

A Venture Capital Perspective on Technology  
Transfer and Alternative Energy

*Presentation to the State Energy Advisory Board  
(STEAB)  
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EPIC  
VENTURES

# Discussion Agenda

- Venture Capital 101
- Investing in Alternative Energy
- Technology Transfer and Venture Capital



# What Is Venture Capital?

- Money provided by investors to high potential private companies
  - Can be startups or small companies, high tech or low tech
  - Give up 25% to 55% control
  - Usually provided as equity
- Risk/reward expectations
  - High risk (technology, market, execution), BUT
  - High reward: 10x cash return potential on winners
  - High early stage company death/walking wounded rate:
    - Technology doesn't work as planned
    - Market doesn't develop, or develops too slowly
    - Team doesn't perform
    - Excess competition
- Goal: successful sale to public or private investors in 5 to 7 years



# What Differentiates High Tech Early Stage VCs?

- Emphasis on novel, defensible technologies with ‘order of magnitude’ improvements versus conventional approach; value lies in the technology
  - 10x+ improvement on cost, speed, quality, convenience
- More than financial assistance -- hands-on ‘value added’ investment approach
- Different model and investment criteria than hedge funds, buy-out, project finance, corporate venturing, angel investors, corporate R&D, government R&D



# Who Are Venture Capitalists?

- Professional fund managers with skills in finance, technology or operations who:
  - Identify and screen promising entrepreneurs
  - Invest in top management teams to create a portfolio of startup companies
  - Serve on the boards of portfolio companies, providing advice, financial help and hands-on support
  - Assist companies in exiting (selling the company) through M&A or an IPO



# Who Funds Venture Capitalists?

- Professionally managed venture capital firms generally are limited partnerships funded by:
  - private and public pension funds
  - endowment funds
  - foundations
  - corporations
  - wealthy individuals
  - foreign investors
  - venture capitalists themselves



# How Are Venture Capitalists Paid?

- General partners (the VCs) manage money for the limited partners (investors)
- VCs are paid by LPs in two ways:
  - Fees (small percent of money invested)
    - 5 to 10 years, declining or disappearing thereafter
    - Pays salary, travel, telecom, conference expenses to run the day to day operations of the fund partnership
  - Carry (return on a portion of the gain after principal is returned to investors)
    - Can be many times greater than fee income for a highly successful fund
    - Can be zero if performance is poor and capital is not returned to investors; fees are foregone as well if performance is poor

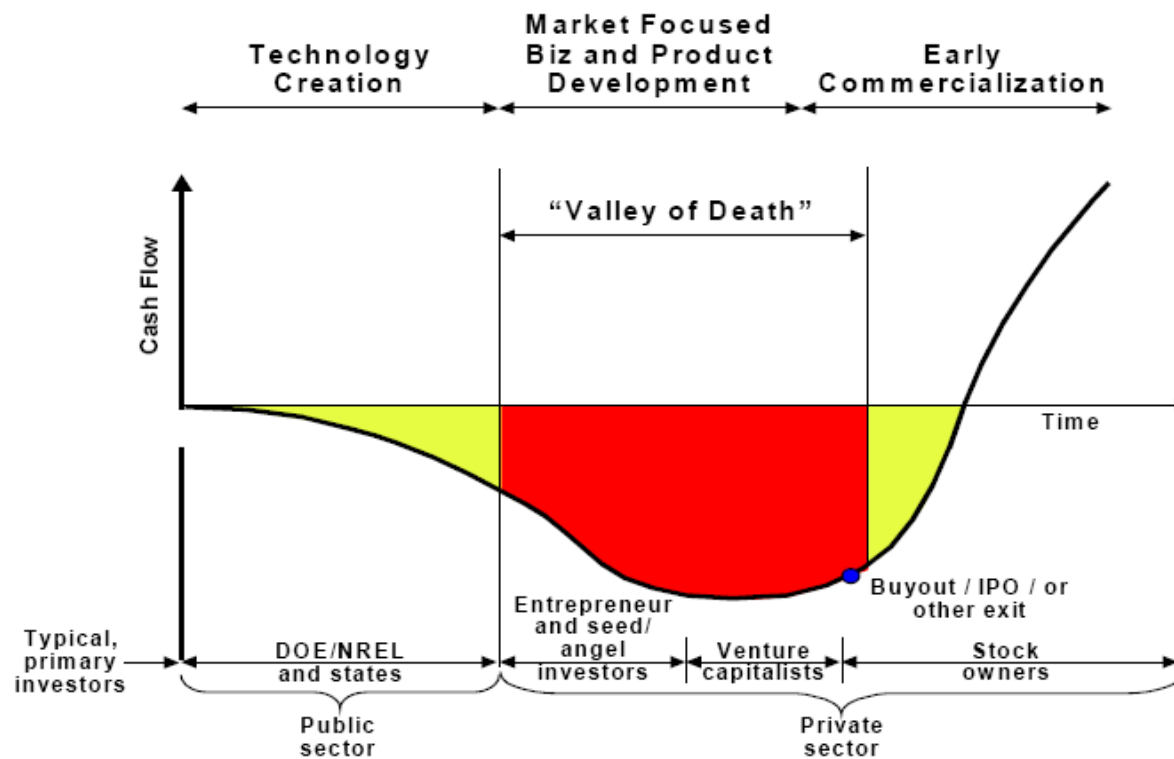


# Getting to Exit

- No exit = no return = grumpy limited partners = no new fund for VCs
- Exit = selling the company, preferably for a very large return
- Goal = 10x
  - Respectable = 3-5x
  - Wow = 20-25x
- M&A = sale to strategic corporate investor or to private equity (most VC exits)
- IPO = sale to public investors through an Initial Public Offering



# Typical Technology Funding Cycle



Source: Amadeus Capital Partners



# Venture Capital in New Mexico

- Young industry in New Mexico
  - 1998: Legislation enabling state investment into venture capital firms through regional program
  - 2000: fewer than five active VC firms
  - 2007: record-breaking investment pace
    - \$128 million
    - Investments into 21 companies (initial and follow-on)
    - 600% increase over decade in amount of funding
    - 375% increase over decade in number of companies
  - 2008: continued growth
    - 20 firms with investments or office in New Mexico
    - #1 fastest growing VC market in the U.S., ahead of Pittsburgh, L.A., Seattle and the Washington metro area
  - 2010: first high profile VC-backed company exits (my personal prediction)
- Reality check: growth rate is not absolute size
  - San Jose 2007 VC investment = \$7.6 billion
  - San Francisco/Berkeley 2007 VC = \$2.5 billion



## VC Segmentation and Project “Fit”

- Stage: early vs. late
- Fund size: ability to manage high vs. low capital intensity → key issue for alternative energy investments
- Technology-driven focus vs. execution focus



“Fit” matters – need to work with the right VCs for a given project



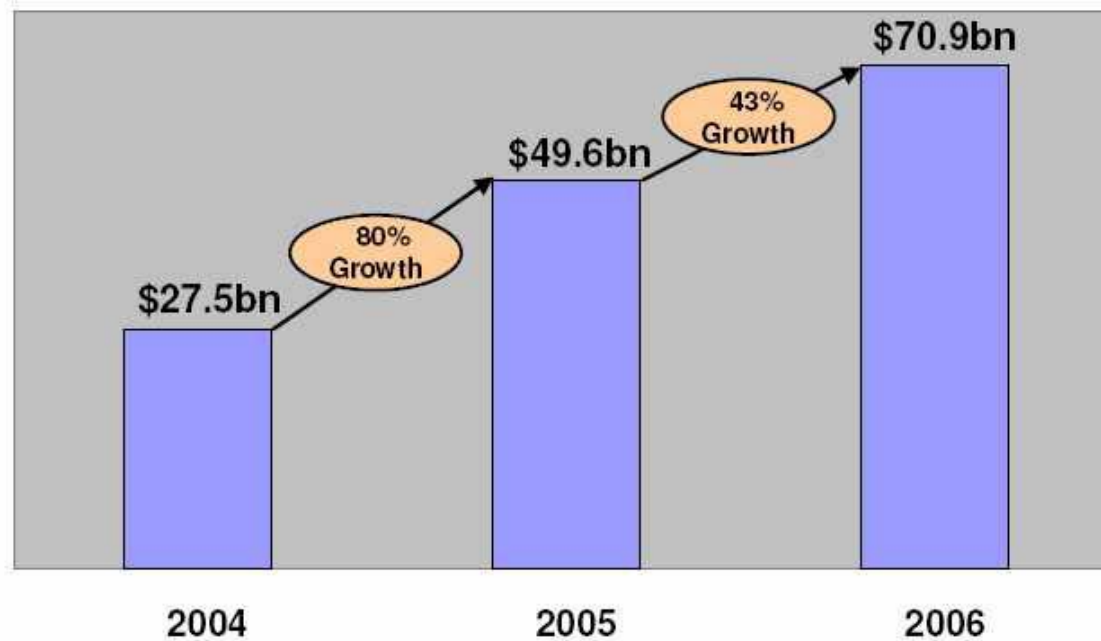
# Investing in Alternative Energy

- “Cleantech”/”Greentech” = 2007 fastest growing VC investment category, continued fast growth expected
- Why now? Compelling drivers include:
  - Rising global demand (China, India) and prices for energy
  - Concern over energy security
  - Social pressure on environmental topics
  - Demonstrated commercial success in enormous and growing markets (e.g., solar, biofuels)
  - Technology advances making renewables price-competitive with fossil-fuel based power generation
  - Recent major exits (e.g., German and Chinese solar IPOs)



# Global Clean Energy Investments

## Global Investment in Clean Energy 2004 - 2006



Source: New Energy Finance, new investment in disclosed deals only



# VC Investment in Cleantech

- First investments in mid 1990s, less than 1% of VC investments
- 2007: over 7% of VC invested (US) and seventh largest category of VC investment at \$3.4b invested
- First wave:
  - Wind-based power
  - Silicon-based solar
  - Corn-based ethanol
- Second wave:
  - Non-silicon based thin film solar
  - Cellulosic ethanol



# VC Investment in Cleantech

- Huge global market opportunities, expected to reach \$50b each over next ten years
  - Solar now: \$11b
  - Wind: \$12b
  - Biofuels: \$16b
- Over 950 energy startups worldwide, with over 1,500 cleantech startups overall



# Top VC Investment Areas in Cleantech

- Solar
- Biofuels (primarily ethanol)
- Fuel cells
- Advanced batteries and sensors
- “Smart grid” applications
- Water purification



## Major Recent Cleantech Exits

- Solar: Conergy, Ersol, Q-cells, Sunpower, Suntech and others
- Ethanol: Pacific Ethanol, VeraSun Energy, Aventine Renewable Energy



# 2008 Cleantech Trends to Watch

- Politics go “green”
- Cleantech driving new business and financing models to accelerate cleantech adoption “Price per bushel” vs. “Price per barrel” helping drive progress in cellulosic alternatives
- Rising concern around water supplies (key renewable input)
- Emergence of “CleanChip” clusters in Asia, EU, ME
- Solar breakthroughs--\$1/watt PVs in lab—and traction on second gen biofuels, lithium ion batteries and other technologies long in the works
- China shifts from manufacturer to major end-market demander
- Focus on energy efficiency/demand response/smart grid initiatives

Source: Nicholas Parker, Cleantech Group Chairman



# Cleantech Sector Specific Risks for VCs

- Financing challenges → Need new model
- Lack of serial entrepreneurs with sector experience
- “Bubble pricing” emerging/concerns about overheating
- Very long adoption cycles
  - typical for new materials (in any sector)
  - many energy/cleantech plays involve major adoption hurdles (value chain changes, new material adoption etc)
  - Consumer resistance/ignorance and high initial cost/hassle of demand response/smart grid systems/renewable energy systems



# Yes, We Like Disruptive Technologies, But...

- Two kinds of disruptive clean technologies (per Rob Day of @Ventures)
  - “Compatible”:= offer significant economic benefits (reduce cost/increased performance) without upsetting status quo relationships and behaviors
    - Hybrid vehicles (uses same gas station)
    - LED-based lightbulbs that fit in regular light sockets
    - Thin film solar panels in traditional formats
  - “Incompatible”:= Big Ideas that blow up the value chain and skewer major incumbents
    - Fuel cell-powered vehicle...um, where do I fill up on hydrogen?
    - Specialized lighting controls—no more sockets...
    - Building integrated PVs—no installer needed
- VCs invest in both, and generally agree that:
  - bigger returns lie in the Big Idea major changes implied by the “Incompatible” disruptive technologies
  - The Big Idea “incompatible disruptive technologies” also offer investors a much higher death rate and much slower adoption rate



## Challenges: Scale and Capital Requirements

- Typical cleantech energy project is far larger in scale and more capital intensive than traditional VC investments in biotech or IT
- Impact:
  - Funding gap between VC and public market stage
  - Project finance players risk averse, tend to avoid new technologies as “unproven”
  - Driving cleantech VC funds to enormous sizes
  - Need a new financing paradigm to bridge the gap, e.g., VC-project finance partnerships



# Ways Smaller VC Funds Can Play?

- Capital efficient/low capital intensity areas:
  - Wireless metering/real time pricing/smart grid
  - Intelligent sensors
  - Batteries
  - Fuel cells
  - Advanced materials
  - Transmission control systems (hardware/software)
  - “Negawatts” demand response aggregation
- Partnering with project finance—VC funds prototype/initial manufacturing layout/regulatory investment and project finance builds the large plants



## Technology Transfer and Venture Capital

- Basic issue #1: VCs invest in businesses, not technologies. Without an entrepreneur, we cannot invest.
- Basic issue #2: Most of VC investment decisions are driven by the quality and experience of the entrepreneur. See issue #1.
- Exception: large funds or strategic investors that license a technology and recruit a team from scratch



# Technology Commercialization Funnel



# Tech Transfer Initiatives

- National lab Entrepreneur In Residence (EIR) program → Great first step
- Tech Maturation Fund: \$50k to \$100k awards to in-house entrepreneurs; VCs on selection committee
- Local equity symposia, e.g., TVC and NM Connect in New Mexico or ASU Technopolis in Arizona that offer coaching and training to lab and university researchers on VC fundraising
- Informal connections between VCs and the labs/universities

