



Cleantech Investment Trends and Positioning for Michigan

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Cleantech Group Overview



Cleantech Group LLC Mission

To provide insight, opportunities and relationships that accelerate the growth of cleantech markets and remove bottlenecks to cleantech adoption

Companies

Cleantech Network™: Introduced “cleantech” concept in 2002, popularized it as viable investment category and defined industry segmentation; provides information products and Cleantech Forum™ series of events; has tracked more than \$17B invested in cleantech ventures since 1999, as well as over 1200 M&A transactions and 160 IPOs, of which over \$700M has been raised by Cleantech Forum™ presenting companies.

- Over **1300 affiliated investor members**: 2500+ Forum attendees.
- Formed **Cleantech Network Europe** in 04: now **Cleantech Network China**
- **Cleantech Advisors™**: Assists corporations, investors & governments to develop cleantech markets and opportunities
- **Cleantech Indices™**: Launching cleantech ETFs and other products
- **Cleantech Search™**: Matching talent with cleantech opportunities

Geographic Presence

- Ann Arbor, San Francisco, Toronto, London and Beijing
- Representation in Singapore, Tokyo, Delhi, Stockholm & Tel Aviv

NA & EU Advisory Boards



The Cleantech Megatrend



Enormous Multi-decade Growth Potential

Cleantech encompasses knowledge-based technologies, products and services which:

- **Optimize use of natural resources,**
- **While reducing ecological impact** and
- **Adding economic value** by significantly lowering cost and improving profitability

Problems Seeking Solutions

Invention of Internet and Microchip lead to commercial markets & products:

Cleantech innovation is developing in response to major global problems. Cleantech benefits from tech convergence and cross-over.

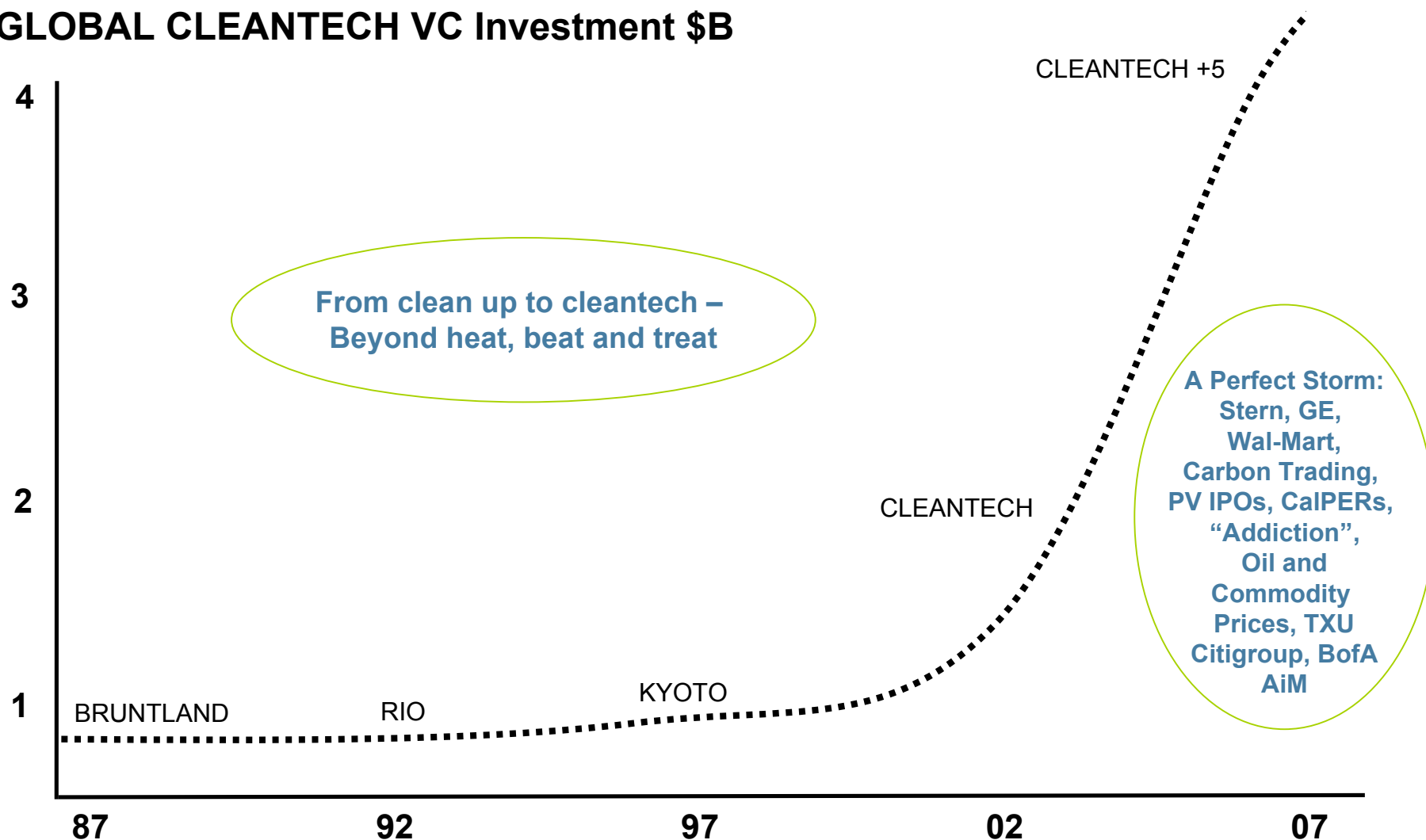
Potentially Ubiquitous Global Applications

- May be biggest job & wealth creation opportunity of 21st century
- Enabling technology of industrial and post-industrial society
- Next and necessary wave of technological innovation
- Fundamental design revolution: reinterpreting relationship with nature

Cleantech – A 20 year Odyssey



GLOBAL CLEANTECH VC Investment \$B



From Cleanup to Cleantech



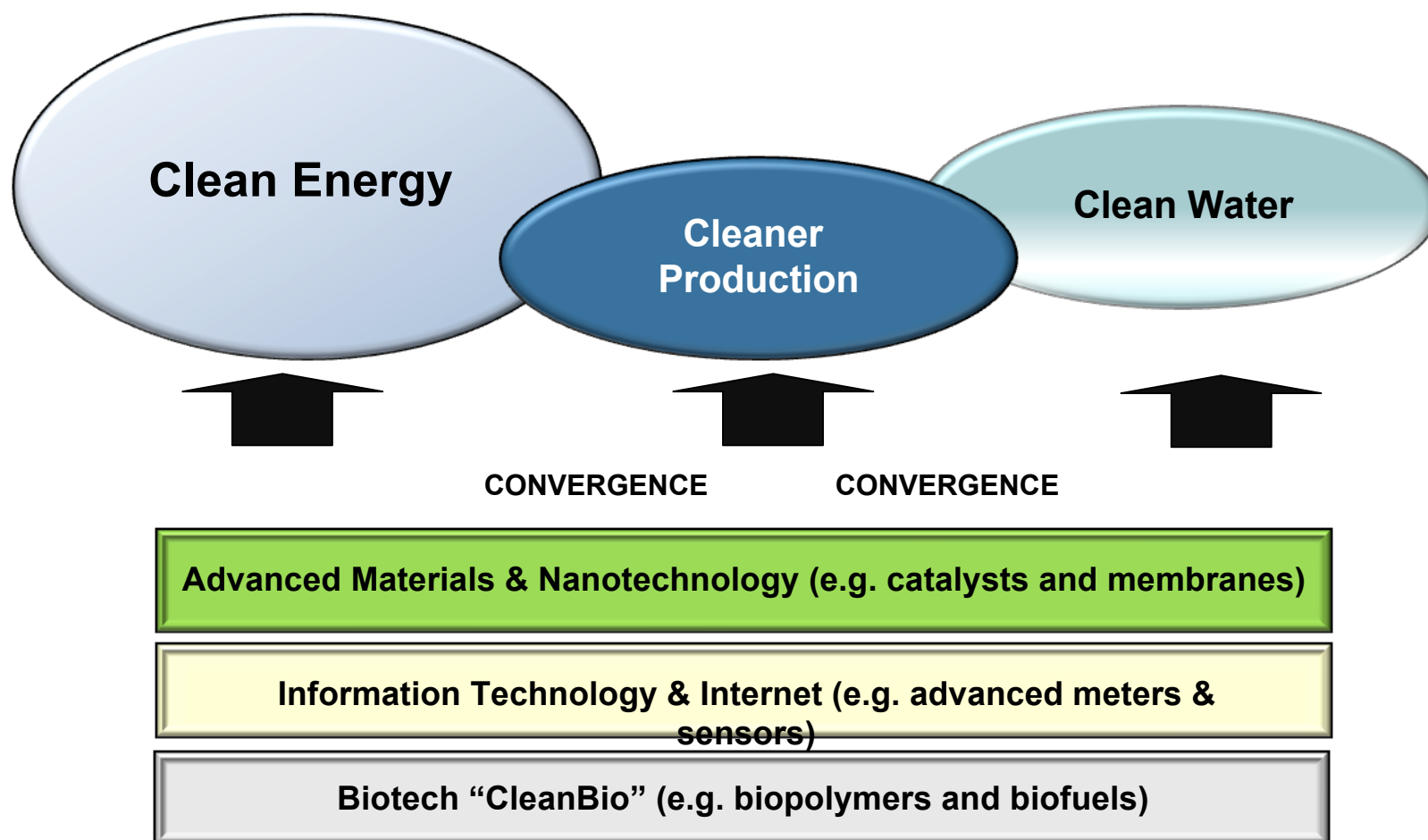
Envirotech 1970s - mid 1990s



Cleantech Late 1990s – Today

- Regulatory driven market
 - Compliance-based purchasing
 - “End-of-pipe” tech, e.g. scrubbers on smoke stacks
 - Chemical science
 - Traditional engineering
 - Slow growth markets, e.g. waste management
 - “Save the world” mentality
 - Low use of IT
- Economic market drivers
 - Productivity-based purchasing
 - “Front-of-pipe” tech, e.g. zero emission plants
 - Biological & materials science
 - Systems design & engineering
 - Rapid growth markets, e.g. solar energy
 - “Entrepreneurial” mentality
 - High use of IT

Technology Convergence



Cleantech Examples



Agriculture - bio-based materials, farm efficiency technologies, micro-irrigation systems and natural pesticides

Energy - distributed and renewable energy generation and conversion (including fuel cells, geothermal, wind and photovoltaics); energy management systems; superconducting transmission; energy storage and power quality; key enabling technologies; and related Internet and information technology-based services

Manufacturing - advanced packaging; high-value materials recovery; natural chemistry; sensors; smart construction materials; and precision manufacturing instruments.

Transportation - hybrid vehicles, lighter materials, smart logistics software and telecommuting

Water - water recycling and ultra-filtration systems (UV and membrane-based systems), sensors and automation systems and desalination equipment

The Importance of Venture Capital



- **VC INDICATOR** of future capital markets activity
- **VC** as generator of **INNOVATION**
- Tradition of bringing **DISRUPTIVE** models and products to market
- “Creative Destruction”
- **VC** as **GENERATOR** of jobs and wealth
- For every \$100M in cleantech VC, 2,500 direct jobs
- Over 1.5M jobs + economic multiplier resulting from current venture investment cycle = **7.5M jobs**
- Shortage of R&D by major corporations impacted by cleantech drivers.

The Next Silicon Valleys



**In the 50's, industry was booming in US Midwest:
who was looking at northern California?**

- Who would have expected more from the “Horn of Plenty” than the a \$150M cash crop of prunes, apricots & cherries?
- In 1953, it seemed foolhardy to break ground on the Stanford Industrial Park in rural Palo Alto
- There quietly began a business revolution that changed our world



The term ‘Silicon Valley’ wasn’t coined until 1971

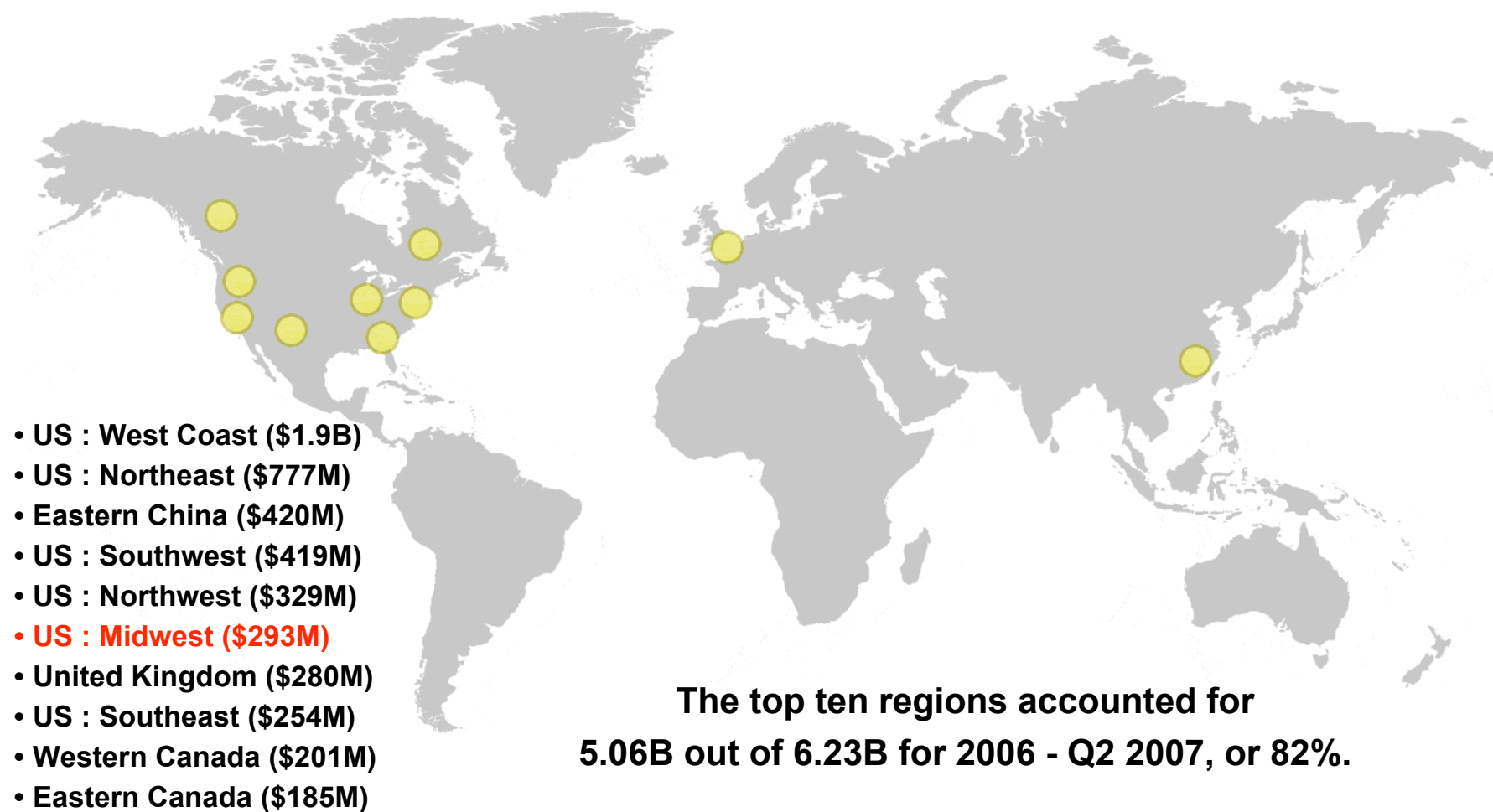
Where will the “cleantech valleys” be located?



Cleantech Top 10 Regions



The Top 10 Cleantech Regions in 2006 - Q2 2007



Cleantech Valley Examples

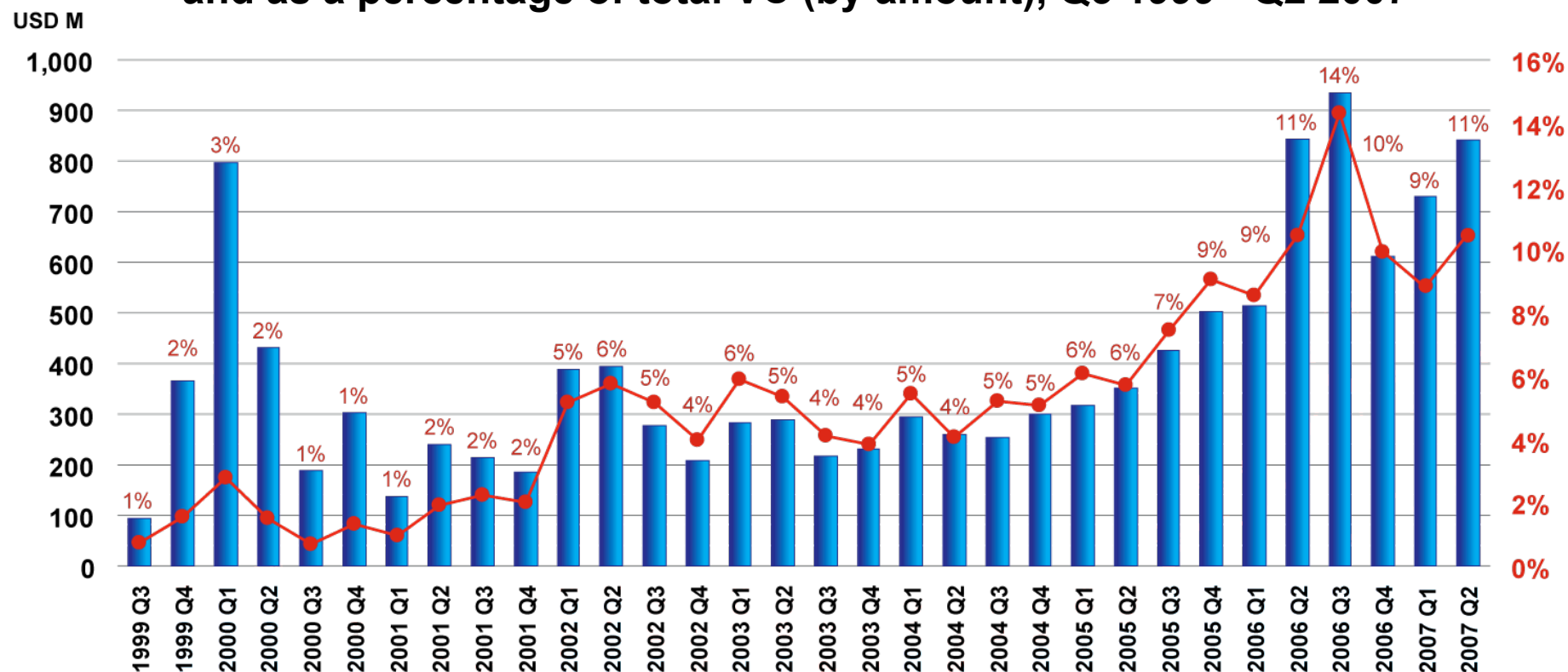


- **Masdar** – Abu Dhabi: commits \$4B for cleantech campus + \$250M investment fund
- **California** – Green Wave, California Cleantech Open, H2 Highway, Solar etc
- **Pennsylvania** – Keystone Green Investment Strategy
- **Xuzhou, China** – \$150M committed to date to Cleantech Park
- **Fayetteville** – Green Valley of Sustainable Logistics
- **Ontario** – Ottawa, GTA and Waterloo clusters, Auto Sector Innovation etc
- **Singapore** – \$700M cleantech R&D program
- **Others** – Austin, Chicago, Portland (OR), Wisconsin, Melbourne, Beijing, Munich, Cambridge (UK), London, Finland, Israel.

North American Cleantech Investments, 1999 - Q2 2007



U.S. and Canadian Cleantech Venture Deals by Quarter and as a percentage of total VC (by amount), Q3 1999 - Q2 2007

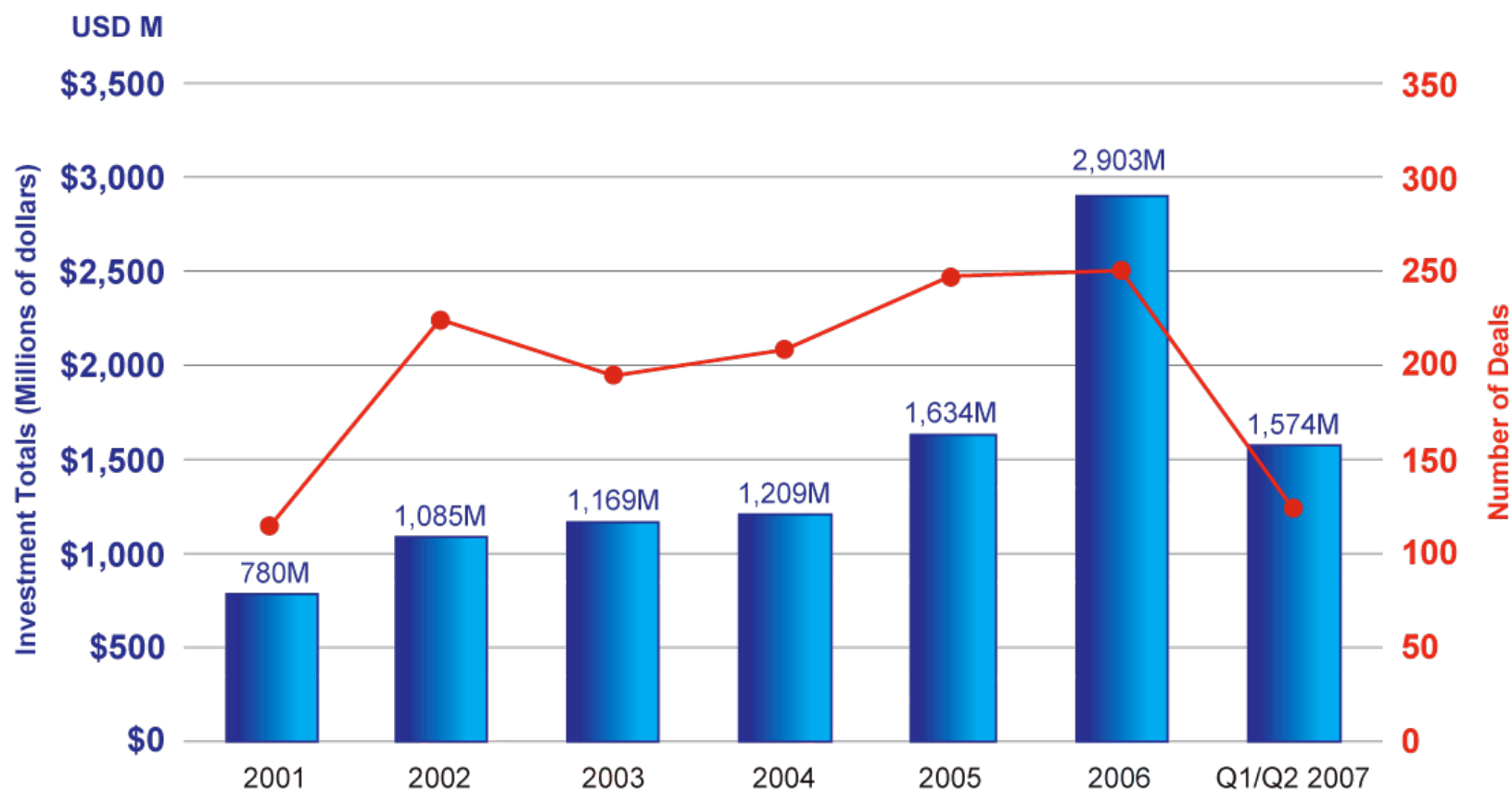


*Cleantech growing as an investment category:
Now receiving 11+% of all VC in North America & Globally*

Cleantech VC Scales Absolutely



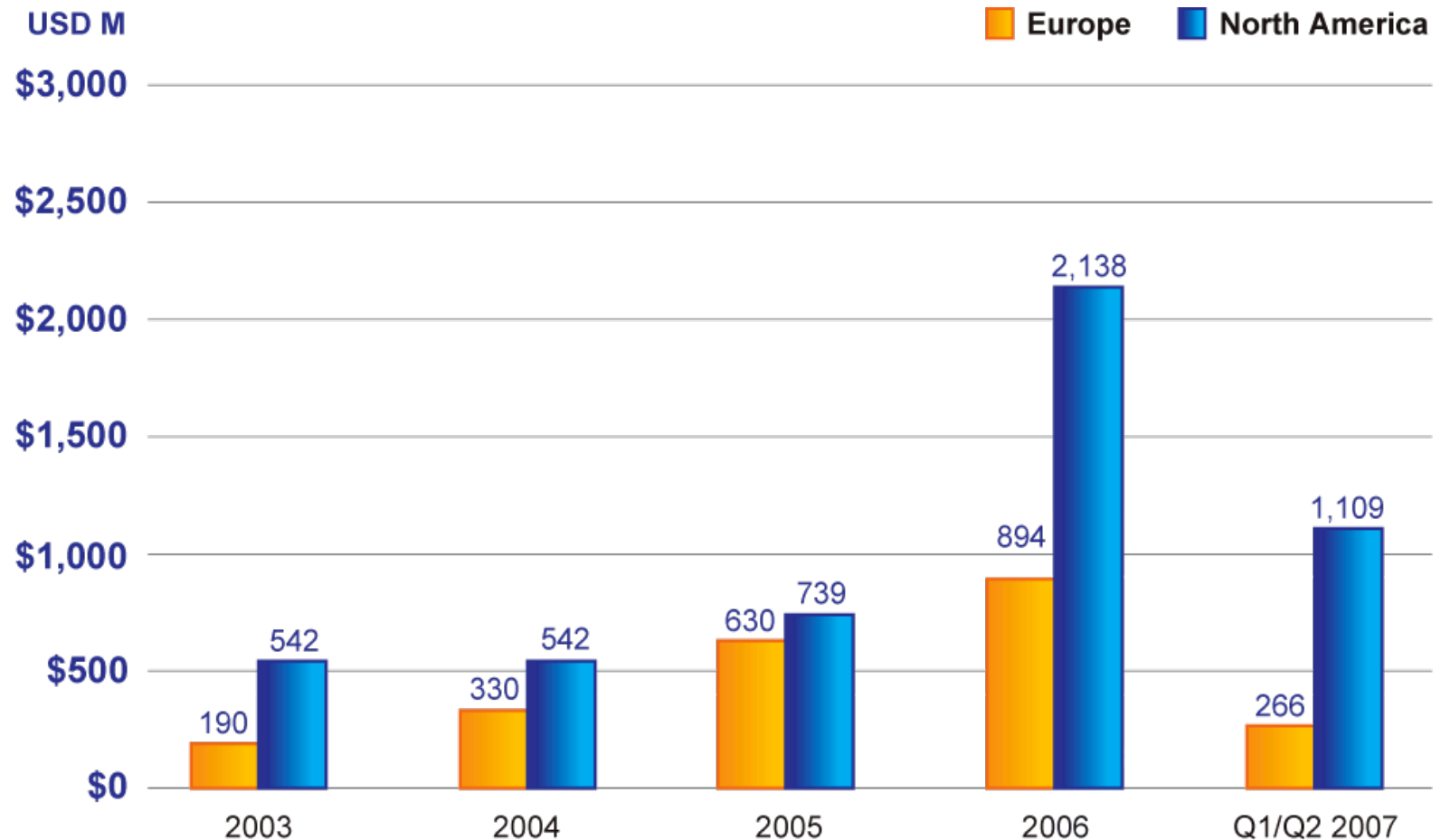
***Annual North American Cleantech Venture Capital Deals and Investment Totals
2001 to Q2 2007 (Millions of dollars)***



Growth in Clean Energy Venture Capital



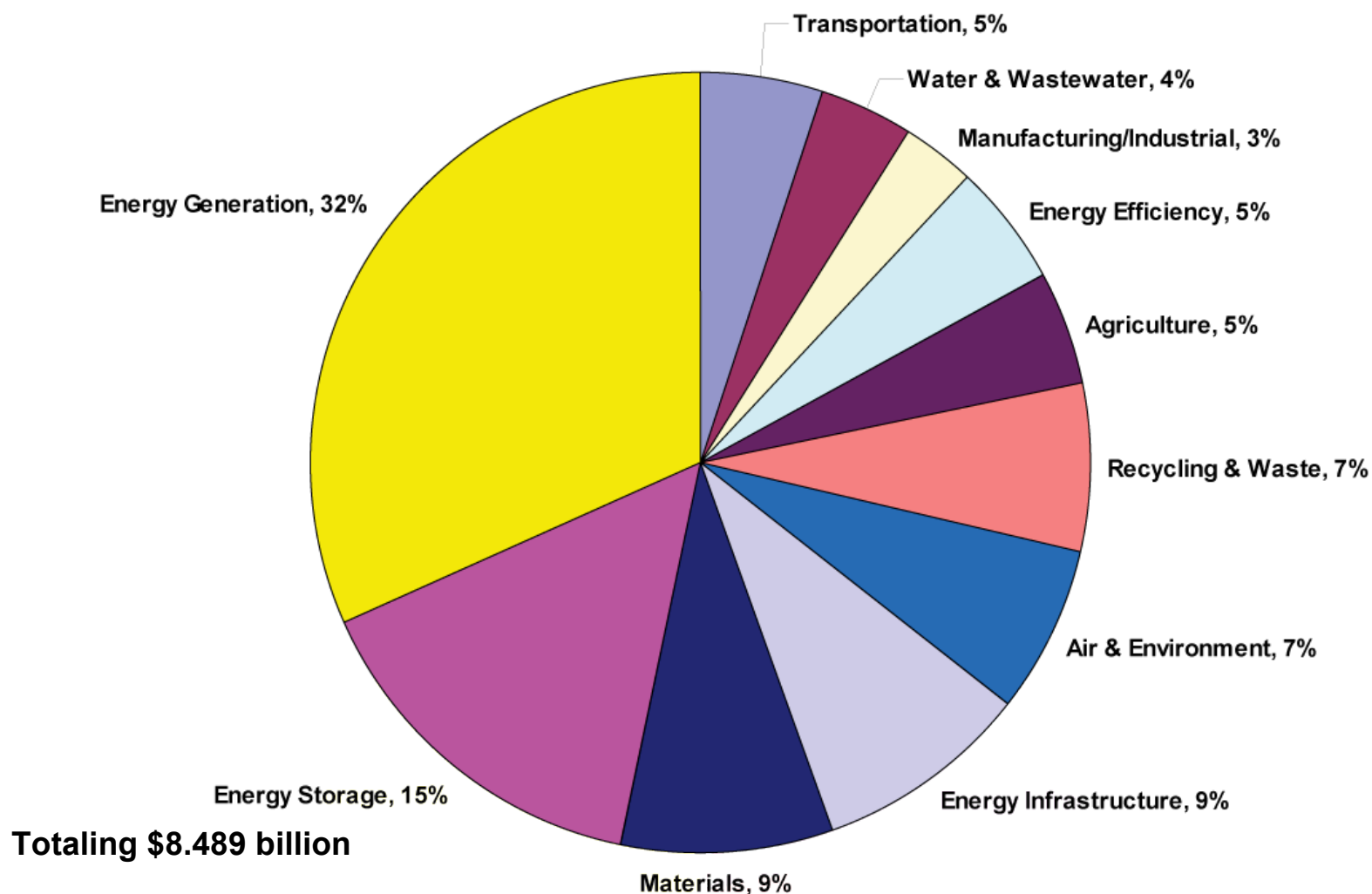
Cleantech VC Investment into Energy: 2003 – Q2 2007



North American Investment by Segment



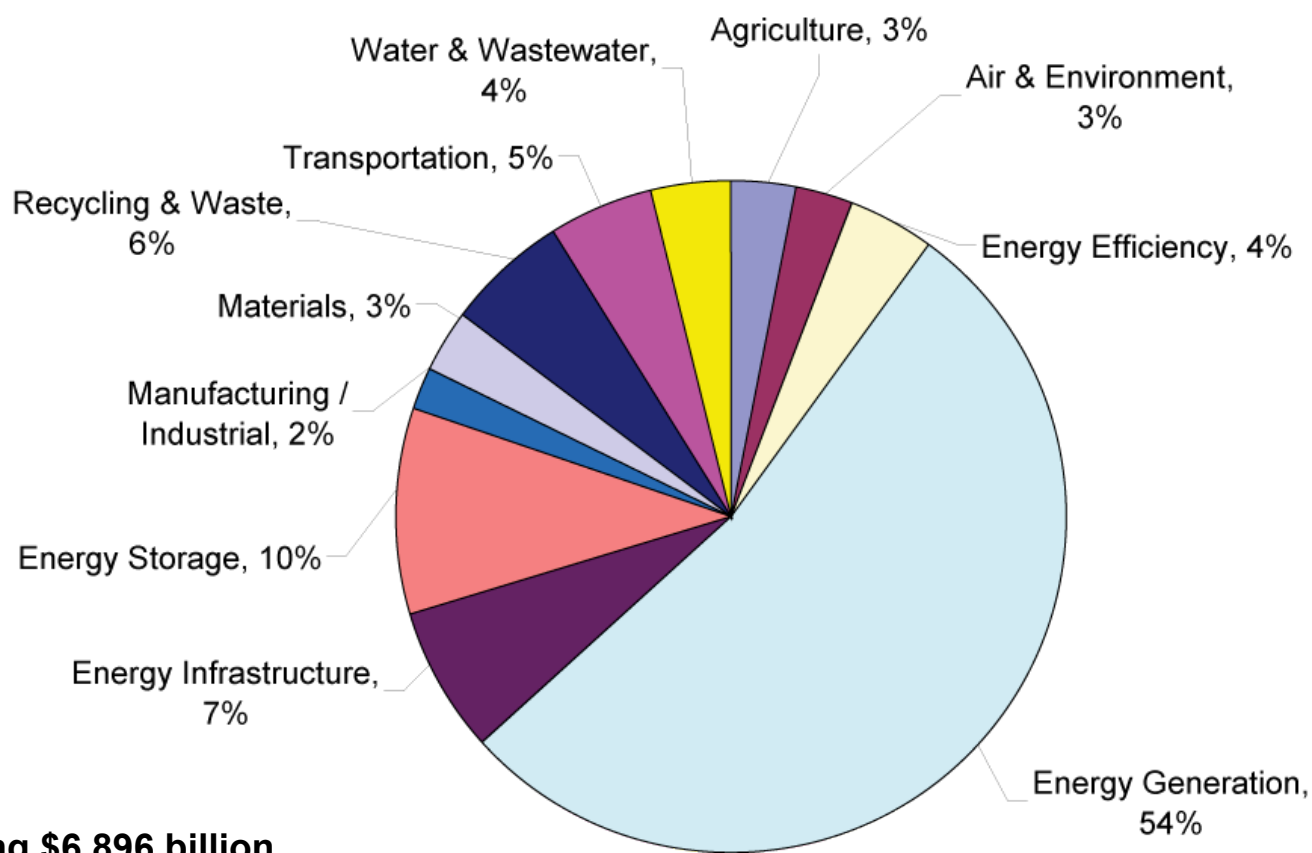
Cleantech Venture Amounts Invested by Segment: 2003 – Q2 2007



Cleantech Venture Capital 2006 & Q2 2007



Cleantech VC by Segment: 2006 & Q2 2007 Worldwide (China, North America & Europe/Israel)

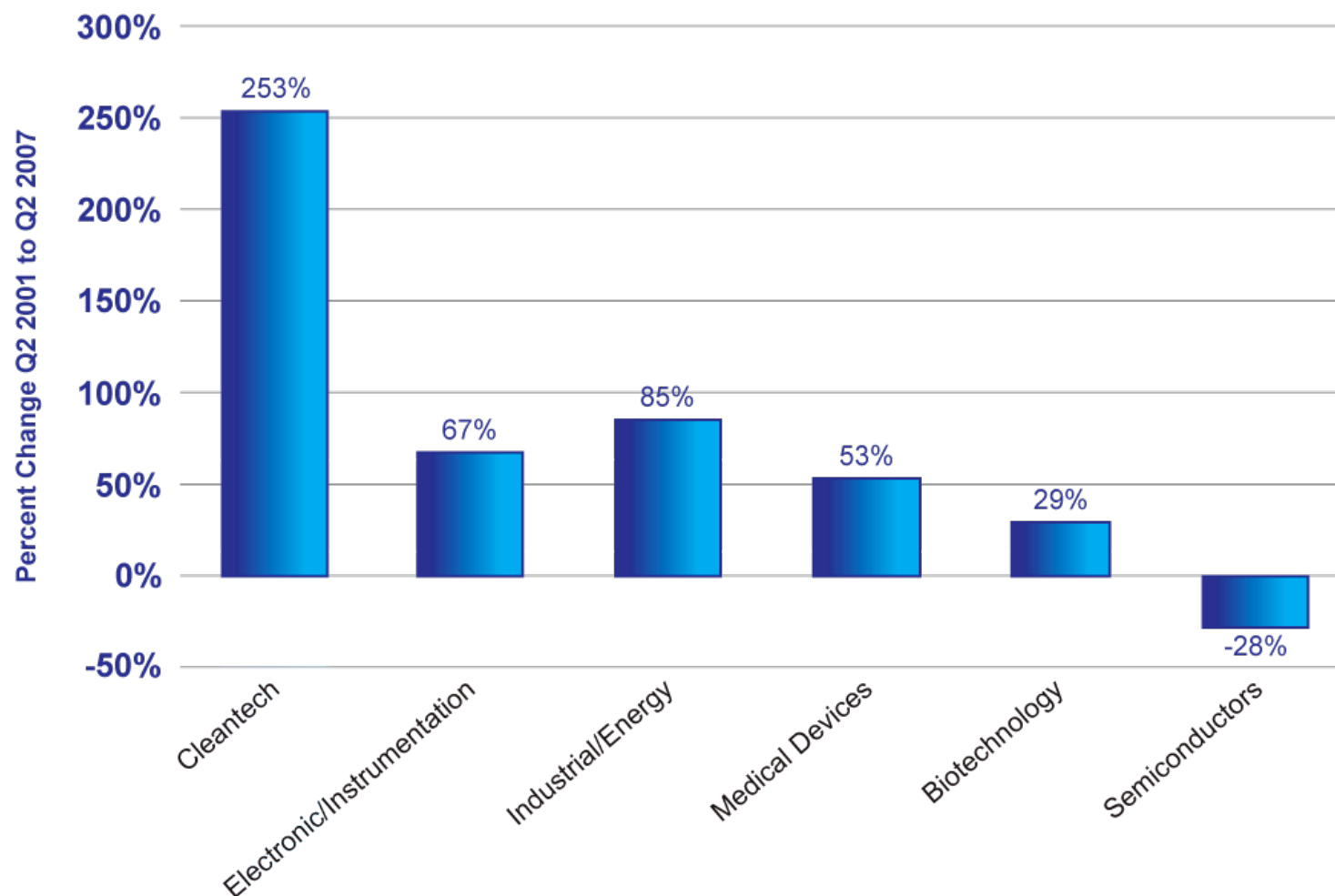


Totaling \$6.896 billion

Cleantech VC Scales Relatively



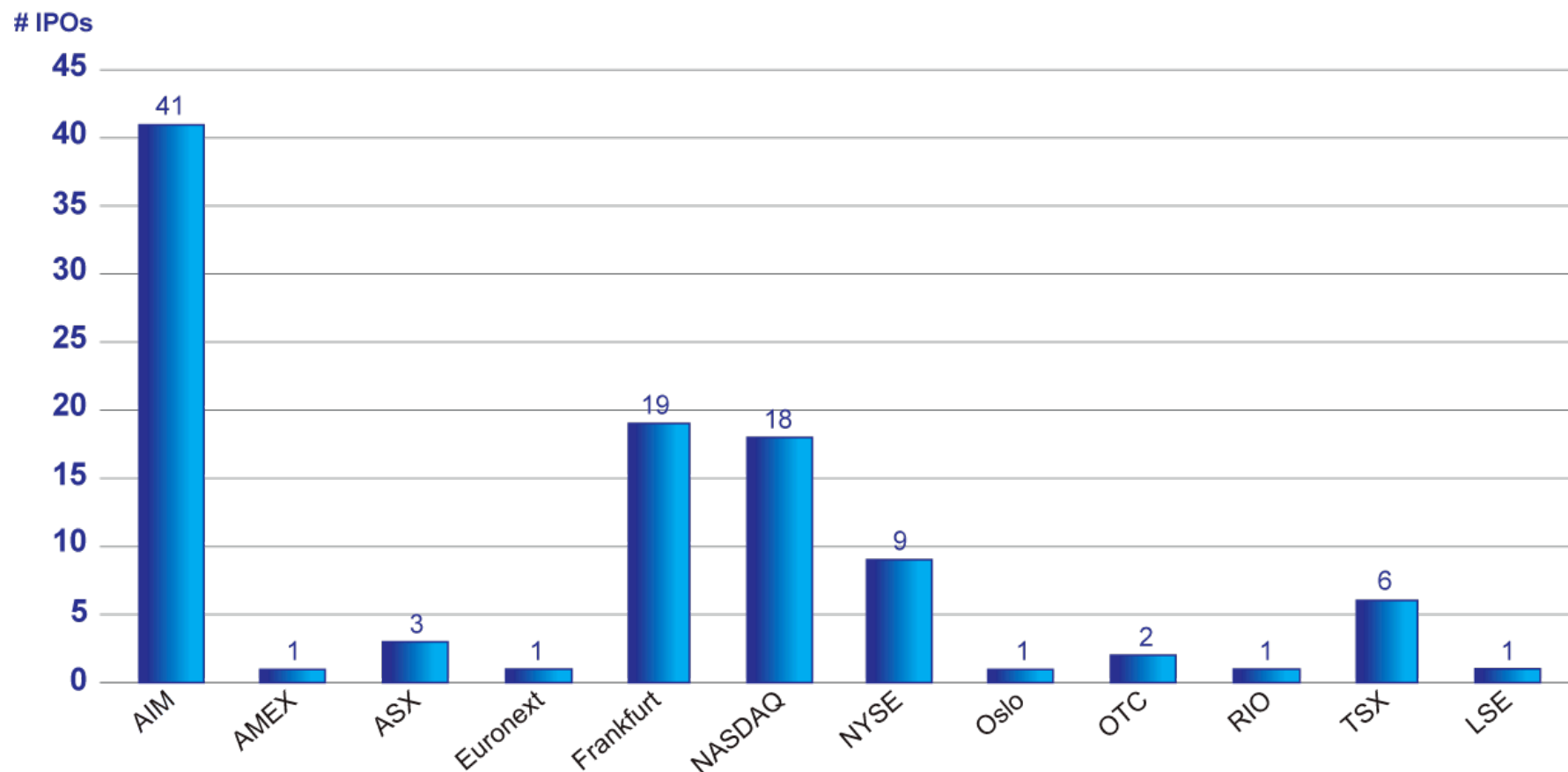
Top 6 U.S. Venture Capital Industries, Percent Change Q2 2001 to Q2 2007



103 Cleantech IPOs Globally 2005 – Q2 2007



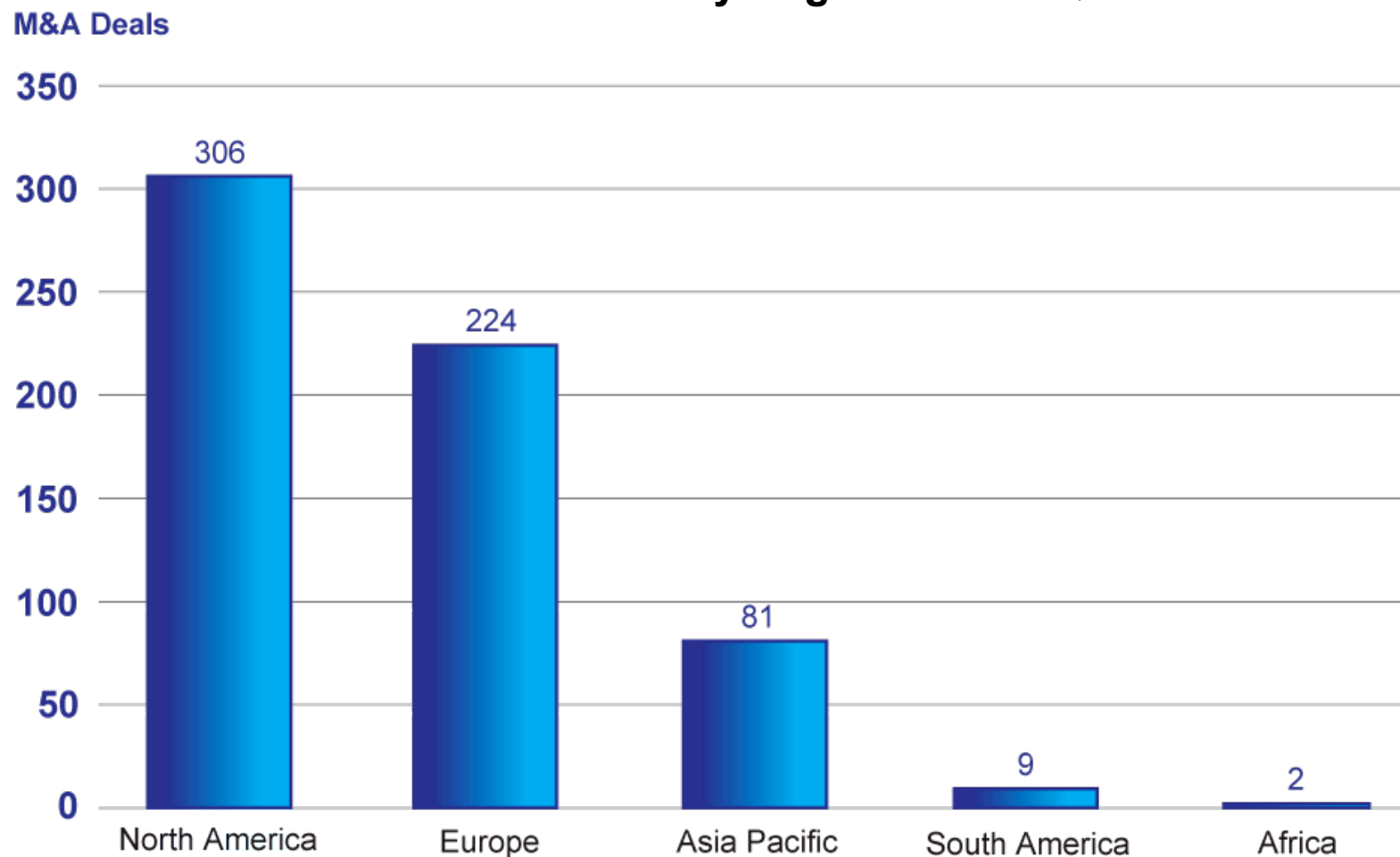
Global IPO's by Exchange 2005 – Q2 2007



Global 2005 – Q2 2007 M&A Deals by Region



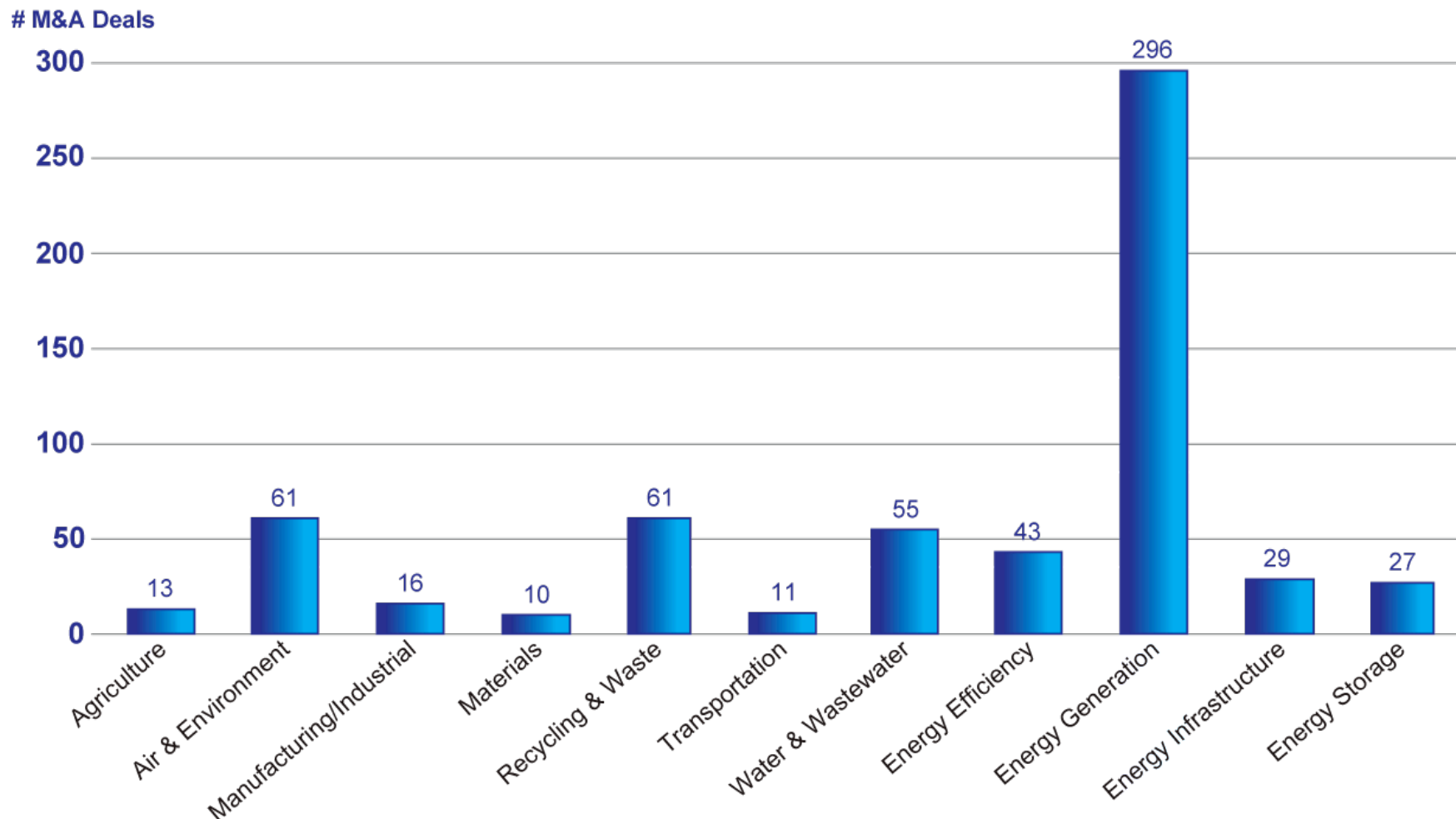
Global Cleantech M&A by Region 2005 – Q2 2007



Global 2005 – Q2 2007 M&A Deals by Segment



Global Cleantech M&A by Segment 2005 – Q2 2007



Cleantech +5



2002



Today

- Define and intro new concept beyond “envirotech”
- Understand key drivers
- Focus on economic grassroots (VC)
- Gather basic data on VC activity
- Generate deal flow
- Bring VCs together with deals
- Encourage capital formation in North America (Silicon Valley)
- 1-3% VC market share

- Cleantech concept and community established.
- Now focused on “innovation” financing – labs to large caps
- Integrating and facilitating global community, esp. China
- Engaging policy makers on new agenda
- Accelerating market adoption
- Building supply chain keiritsu
- 10%+ VC market share

Challenges - General



- **Driving Down Cost!!!**
- **Fostering “serial” cleantech entrepreneurs**
 - Turning ideas into products and successful companies.
- **Building big-small business partnerships**
 - JVs, licenses, R&D, marketing alliances, pilots and demos, investment
- **Creating Linkages between Debt and Equity Markets**
 - Project Finance, Private Equity, VC, Leasing, Carbon Credits.
- **Encouraging appropriate public policies**
 - Less supply-side tech push and more demand side product pull
- **Bringing cleantech to emerging market economies**
 - Harnessing the leapfrog opportunity in hyper-growth economies
 - Developing appropriate tech for BOP

Challenges in Michigan



“overwhelming body of evidence that entrepreneurial economies are dynamic economies that create jobs, prosperity and wealth”

Cleantech Industry - Michigan

- **\$34.7 million in financing since Q1 05**
- **Average of \$5.58 million per deal**

Venture Industry - Michigan

- **Early Stage Venture Investment**
- **Capital Flow**
- **Gap Financing for companies**
- **Programs in Place**
- **21st C. Jobs Fund, MVCA EIR**
- **Automation Alley, Spark, Smart Zones, SBTDC**

Policy with impact



Coordinated Action

Pass a strong long-term Renewable Energy Standard ***simultaneously*** creating incentives for renewable energy development and remove current barriers

Results

- Driving new economic development in Michigan
- Spur investment
- Brings new manufacturing jobs
- Repurpose older jobs/companies and preexisting capital infrastructure
 - manufacturers, tool & die companies, and machining companies can transition to component manufacturing
- Renewable energy sources will directly/positively impact electricity and natural gas prices, tax revenues

Be Bold!



A 20% by 2020 national RES would create over 50,000 manufacturing jobs in Michigan from wind turbine production alone.

Michigan is #2 in the Midwest in wind energy potential, but has less wind installed than Wisconsin, Illinois and Pennsylvania. Along with Minnesota all have RES in place surpassed Michigan in renewable energy development.

The top city in the country for renewable energy is Oakland CA at 17% in 2007.

Other sectors: RE – Biofuels, Solar, Fuel cells

Advanced manufacturing, packaging, supply chain, logistics

Agr – next gen crops and pesticides

Water tech – NSF

Other resources: DOE, DOD, Homeland Security, USDA,

We are all in the same ship!



MISTAKES

IT COULD BE THAT THE PURPOSE OF YOUR LIFE IS
ONLY TO SERVE AS A WARNING TO OTHERS.

www.despair.com

Thank You!



Join the Cleantech Network™,

Attend Cleantech Forum™ XIV in Toronto – October 24-26

Cleantech Forum™ XV in Beijing – December 3-4

Access our leading edge research and advisory services

Talk to us about profitably putting money to work in this space!

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