Innovating the Green Economy in California

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January 2010
Innovating the Green Economy in California

• Why here?
• Why now?
• How is it different?
• The role of the University
• The role of government
• Challenges ahead
  – Is there a market?
  – How do you stage risk?
  – How do you prove business models?
Overview of Clusters of Innovation Theory
Each Regional Economy Has A Unique Mix of Clusters

**Silicon Valley / Bay Area**
Microelectronics, Biotechnology, Venture Capital

**Boise**
- Sawmills
- Farm Machinery

**Omaha**
- Telemarketing
- Hotel Reservations
- Credit Card Processing

**Wisconsin / Iowa / Illinois**
- Agricultural Equipment

**Minneapolis**
- Cardio-vascular Equipment
- Office and Institutional Furniture

**West Michigan**
- Polymers
- Imaging Equipment

**Western Massachusetts**
- Polymers
- Imaging Equipment

**Boston**
- Mutual Funds
- Medical Devices
- Mgmt. Consulting
- Biotechnology
- Software and Networking
- Venture Capital

**Hartford**
- Insurance

**Providence**
- Jewelry
- Marine Equipment

**New York City**
- Financial Services
- Advertising
- Publishing
- Multimedia

**Pennsylvania / New Jersey**
- Pharmaceuticals

**Silicon Valley / Bay Area**
- Microelectronics
- Biotechnology
- Venture Capital

**North Carolina**
- Household Furniture
- Synthetic Fibers
- Hosiery

**Los Angeles Area**
- Defense Aerospace
- Entertainment

**Carlsbad**
- Golf Equipment

**Phoenix**
- Helicopters
- Semiconductors
- Electronic Testing Labs

**Colorado**
- Computer Integrated Systems / Programming
- Engineering Services
- Mining / Oil and Gas Exploration

**Dallas**
- Real Estate Development

**Wichita**
- Light Aircraft
- Farm Equipment

**Baton Rouge / New Orleans**
- Specialty Foods

**Southeast Texas / Louisiana**
- Chemicals

**Detroit**
- Auto Equipment and Parts

**Warsaw, Indiana**
- Orthopedic Devices

**Michigan**
- Clocks

**Rochester**
- Imaging Equipment

**Detroit**
- Auto Equipment and Parts

**Venture Capital**

**West Michigan**
- Office and Institutional Furniture

**Detroit**
- Auto Equipment and Parts

**Hartford**
- Insurance

**South Florida**
- Health Technology
- Computers
The Innovation Engine of Clusters of Innovation

- Universities
- Major Corporations/Strategic Investors/R&D Centers/Potential Acquirers
- Entrepreneurs
- Venture Capital Investors
- Professions
- Government
- Management
- Public Stock Markets
- Large Pools of Private Capital
Note: Expenditures are deflated using the GDP implicit price deflator.
The Proportion of Research Expenditure at Our Largest Corporations is Decreasing

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Overview of Clusters of Innovation Theory
Location Example: BioTech and Proximity to Research Institutions

As of July 2002, there were 208 biotechnology companies in the Greater San Francisco Bay Area
- 391, statewide

A “biotechnology company” is a for-profit business entity with an active R&D operation in California that uses the tools of modern molecular biology

Source: University of California Industry-University Cooperative Research Program
Overview of Clusters of Innovation Theory
Location Example: Interaction Between Academia & Business

- UC scientists were founders of 74 of the 208 (35%) biotechnology companies in the Greater SF Bay Area that were in business as of July, 2002.

Source: University of California Industry-University Cooperative Research Program
Overview of Clusters of Innovation Theory
Location Example: Linkage Between Universities & Local Firms

- More than 158 of the 208 companies (75%) in the Greater San Francisco Bay area are linked to UC scientists and research through:
  - Founders
  - Scientific Advisors
  - Alumni Employees
  - Research Sponsorship at UC, especially participation in the UC Discovery Grant Program

Source: University of California Industry-University Cooperative Research Program
Bay Area Draws Most Investment Dollars

Regional Investment in the United States 3Q ’09

- Bay Area: 45%
- New York Metro: 10%
- Southern California: 9%
- New England: 10%
- New York Metro: 5%
- Research Triangle: 1%
- Potomac: 3%
- Texas: 4%
- Pacific Northwest: 4%
- All Other US: 19%

Source: Dow Jones VentureSource
The Technology S Curve and Entrepreneurial Opportunity

The Technology S Curve and Entrepreneurial Opportunity

Strategy: Using Small Markets as “Beach Heads”

The Technology S Curve and Entrepreneurial Opportunity

“Sustaining” Technological Innovation

Big Companies Need A Continuous Process

First Technology

Second Technology

Third Technology

Strategy: Using Small Markets as “Beach Heads”

Strategy: Using Small Markets as “Beach Heads”

Application (Market) “A”

Performance as Defined in Application “A”

Technology 1

Time or Engineering Effort

Application (Market) “B”

Performance as Defined in Application “B”

Technology 2

Disruptive Technology
- new market niche
- small markets
- small companies

Strategy: Using Small Markets as “Beach Heads”

Application (Market) “A”
Big Market

Application (Market) “B”
Niche “Small’ Market

BOOM!

Technology 1

Technology 2

Time or Engineering Effort

Strategy: Using Small Markets as “Beach Heads”

Application (Market) “A”

Disruptive Technology takes over the larger established market!

Older BIG company playing catch-up

New entrant dominates

Application (Market) “B”

Technology 1

Technology 2

Time or Engineering

Effort

The Technology S Curve and Entrepreneurial Opportunity

Mini / Work Station Computing
DEC/Apollo/Sun

The Technology S Curve and Entrepreneurial Opportunity

The Technology S Curve and Entrepreneurial Opportunity

Internet Computing
Google/Yahoo/EBay

Personal Computer
Apple/DELL/ Microsoft

Mini / Work Station Computing
DEC/Apollo/Sun

Innovation Progression

• Innovation progresses with multiple companies

• **Past:** Innovation concentrated within industry leaders

• **Today:** Innovation is driven by combinations of startups and mature corporations building on the work of each other

• Mergers and acquisitions facilitate the progression and provide investor returns
Technology or Innovation Development and Commercialization

- Rapid Innovation
- Product Expansion
- Short Product life Cycles

- Technology Performance

- Stabilization
- Standardization
- Mass Adoption

- Decline
- Intense Competition
- Price pressure
- Performance pressure

Performance vs. Time or Engineering Effort

- Initial Commercialization
- Proof of Concept

Graph shows stages of technology or innovation development, including phases of performance, time, and engineering effort.
Technology or Innovation Development and Commercialization
One Innovation NOT One Company

Enterprise A
Founder Driven, VC Funded

Enterprise B
Growth Oriented
Acquiring New Functionality

Enterprise C
Oligarchic Consolidation
Acquiring Customers
Rationalizing
Cost Cutting

Technology Performance

Time or Engineering Effort

Performance

[Graph showing the progression of Enterprise A to Enterprise B to Enterprise C with different stages of growth and innovation.]
Technology or Innovation Development and Commercialization May Be Through Simple Imitation/Competition

Example: Web Browser

Microsoft Internet Explorer

Netscape

Mosaic

Time or Engineering Effort

Performance
Technology or Innovation Development and Commercialization May Be Through Acquisition

Performance

Technology Performance

Hostile

Friendly

Enterprise C

PeopleSoft/Oracle
Yahoo/Microsoft

Enterprise B

Cisco et al

Enterprise A

Time or Engineering Effort
Technology or Innovation Development and Commercialization May Be Through Acquisition.
Cycle in Large Corporations

VC

Large Corporation

Startups
Technology or Innovation Development and Commercialization May Be Through Acquisition

![Graph showing technology performance and commercialization timeline with Enterprise A, B, and C, and mentions of Cisco et al., PeopleSoft/Oracle, Yahoo, and Microsoft in a hostile context.](image-url)
Technology or Innovation Development and Commercialization May Be Through Acquisition

Examples: Internet and Enterprise Software

Technology Performance

Enterprise C

Hostile

PeopleSoft/Oracle
Yahoo/ Microsoft

Friendly

Cisco et al
The Entrepreneurial Venture

FOUR STAGES of DEVELOPMENT

Cash Flow vs. Time

I  II  III  IV
The Professional Entrepreneur

Visioning the Future into the Present
Valuation in Steps
Incremental Commitment of Resources

Time

Early Validation

Concept Defined

Market Traction

Scale Validated

Predictable Scale
Staged Financing

- Market Traction
- Scale Validated
- Predictable Scale
- IPO
- M&A
- Early Validation
- Concept Defined
- Series A
- Series B
- Series “n”
Innovating the Green Economy in California

• Challenges
  – Clean Tech markets often require solutions at scale
  – How do we break risk into small chunks to allow entrepreneurial methods to work
    • Niche markets
    • Short time lines / feedback cycles
    • Risk sharing with Gov and major corporations

• It is important to capitalize on our Cluster of Innovation
State of the Industry

- Markets have returned but signals are mixed
  - Recession may be over, but jobs are a concern
  - Housing/new construction remains weak
  - Oil >$75
  - Project Finance/Tax Equity (Anything Solar, Wind)
- Venture investments recovering…slowly
  - 2009 will likely be about 60% of 2008; concentration of deals
Deal Environment – 2009 Trends

• Deal flow highlights:
  • Smart Grid Everywhere
  • Lighting and Energy Efficiency
  • Solar
  • Batteries and Electric Vehicles
• Challenged Areas:
  • Biofuels
  • Waste to Energy
Deal Environment - Fundraising

• Company Perspective
  • Series A Companies
    • Raising less than 2007/8 – valuation and availability issues
    • 18-24 month runway
  • Series B+ Companies
    • Extension of last round with existing investors
    • Raise 1 year ahead of schedule
    • Trying (or tried for) ARRA dollars
    • Avoid raising altogether

• VC Perspective
  • No urgency
  • Syndicates are more important
  • Testing other waters – is the grass greener in other areas?

Investment Off Pace in 2009
Deal Flow and Equity into Venture-Backed Companies

Later Stage Investment Allocation Rises in 2009
Investment Allocation by Round Class (Annual)
California Companies Garner Most Deals

Regional Deal Flow in the United States 3Q '09

- Bay Area: 30%
- Pacific Northwest: 24%
- Southern California: 11%
- New England: 12%
- Texas: 5%
- New York Metro: 9%
- Research Triangle: 1%
- All Other US: 24%

Bay Area Continues to Attract Most Dollars

Amount Invested ($B)

- Bay Area
- New England
- Southern CA
- New York Metro
- Texas

Source: Dow Jones VentureSource
Energy & Utilities Investment Slows Through 3Q ‘09

Investment Allocation by Industry Sector (Annual)

Source: Dow Jones VentureSource

YTD09: 1Q09 - 3Q09
M&As Remain Primary Source of Liquidity in 2009

Percentage Breakdown of Venture Backed Liquidity Events: IPO vs. M&A

IPOs Resumes in US

IPOs Per Quarter, US & Europe

Source: Dow Jones VentureSource
Regulatory & Stimulus – Thoughts

• Effort on Climate / Energy legislation lagging
• First wave of stimulus dollars ending; what’s next?
• From VC perspective, long-term, stable legislation remains important
• States are still playing an important role shaping national energy/climate policy; but budget burdens are slowing things
Where do VC see opportunities?

• Solar – Still a large and growing market
  • Utility-scale opportunities with single digit LCOE
  • Value chain focus
  • Low cost seems to be winning over high efficiency
• Energy Efficiency – Lighting & Controls
  • Value proposition must go beyond energy efficiency
  • Solution must target a “spread sheet” decision-maker
  • Well articulated approach to overcoming past failures
• Storage – Primarily around large scale
  • Proven technology with referenceable field trials
Investment Strategies That Still Make Sense

• Early stage investment valuations remain reasonable

• Capital efficient models are back! <$50M required to build business to liquidity event

• Build strong syndicates to support company through follow-on rounds

• Focus on understanding where there are real customer needs – minimize demand creation
Thank You