
*A REALITY CHECK
ON
VENTURE INVESTING
IN
CLEAN ENERGY TECHNOLOGIES*

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I am a huge advocate of investing in clean tech, particularly clean energy technologies, and I may well have invested in more clean energy deals than anyone on the planet.

But having said that I want to use my few minutes today sharing with you my view of the realities of investing in this space today.

OUR ENERGY INVESTMENT VEHICLES

- 6 Aretê Funds
 - » 4 Utech Funds ('85 - '91)
 - » Climate Challenge Fund ('94)
 - » Micro-Generation Technology Fund ('97)
- S.A.M. Private Equity Fund (Zurich)
- Nth Power
- Commons Capital

My perspective comes from managing 6 venture capital funds for 20 years, and serving on the investment committee of, or as an advisor to, 3 others.

What I can report from the trenches is a bit less buoyant than the story you have heard from some of my colleagues.

CHANGING OF THE GUARD

- Attrition among the established Funds
- A few old hands remain
- New entrants with little experience
- Some traditional V.C.'s entering

The last few years have been very tough for both private and public companies in the clean energy space. As a result

- The ranks are thinning, with only a few of us old hands remaining.
- A few new players are entering or trying to; some came in at the peak and have been clobbered; few have yet to establish a solid track record.
- And a few traditional V.C.'s looking for new fields to invest in are considering clean tech as an alternative to the internet and telecom. Some are doing deals the old hands passed on, which may result in disappointment.
- And, when they come into established deals they are often crushing valuations.

CLEAN ENERGY DEALS ARE NOT EASY

Getting to the goal line

- Takes a great deal of money (often \$100M plus)
- And a very long time (frequently 7-10 years)

And sometimes the goal line moves...

Before I talk about some specific examples of clean energy technology deals I'd like to share with you what I view as general truths about the clean energy space:

Getting to the goal line

- Takes a great deal of money
- And a very long time

Sometimes, the goal line moves...

OTHER PERILS

- The IPO market for energy technology companies is dead
- Adoption rates for new energy technologies are very slow
- Regulatory drivers are risky to bet on
- There is no track record of profitability in energy technology
- Public market investors got burned in 1999-2001

- As a result, it is very hard to make money on these deals unless there is a booming IPO market -- and right now, it's dead.
- Even when financial markets are strong, adoption rates in the energy sector itself are very slow.
- Regulatory drivers are extremely risky to bet on
 - We've done 6 pure environmental deals and made money on only one -- Solarchem (a Canadian deal)
 - The Enviroplan story illustrates the rest. (details verbally)
- Even when we have made money, virtually none of the companies have yet achieved profitability, for example
 - Ballard
 - American Superconductor
- The 1999-2001 IPO bubble saw many companies go public at lofty values and then fail to deliver -- so the public market has grown very skeptical of clean energy technologies.

ARETÊ CLEAN ENERGY INVESTMENTS

1. Ballard Power Systems, Inc.*	P.E.M. Fuel Cells
2. Astropower, Inc.*	Photovoltaics
3. American Superconductor, Inc.*	HTSC wire
4. Superconductivity, Inc.	Micro-SMES (now ASC)
5. Evergreen Solar, Inc.*	Photovoltaics
6. World Power Technologies, Inc.	Power Quality monitoring
7. Statpower Technologies Corp	Inverters (now Xantrex)
8. Northern Power Systems, Inc.	System Integrator (now part of DESC)
9. Proton Energy Systems, Inc.*	P.E.M. Electrolyzers / URFC (now part of DESC)
10. Capstone Turbine Corp*	Microturbines
11. Metallic Power, Inc.	Zn - Air fuel cell
12. Encorp, Inc.	Controls and Integration
13. BurstPower Technologies	Ultracapacitors (now CellTech)
14. Beacon Power Corp*	Flywheel UPS / PQ systems
15. Hydrogenics Corporation*	P.E.M. Test Stations
16. Bowman Power Systems, Ltd.	Microturbine CHP
17. Powerzyme	Organic Battery / Fuel Cell
18. CellTech Power, Inc.	Solid Oxide Fuel Cell
19. H2 Gen Innovations, Inc.	Steam Methane Reformer
20. STM Power, Inc.	Stirling Engine Gensets
21. Angstrom Power, Inc.	Micro P.E.M. Fuel Cell

* Public Company

Despite all that

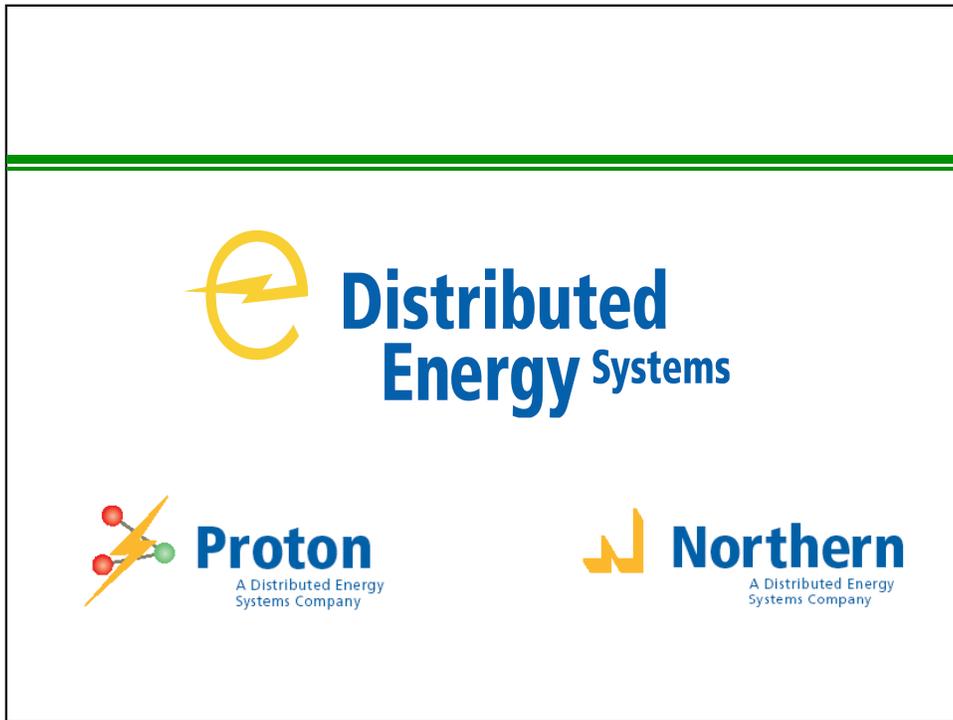
- We have consistently made money in clean tech over a 20 year time frame, though not at the rate of investors in software, internet, and telecom.
- Our funds have ranged from 11% to 34% IRR and over all 6 funds we've averaged about 15%.



Let me tell you about a couple of examples:

First, EVERGREEN SOLAR

I've had the honor of serving as Chairman of Evergreen from its very beginning in 1994, helping the Evergreen team raise \$100M to develop the String Ribbon process for making PV modules. Our IRR on this deal was 38%.



And second is DISTRIBUTED ENERGY SYSTEMS, which was born just this last December from the merger of Proton Energy Systems, which builds electrolyzers to make hydrogen, and Northern Power Systems, which has been installing renewable energy systems around the world for many years. Together these two great companies, now one, are building systems to use renewables to make hydrogen, the perfect fuel. Together they have raised over \$240M and are well on the way to profitability. I am proud to serve as Chairman of DESC.

HARSH PRIVATE EQUITY MARKET

- STM POWER
 - » Stirling engine
 - » High efficiency
 - » Low pollution
 - » Landfill / biogas
 - » Commercial units ready

Since the overall market melted down, however, the private equity market has become very difficult, even draconian, for clean tech companies.

Let me share with you a few examples, The first is:

STM Power

- Raised almost \$70M
- Developed clean, high efficiency Stirling engine, which runs well on biogas and landfill gas.
- Had to raise \$30M to reach commercial production
- All the previous value was compressed to \$2M in the financing.
- It is not fun to have this happen to you.

HARSH PRIVATE EQUITY MARKET...

- METALLIC POWER
 - » Zinc-air fuel cell
 - » Recycle the zinc; zero pollution
 - » Back-up power
 - » Field trial unit running

Metallic Power

- Metallic is a Zinc-air fuel cell company with field trial units running.
- Raised \$13.6M last year, but had to compress \$46M value to \$9M to do it.
- Ironically that looks good compared to STM Power.
- Hard to convince people to do these deals at the outset when this kind of disaster happens.

HARSH PRIVATE EQUITY MARKET...

- H2GEN INNOVATIONS
 - » Low cost, efficient SMR
 - » Makes pure H2 from natural gas
 - » Beta units running

H2Gen Innovations

- Great SMR technology to produce hydrogen, the perfect fuel. Beta units work, yet
- Virtually no V.C. will look at the deal.
- Why? “Too long to market, and too much capital needed” to get there.
- Investors have lost faith in the fuel cell / hydrogen story.

HARSH PRIVATE EQUITY MARKET...

- CELLTECH POWER
 - » Novel SOFC
 - » Ideal residential fuel cell
 - » Working alpha unit
 - » Very cost effective

CellTech Power

- This little company has the perfect residential fuel cell / CHP.
- It is a SOFC system, and they have built a full scale working unit.
- The company is finding it hard to raise \$10M to go to the beta unit from the successful alpha unit.
- Why? Takes too long, costs too much.

So, when you look at glowing statistics on clean tech deals getting done, be careful on the conclusions you draw!

HARSH PRIVATE EQUITY MARKET...

- STM POWER
- METALLIC POWER
- H2GEN INNOVATIONS
- CELLTECH POWER

I can tell you with certainty it's really grim out there right now, as these 4 examples illustrate. And they aren't the only ones.

There are a few winds of change blowing... we recently got competing term sheets in a portable power deal -- but only at a flat valuation.

The situation I've described makes me very sad, as a true believer in clean energy technology, and a devoted early stage investor, and I apologize to you for seeming gloomy. But it is the truth about the investment climate today, unfortunately.

WHAT MUST CHANGE?

- Strong public / IPO market
- Success stories
- Serious commitment to a sustainable energy economy

So, what has to happen to change the climate?

- A strong public / IPO market would certainly help -- so venture investors could see an exit pathway.
- Some of the early players showing signs of real success would be a huge plus.
- And, most importantly, a serious commitment to sustainable energy economy by business and government --
 - Germany, Japan, and Canada seem to get it;
 - The U.S. does not, yet.

BOTTOM LINE

- Making money in clean energy investments is very hard
- Part of the return is the satisfaction of doing something valuable for the planet

The Bottom Line

- Making money in clean energy technology is very hard: It's not for the faint of heart or the impatient; deep pockets help.
- We continue to invest cautiously because we believe a world wide sea change is happening -- if slowly.
- It is important to remember that part of the return is the satisfaction of doing something valuable for the planet, and our children's children -- the triple bottom line.