

Investing in Energy Storage

Special Report

You've heard the plans.

We'll double the use of renewables in three years. We'll get 20% of our power from wind by 2020. And so on.

They're lofty goals and they'll generate serious profits. In fact, fortunes have already been made from the public-facing technologies like wind and solar.

But for the industry to progress as quickly as planned, there are several hurdles that need to be overcome. And that's where the crazy money will be made.

Wind and solar are great. I've made money off of them and I've helped investors profit from those sectors — and I will continue to do so.

But what happens when the wind doesn't blow or the sun doesn't shine? How can these resources provide baseload power if they are intermittent?

The answer is advanced energy storage. . . and it's worth billions.

The Need for Energy Storage

Here's a blurb from the *Christian Science Monitor* that puts it in perspective:

While the Obama administration presses to expand renewable energy with emphasis on growing wind farms and utility-scale solar, these efforts could vastly increase the need to build new backup power plants - much of which today involves firing up natural-gas turbines when the winds die down. The only way to avoid using fossil fuels is to develop grid storage.

If solar power isn't available at night, for example, it can never become a source of baseload power like coal or natural gas. Large scale energy storage can change all that.

So when the wind is blowing and the sun is shining, some power is delivered to the grid and some is stored for later use — after the sun goes down or when wind speeds decline.

Until now, the problem was that energy storage technology was not advancing as fast as energy production technologies.

That gap is now narrowing, which means profits on both fronts for those in the know.

And the best part is energy storage is a can't-fail sector. It's critical for the rapid expansion of renewable energy. And Congress is guaranteeing it happens.

Investing in Energy Storage, an Introduction

This sector is so vital that it will soon approach inelastic demand. That means suppliers of energy storage technology can raise prices without reducing demand. . . great news for investors.

And like I said, Congress needs this to happen, or their grandiose plans for renewable energy are moot. They are propelling this industry with billions of dollars of stimulus money and other programs through national laboratories and partnerships.

As a side note, energy storage falls under the broad umbrella of smart grid. So Federal money for smart grid is also funding for energy storage — also referred to as grid reliability.

It's a big sector with multiple technologies. So before you take the investment plunge, you should be aware of all the different types of energy storage devices that exist:

- Lead acid

- Nickel Cadmium

- Nickel Metal Hydride

- Sodium Sulfur

- Zinc Bromide

- Superconducting Magnets

- Flywheels

- Fuel Cells

- Compressed Air

- Capacitor and Ultracapacitors
- Lithium-ion

There's a market and a company for each of them. The trick is nailing down the right time to invest in the right sector.

It's estimated that energy storage will morph into a \$600 billion industry over the next decade — not to mention it's the missing link to propelling renewable energy from marginal to mainstream.

And yet, it gets much less attention than its solar and wind cousins, giving savvy investors a brief window of opportunity.

Energy Storage Gets a Jolt

The energy storage market usually isn't one to attract attention. It's chugged along quietly for some time; its only public mascots the Energizer Bunny and the less-exciting Coppertop.

Now instead of powering an army of Walkmans, batteries are being looked to as a power source for the entire grid, charged time after time by renewable energy.

After attending the industry's keystone annual event, Battcon, Piper Jaffray put out an industry note stating that battery "industry experts, manufacturers, and distributors. . . view 2009 as a turning point for the industry."

The catalyst?

Billions of federal stimulus dollars are about to begin flowing to the sector because, as we discussed last week, improving storage is the only way drastically expand our use of renewable energy — a main congressional and presidential goal.

In fact, the potential for the energy storage industry is so big that, if over the next decade just 1% of energy storage demand is met, the industry will be worth at least \$600 billion — all of which will end up on the balance sheet of energy storage companies.

Winning Energy Storage Technologies

Compressed Air Energy Storage (CAES), is exactly what the name implies: Instead of using a resource to generate electricity, the resource is used to compress air, which is later heated to produce electricity.

So, for example, a wind turbine could be compressing air all day, to be used as electricity later when the wind stops blowing. These are huge, high-cost projects, with natural geological formations usually used to store the air.

As large renewable projects begin to add a storage component, CAES will be increasingly used. Leaders there include Alstom (PARIS: ALO), and Dresser-Rand (NYSE: DRC).

Fuel Cells use electrochemical reactions to store energy. Since they cannot be charged and discharged quickly, fuel cells will mainly be used in lengthy back-up power applications. Though less proven and a bit further from widespread use, Ballard Power (NASDAQ: BLDP), Plug Power (NASDAQ: PLUG), and Hydrogenics (NASDAQ: HYGS), are all pursuing solutions.

Flywheels are mechanical storage devices that take electricity from the grid and store it a rotating wheel for later use. This will help smooth out disparities between peak and non-peak hours. In some cases, utilities will be able to store cheap excess energy and resell it during peak hours. Though less-exciting, being able to quell power interruptions and voltage surges is soon to be big business. Beacon Power (NASDAQ: BCON), Active Power (NASDAQ: ACPW), and Vycon (LON: VYCO), are all vying for a piece of it.

Superconductors and Ultracapacitors may hold the best potential because they can deliver power almost instantaneously, greatly improving grid stability and distribution. Maxwell (NASDAQ: MXWL), is the far-and-away leader here. With strong ties to the electric vehicle and wind markets, I look for this company to become a storage stalwart.

Those are all the non-battery energy storage technologies. While all the technologies will find a place in the market, all the companies certainly won't. Some will go on to greatness and some will fall off the map.

Only in-depth research can make the difference between good returns and putting your money in the next start-up to file Chapter 11.

Batteries for Energy Storage

Batteries are still the bread and butter of this industry. We use them for everything from cell phones to forklifts.

There are four main kinds, each with different uses, benefits, and profit potential.

Lead Acid batteries are the cheapest and most widely used. They're found in automobiles, forklifts, and in many back-up power applications. The technology is well-known, and so are the companies that make it. Johnson Controls (NYSE: JCI), is the world's largest producer with C&D Technologies (NYSE: CHP), and Exide (NASDAQ: XIDE), worth a look.

Nickel Metal Hydride batteries have high energy density are rechargeable, making them highly useful in the electric vehicle and consumer electronics markets. Panasonic (NYSE: PC), is the leader here, but Hongkong Highpower (AMEX: HPJ) and the Buffett-backed BYD (HK: 1211), are making big strides.

Sodium Sulfur Batteries are causing quite a stir right now because of their huge potential for renewable energy storage. Utilities like Xcel Energy (NYSE: XEL), and American Electric Power (NYSE: AEP), are already testing them on a multi-megawatt scale. The established company here is Japan's NGK Insulators (TYO: 5333), with U.S.-based start-up Geo-Battery in hot pursuit.

Flow Batteries are unique because they have unlimited capacity. The batteries are fueled by storage tanks of electrolytes. As long as there's fuel in the tank, the battery will work. With such flexibility, these batteries can be used for cars or grid storage. ZBB (NYSE: ZBB), and Sumitomo Electric Industries (TYO:5802), are the two worthy public companies in the field, with a number of private companies recently joining the ranks.

Lithium-ion Batteries are the most well-known. Lightweight and with high-energy density, these batteries are now ubiquitous in cell phones and laptops, and are being developed for electric vehicle applications. Being the incumbent technology, there are plenty of companies to choose from. Ener1 (AMEX: HEV), Valence Technology

(NASDAQ: VLNC), Āltair Nanotechnologies (NASDAQ: ALTI), Advanced Battery (NASDAQ: ABAT), and UltraLife (NASDAQ: ULBI), in addition to others, are all making strides in the industry.

Energy Storage: The Bottom Line

It may be hard to imagine now, but energy storage is just as important as renewable energy. In fact, the expansion of renewable energy would stall without it.

This fact has largely escaped the investment and political realms as technologies like solar and wind hogged the spotlight. As their omission is realized, billions of dollars will be spent to make up for lost time.

This is your chance to get ahead of that curve. . . to get a piece of the action before the herd realizes what's going on.

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