SkyBuilt Power's Advanced Hybrid Renewable Energy Systems: Markets, Products, and the Business Case

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ABSTRACT

SkyBuilt Power® is the leading renewable energy product integration company for rapidly deployable renewable power systems, mobile or fixed, on or off-grid. Options include solar, wind, batteries, generators, remote controls, fuel cells, micro-hydro, etc. Product platforms include man-portable systems, solar blankets, skids, trailers, containers, and micro-grid systems. Markets include military, intelligence, Homeland Security, telecom, disaster relief, and water treatment. SkyBuilt's unique market segment in the crowded renewable energy field is an added attraction for investors. As an integrator, SkyBuilt has little risk from new technologies that can leapfrog specific renewable products. It has patent protected, proven products, certified for safety and performance by the military; and In-Q-Tel, the CIA's strategic investment firm, is a shareholder. SkyBuilt's advanced technology systems save operating costs, can pay for themselves in months to a few years compared to diesel systems, and provide greater reliability and reduced logistics.

Keywords: renewable energy, solar, telecommunications, military, power

1 RENEWABLE ENERGY MARKET SEGMENTS AND THE UNIQUE NICHE of HIGH VALUE POWER

1.1 Overview of the Renewable Energy Market Segments

Renewable energy markets can be segmented in various ways. One approach is to segment them into four broad categories:

Segment 1: Traditional Grid Systems - Large central station power systems that provide electrical power to the regional grids for wholesale or retail distribution by electric utility companies;

Segment 2: Other Commercial/Industrial Systems - Local residential, commercial, and industrial distributed energy systems where the renewable and grid systems are commercial off-the-shelf systems installed by building contractors with little energy system engineering required;

Segment 3: Small Recreational/Hobby Systems - Small recreational and hobby systems for backpacks, tents, and cases for small electrical demands; and

Segment 4: SkyBuilt's Segment: High Value, Reliable, Fixed or Mobile Power - pre packaged solar/wind/battery energy systems demanding reliable, rugged power from 400 Watts to 50 kW+ on or off the grid. These needs typically have been met by fixed or mobile diesel generators requiring some degree of expert energy engineering and have special requirements for reliability. They also can be integrated into micro grid systems – a rapidly growing market segment.

SkyBuilt is focused on Segment 4, where requirements for quality, reliability, ruggedness are paramount and thus carry a premium sales price. This segment requires specific engineering and design considerations that Segments 2 and 3 do not have. SkyBuilt has end-to-end capabilities (from design to manufacture, sales, and maintenance and service) renewable energy solutions for military, intelligence, commercial and industrial customers, both domestic and international, using its patented hybrid power systems.

1.2 Advantages of the High Value Fixed and Mobile Power Market Segment

Targeting Segment 4 has several advantages, including:

Less competition – fewer market players and a higher barrier to entry;

Higher value products that translate into higher potential prices and profits;

Patent and intellectual property advantages already captured by SkyBuilt;

SkyBuilt's first to market lead in this Segment; and

SkyBuilt's unique engineering and other expertise to handle many complex projects that others cannot.

2 SKYBUILT POWER AND ITS PRODUCTS

2.1 SkyBuilt Power

SkyBuilt Power is the leading renewable energy product and systems integration company for hybrid, rapidly deployable power systems. SkyBuilt provides end-

Figure 1: SkyStation™ in remote location – no fuel.

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to-end services and products from consulting and power modeling to design, engineering, product delivery and installation and maintenance and service.

SkyBuilt invented the first self-contained, rapidly deployable, expandable, solar, wind and battery power systems. These on or off-grid systems have many options including: solar, wind, batteries, generators, remote control, fuel cells, micro-hydro, geo-exchange and other sub systems. Product platforms range from man-portable systems to solar blankets, skids, trailers, containers, and micro-grid systems.

2.2 SkyBuilt's Market Advantages

SkyBuilt has a unique market segment within the crowded renewable energy field that makes it attractive to investors.

Product Integrator. From an investor's perspective, SkyBuilt is a product integrator that can use best-of-breed components in its products. Therefore, it is relatively safe compared to other renewable companies with products that rapidly can become obsolete. It has patent protected, proven products, certified for safety and performance by the military, millions of dollars in sales.

Proven, Commercial Products. SkyBuilt's systems are commercially available, produced on assembly lines (allowing rapid ramp up capabilities), and field tested. Systems use commercial-off-the-shelf (COTS) components combined with SkyBuilt's patented rapid deployment, power control and other design features. They are the only hybrid renewable systems of their type certified for safety and performance for deployment worldwide by the US Army, after passing hundreds of tests over many months at Aberdeen Proving Grounds, MD.

First Mover and Market Leader Advantage, plus Patent Protection. SkyBuilt has first mover advantage in its field. It invented the world's first hybrid, mobile, renewable, expandable, energy system. These unique systems are patent protected; and hundreds of additional patent claims are pending in the US and worldwide. This, plus SkyBuilt's supply chain, manufacturing partners, proven record of success, and many customer relationships, create a major barrier to entry for others.

Demonstrated Fuel Savings to the Military. SkyBuilt's advanced technology systems save operating costs and can pay for themselves in months to a few years compared to fuel based systems, while providing more reliability and reduced logistics and maintenance. SkyBuilt's systems have been cited by the Department of Defense's recent report on military wide energy and fuel use, "More Fight – Less Fuel" [1] for their cost savings in the field – up to 97% for the US Army.

An-In-Q-Tel Company. In-Q-Tel, the CIA's strategic investment firm, and an investor in transformational technologies, is an investor in and has a development agreement with SkyBuilt.

One of Top 20 Technologies. The New Energy Congress (of worldwide renewable experts) has selected SkyBuilt's Mobile Power Station as one of the top 20 up-and-coming, clean, renewable, affordable and reliable energy technologies. [2]

One of "Ten to Watch" Companies for Potential Investors. SkyBuilt has been named to the "Ten to Watch" list of leading renewable energy companies in the investors' guide to renewable energy, The Clean Tech Revolution. [3]

From cell tower power to forward operating bases, SkyBuilt's systems are designed to be shipped to location, set up in minutes to hours, and operate for years with little or no maintenance, fuel, or logistics.

2.3 Typical Uses of and Customers for Hybrid Systems

Uses include military, intelligence, Homeland Security, telecom, disaster relief, water treatment, and commercial applications.

Markets include commercial telecom companies, the intelligence community, Army, Marine Corps (base load and expeditionary power, tactical ops centers, and renewable powered water treatment systems), Air Force (power for rapidly deployed airfields) telecom companies, health systems and mobile clinics, system integrators, and others.

These are huge, multi-billion dollar markets. Moreover, beyond these markets are a myriad of other applications showing significant potential.

2.4 SkyBuilt's Commercial-off-the Shelf (COTS) Products

Some of SkyBuilt's revolutionary products are:

Containerized Systems - the SkyStation™. The SkyStation is the world's first mobile, plug-and play, expandable, renewable energy power station in a standard freight container. It provides both power and conditioned space that can be used for any purpose, such as operations centers, telecom centers, classrooms, mobile clinics, etc., in any climate, worldwide. It sets up in a day or two, runs for years with minimum maintenance and fuel, and is expandable. (*see* Figure 2)

Trailer and Skid-Based Systems - SkyTrailer™ and **SkySkid™.** These systems are on trailers & skids with rapidly deployable solar blankets, wind turbines, backup batteries and a generator for medium power needs (500W – 20kW). They set up in less than an hour. (see Figure 3)

Cell Tower Systems - SkyTower™. These units are ideal for powering remote cell tower sites off the power grid and some grid sites as well. They provide more reliable power than diesel or propane generators while requiring far less maintenance. This is a rapidly growing market as more cell phones and increased data capacity are needed world-wide and the need to provide coverage in remote areas grows.

Figure 2: SkyStation™

Suit Case Power Systems - SkyCase™. SkyBuilt's SkyCase is a complete, wind, battery, and inverter (DC to AC) power system in a grab-and-go suitcase-sized Pelican Case(s). It is ideal for disaster relief, field communications, emergency lighting, surveillance, mobile medical power, water pumping, lighting, powering laptops, cell phones, etc. (see Figure 4)

Other Systems. Other systems include the **SkyWater System™**, rapidly deployable power plus high efficiency water treatment; and the **SkyTower™** renewable telecom power systems.

3 THE ECONOMIC CASE FOR HYBRID RENEWABLES

3.1 Overview

The energy crisis and the growing demand for renewable solutions are accelerating the need for hybrid products. Some of the major factors driving this demand are:

Figure 3: SkyStation™: Reliable power for any location.

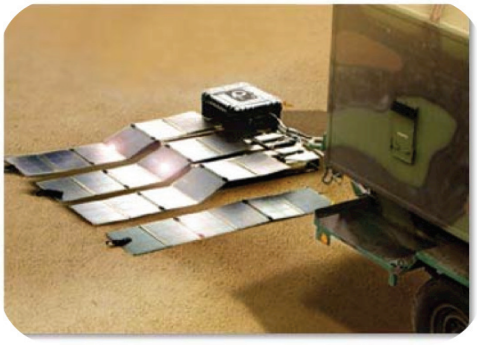

Figure 4: SkyCase™: Man-portable renewable energy.

Fuel Prices. Fuel prices will continue to be volatile; solar cells will continue to become more efficient, resulting in a lower dollar cost per Watt.

Environmental Concerns. These include increased environmental concerns at the local, regional, and global levels, including concerns about ozone and local health effects, haze, acid rain, and climate change.

National Security and Balance of Trade Concerns. There are national security concerns about energy dependence on foreign sources of oil and the huge transfer of wealth - some $1.5 trillion/yr. - between the oil importing nations and oil exporting nations; [4] and balance of trade, inflationary impacts, and currency devaluation.

Military Requirements for Lower Fuel Costs; Reducing the Logistics Tail for Transporting Fuel; Reliable Power in Remote Locations; and Saving Lives.

The cost for fuel for remote, deployed forces ranges from $15 to $42/gal., but can be up to $300/gal. and more in some areas [5]. In 2006, DoD spent $13.6 billion to buy 110 million barrels of petroleum. This is 78% of the energy consumption by the Federal government. [6]

The military needs proven solutions to counter high fuel prices, cut the fuel and spare parts logistics tail, and save lives by reducing the number of fuel convoys subject to Improvised Explosive Devises (IEDs).

US military bases also are under stricter controls to reduce pollution from diesel generation.

Homeland Security.

Homeland Security and First Responders (police and fire personnel) need reliable backup 24/7/365 for emergencies, for border protection, remote communications, emergency medical centers, food preservation, and sensors. Also, power to back up the grid is required.

Telecommunications. As cellular companies provide service to more remote areas and bandwidth is strained, additional power is required in more remote locations. High fuel costs, maintenance and logistics are major problems for companies with traditional power generators or those with inefficient grid, HVAC, and shelter conditions.

Disaster Relief. Local, national and international disaster relief services need on site power for communications, powering computers, pumping gas and other critical services when the grid is down. Diesel power is maintenance intensive and fuel supplies are frequently unavailable during disasters when roads are blocked.

Developing Countries' Needs. Diesel fuel and logistics have become too expensive in many locations for powering health clinics, water pumping, village power and other critical human and other needs for sustainable economic development.

Improved Technology. Improved solar, wind, micro-hydro (small water- driven turbines in running water) and other renewable products developed by others are becoming more efficient, reliable, and economic.

3.2 Life Cycle Cost Savings

The following chart shows one example of typical cost savings from a SkyStation using solar, wind, batteries and a backup propane generator compared to during a diesel generator 24/7/365.

This data comes from an actual telecom site in Arizona with good solar insulation and low wind resources. Power output is 5-15kW. All capital and operating costs are shown over a 30 year period. Cost savings are dramatic. In approximately three years, the capital cost of the SkyBuilt system would have been fully recovered, saving over $4 million dollars over that period, while improving reliability and reducing manpower, fuel and maintenance for the next 27 years.

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[5] DoD, "More Fight-Less Fuel," p.28; and US Army sources.

[6] Id., p. 11.

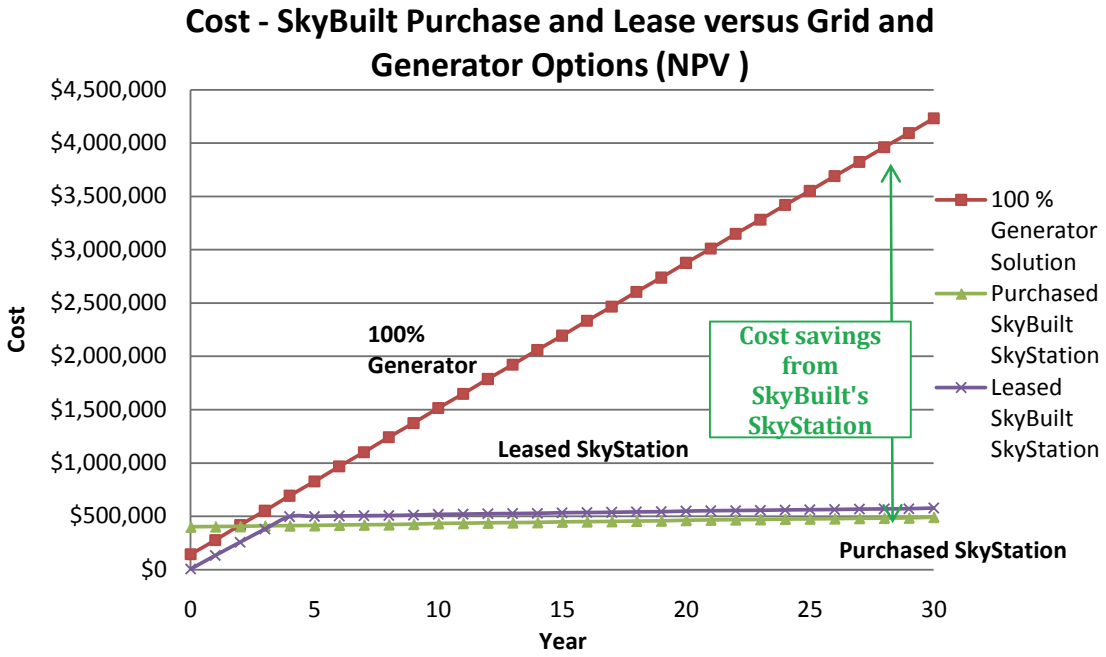

Table 1: Cost - SkyBuilt Purchase and Lease versus Grid and Generator Options.