance on fuel convoys, Lockheed Martin is providing the Integrated Smart BEAR Power System (ISBPS). The ISBPS is a rapidly deployable intelligent power system integrating a variety of energy sources, including renewables, into the existing BEAR power grid.
Containerized Power, Tactical Ops Centers, communications, base load, backup power, etc.

SkyBuilt’s SkyStation at a remote installation. Figure is for illustrative purposes only. Actual equipment and system configuration may vary.
Containerized Power – Shelters

Solar + wind + batteries, 5+ years with no maintenance or fuel – Modular, expandable, fast deployment

SkyStation™ Power components may ship inside the shelter or separately and may be deployed quickly once on site.
Shelter Systems
Pre-Fabricated, Shelter-Based Systems for Telecom, Ops Centers, Baseload and Backup Power – saving 95%+ on fuel

- Pre-fabricated shelter and renewable energy power system in a rugged package.
- Fully automatic power – solar + wind + back up batteries.
- Options: generator, remote control, customer reporting, maintenance and service, etc.
- Secure, climate-controlled space for operations center, communications headquarters, equipment shelter, etc.
- US Army certified – years of field deployment


Figure is for illustrative purposes only. Actual equipment and system configuration may vary.
Skid Based Systems
Transportable, Skid-Based Power System

- Self-contained, fully automatic power system for applications that do not require an equipment or operations shelter – just power.
- The power system components are installed within one or more rugged, climate-controlled, weather-resistant housings ideal for harsh environments.
- The SkySkid™ system is easily positioned at its deployment location by forklift or by helicopter lift.

Figure is for illustrative purposes only. Actual equipment and system configuration may vary.
Trailer-Based Power System

- Fully automatic solar (high efficiency blankets) + wind + battery bank + diesel generator systems built onto military or commercial-grade trailers.

- Sets up in 45 min.

- Used by the US Army; combines mobility, rapid deployment, ruggedness, adaptability, reliability and high quality with relatively low maintenance.

- It provides power anywhere you can drive.

SkyBuilt’s SkyTrailer™ at a remote installation. Figure is for illustrative purposes only. Actual equipment and system configuration may vary.
Soldier Portable Powers

Man-Portable Renewable Energy System

- A rugged and reliable, soldier-portable power system for applications that require extreme mobility.
- Powers communications, medial devices, soldier radios, equipment
- Sets up in 3 min.
- High efficiency solar blankets

SkyCase™ SkyPAK solar blanket. Figure is for illustrative purposes only. Actual equipment and system configuration may vary.
SkyBuilt Power Company Profile


- Hybrid, Rapidly Deployable, Sustainable Energy Solutions and Technology – Changing the power paradigm
  - Unique Energy Power Products – pre-packaged, renewable, drop and operate energy systems – commercial, off-the-shelf
  - Set up in minutes/days, run for years, no fuel, little maintenance
  - Scalable, small to large output – 10W to MW and microgrid

- Military, intelligence, Homeland Security, telecom, international, disaster relief, water treatment, other

- Solar + Wind + Batteries + many options: generators, remote controlled, etc.