



Cleantech Venture Investing: Patterns and Performance

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About Vortex Energy LLC

The mission of Vortex Energy LLC is to serve the financial and strategic needs of the energy and environmental technology industries. Together with its investment banking affiliate BOVARO Partners, Vortex offers equity and debt placement, M&A advisory, valuation opinions, and strategic consulting. Past and present clients include public and private energy, power and environmental tech companies at all stages of development, as well as cleantech venture funds and industry organizations.

About the Cleantech Venture Network

The Cleantech Venture Network LLC is an organization that connects venture, corporate and institutional investors with “clean technology” entrepreneurs, through related information products, online services and the Cleantech Venture Forum series of events. We serve more than 500 affiliate investor member firms worldwide. We have tracked nearly \$4 billion invested in cleantech ventures since 2002, of which nearly \$275 million has been raised by Forum-presenting companies. Further information can be found at www.cleantech.com.

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Table of Contents

List of Figures	4
Executive Summary	6
Acknowledgements	10
Section 1. Introduction	11
Section 2. Data Sources and Methodology	13
Section 3. Clean Technology Overview	15
Section 4. Cleantech Activity: IPO Perspective	23
Section 5. Cleantech Activity: Global M&A Perspective	27
Section 6. Cleantech Performance and Value Creation: IPO and M&A Returns Analyses	32
Section 7. Cleantech Performance and Value Creation: Public Market Perspective	40
Section 8. Conclusions	50
Appendix A. Clean Technology IPO Returns — Selected Companies	52
Appendix B. Public Market Analysis: Company Detail	55

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List of Figures

Section 3. Clean Technology Overview

Figure 3.1. From “Envirotech” to Cleantech

Figure 3.2. Environmental Tech and Services Industry Growth, 1980 – 1996

Figure 3.3. Environmental Industry Growth and Venture Investment, 1989 – 96

Figure 3.4. Cleantech Venture Investment vs. Total Venture Investment: 2002 – 2003, By Quarter

Figure 3.5. Cleantech Venture Investment vs. Total Venture Investment: By Quarter, 2002 – 2003

Figure 3.6. Cleantech Venture Investment by Industry Segment, Q1 2002 – Q2 2004

Section 4. Cleantech Activity: IPO Perspective

Figure 4.1. U.S. Cleantech IPOs by Deal Count and Proceeds

Figure 4.2. Selected U.S. Cleantech IPOs by Segment, Deal Count and Proceeds: 1987 through July 2004

Figure 4.3. Selected European Cleantech IPOs 1998-2004

Section 5. Cleantech Activity: M&A Perspective

Figure 5.1. Selected Cleantech M&A Transactions: Deal Count 1990 – 2003

Figure 5.2. Cleantech M&A Transactions: Reported Values, 1990 – 2003

Figure 5.3. Cleantech M&A Transaction Count by Region, 1990 – 2003

Figure 5.4. Selected Cleantech M&A Deals by Cleantech Segment 1980 – 2003

Figure 5.5. Selected Cleantech M&A Deal Count by Cleantech Segment and Transaction Value by Cleantech Segment

Figure 5.6. Top Ten Acquirers by Deal Count

Figure 5.7. Top Ten Acquirers by Reported Transaction Value

Section 6. Cleantech Performance and Value Creation: IPO and M&A Analyses

Figure 6.1. Estimated Returns to Pre-IPO Investors by Year

Figure 6.2. Estimated Returns to Pre-IPO Investors by Industry Segment

Figure 6.3. Estimated Returns to Pre-IPO Investors — Ten Largest Deals

Figure 6.4. Estimated Returns to Pre-IPO Investors — Deals in 2004

Figure 6.5. Estimated Returns to Pre-IPO Investors in Selected European Companies

Figure 6.6. Estimated Returns from Acquisitions of Privately-Held Companies

Figure 6.7. Estimated Returns from Acquisitions of Privately-Held Venture-backed Companies

Figure 6.8. Estimated Portfolio Returns Matrix

List of Figures

Section 7. Cleantech Performance and Value Creation: Public Market Perspective

Figure 7.1. Ten-Year Vortex-Cleantech Index (VCI) Returns vs. NASDAQ, June 1994 – May 2004

Figure 7.2. Ten-Year Vortex-Cleantech Index (VCI) Returns vs. Russell 2000, June 1994 – May 2004

Figure 7.3. Ten-Year Vortex-Cleantech Index (VCI) Returns vs. S&P Small-Cap 600, June 1994 – May 2004

Figure 7.4. Ten-Year Vortex-Cleantech Index (VCI) Returns vs. Other Markets (June 1994 – May 2004)

Figure 7.5. Vortex-Cleantech Index (VCI): One-, Five- and Ten-Year Returns vs. Market Indices

Figure 7.6. Vortex-Cleantech Index (VCI): 1999 – May 2004 Returns vs. Market Indices

Figure 7.7. Vortex-Cleantech Index (VCI) Segments: One-, Five- and Ten-Year Total Returns vs. Market Indices

Figure 7.7. Vortex-Cleantech Index (VCI) Segments: One-, Five- and Ten-Year Returns

Figure 7.8. Cleantech Segment Indices: One-, Five- and Ten-Year Total Return Rankings

Figure 7.9. Long-Term Clean Technology 41 Successes: Financial Growth, Last 12 months vs. 2000, 1995 and 1990

Figure 7.10. Long-Term Clean Technology 41 Successes: Stock Price Performance since 2000 vs. Market Indices

Figure 7.11. Long-Term Clean Technology 41 Successes: Stock Price Performance since 1995 vs. Market Indices

Figure 7.12. Long-Term Clean Technology 41 Successes: Stock Price Performance since 1990 vs. Market Indices

Appendix A. Clean Technology IPO Returns – Selected Companies

Figure A.1. Clean Technology IPO Performance

Appendix B. Public Market Analysis: Company Detail

Figure B.1. Vortex-Cleantech Index (VCI) Components by Segment —Summary Information

Figure B.2. Vortex-Cleantech Index (VCI) Segments: One-Year Returns vs. Market Indices

Figure B.3. Vortex-Cleantech Index (VCI) Segments: Five-Year Cumulative Returns vs. Market Indices

Figure B.4. Vortex-Cleantech Index (VCI) Segments: Ten-Year Cumulative Returns vs. Market Indices

Figure B.5. 41 Companies by Country, Segment and Market Cap

Figure B.6. Long-Term Clean Technology 41 Successes: Financial Growth, Last 12 months vs. 2000, 1995 and 1990

Figure B.7. 41's Stock Price Performance since 2000 vs. Market Indices

Figure B.8. 41's Stock Price Performance since 1995 vs. Market Indices

Figure B.9. 41's Stock Price Performance since 1990 vs. Market Indices

Introduction

Covering 67 initial public offerings (IPO) and 730 merger and acquisition (M&A) transactions from 31 countries over a 15-year period, *“Cleantech Venture Investment – Patterns and Performance”* is perhaps the most comprehensive investigation of clean technology (“cleantech”) investment activity that exists to date.

Our study provides ample evidence that investors in privately held cleantech companies have been able to achieve liquidity. Importantly, estimated returns in a number of cleantech transactions would likely be attractive to the venture investment community.

In addition, we document significant long-term growth in cleantech venture investments, across an increasing diversity of cleantech markets and point to trends that could drive increasing investment flows for the next five to ten years and beyond.

Cleantech Overview

Cleantech is any knowledge-based product or service that:

- Improves operational performance, productivity or efficiency; while
- Reducing costs, inputs, energy consumption, waste or pollution.

The cleantech concept is not specific to a particular industry. Cleantech encompasses air and water purification, advanced materials, distributed power generation, renewable energy and process controls. Cleantech markets represent annual global revenues greater than \$150 billion, and segments such as wind and solar power boast 5 – 10 year compound annual revenue growth rates as high as 35%¹.

Cleantech venture investment flows have been rising. From 1994 through 2003, an estimated \$8 billion of venture capital was invested in North American cleantech companies². Before 2000, cleantech venture investment averaged approximately \$350 million per year, while from 2000 — 2003, annual outlays averaged more than \$1 billion. Nearly half of the \$8 billion total was invested in the last three years.

Cleantech Exits

Prior to 1995, cleantech investment and exit activity focused on environmental technologies and services, such as pollution control, remediation and hazardous waste management. Increasingly, clean technologies are developed primarily to meet an economic need; their environmental benefits are a significant but secondary consequence. As such, cleantech is increasingly distinguished from its historical antecedent, “environmental technology”, which is narrower in scope and based more on regulatory requirements than market incentives. As these changes occur, money has been invested into an increasingly broad range of cleantech companies, and the value and volume of cleantech venture entries and exits has grown.

¹ Banc of America Securities, Diesel & Engine World, Environmental Business Journal, Cleantech Venture Network LLC, European Wind Energy Association, Itron, MGE, MicroTech Consultants, Photon International, Powerzyme, Solicore, U.S. Census Bureau, U.S. Energy Information Agency, U.S. Environmental Protection Agency, Vortex Energy LLC.

² Cleantech Venture Network LLC, Nth Power, PWC Moneytree Survey, Vortex Energy LLC.



Executive Summary

Our study incorporates data from hundreds of liquidity events, both initial public offerings and M&A transactions. With respect to IPOs:

- Cleantech IPOs have tended to come in waves. Environmental companies led the early wave of offerings, followed in 1999 – 2000 by distributed and renewable energy deals, and most recently by power conversion companies.
- Deal count grew from nine between 1987 and 1995 to 58 between 1996 and Q2 2004.
- Distributed and renewable energy IPOs have been particularly well received in Europe, probably reflecting the exceptional growth rates of the European solar and wind power industries.
- Beginning approximately four years ago, dedicated energy and cleantech funds started contributing regularly as pre-IPO investors in cleantech companies filing to go public. The increasing number of IPOs from the portfolios of dedicated funds suggests that cleantech venture investors, in some cases, have successfully built companies able to compete in public equity markets.

Looking at M&A activity:

- The value and volume of cleantech M&A transactions more or less followed stock market trends. Deal activity peaked in 1998 – 2000, declined sharply in 2001 – 2002, then started to improve in 2003.
- Deal count went from 117 between 1990 and 1995, to 613 between 1996 and 2003.
- In most years, three industry segments — instrumentation and process controls, electrical equipment and power conversion — accounted for half or more of all M&A deals in our database.
- Since approximately 2000, there has been a substantial increase in deal count in the clean fuels and combustion, distributed and renewable energy, energy and environmental information technology, energy storage and water and fluid treatment segments.

Cleantech Returns

The primary focus of this report is the data on exits. On a more speculative basis, we estimated returns realized by investors in privately-held cleantech companies through IPOs and mergers and acquisitions. From a sample of 56 publicly-traded U.S. cleantech companies, we found the following:

- Median estimated returns were 433%, or about 5.3x invested capital.
- Performance very closely replicated broad market trends. Estimated returns to pre-IPO investors were highest in 1999 – 2000 during a public market bubble in certain cleantech segments.

Executive Summary

Based on the 21 M&A transactions for which we collected sufficient data, we found that:

- Cleantech acquisitions returned a median 4.1x invested capital.
- Venture-backed cleantech companies generated returns of 2.5x, below the overall average, as several “dot-com-style” investments decreased overall performance.

To translate returns multiples into an estimated internal rate of return (“IRR”), we constructed a hypothetical portfolio of cleantech venture investments comprised of the 56 IPOs and 21 M&A transactions referred to above. We based our assumptions for realized returns on our estimates of return multiples from cleantech IPOs and acquisitions from 1994 – 2003. With additional assumptions about holding period and write-offs, we could estimate the hypothetical portfolio IRR:

- From realized returns on 60% of the fund and a 40% write-off rate, our hypothetical portfolio returned an estimated 6.2x invested capital.
- Given an average holding period of five years, the hypothetical portfolio delivered an estimated IRR of approximately 30%. Assuming instead a seven-year holding period, the IRR would be roughly 20%.

Public Company Analysis

Given the scarcity of data on venture-backed, privately-held cleantech companies, we utilized data from the public markets to evidence the ability of cleantech companies to generate long-term shareholder value. As part of that process, we created the *Vortex-Cleantech Index (“VCI”)* and 11 associated segment indexes, based on a basket of 182 U.S.-traded cleantech stocks with a combined market cap of nearly \$100 billion.

- Over the ten years from June 1994 to May 2004, the VCI (+267%) outpaced both the NASDAQ (+181%) and the Russell 2000 (+146%).
- The VCI’s positive performance was built on a broad foundation — no single industry segment dominated overall performance. The overall index traded well relative to the market because most of the cleantech segment indices traded well.

However, VCI performance does not directly address the issue of cleantech company financial performance. Therefore, we searched for cleantech companies with long records of growth in sales and earnings, as well as shareholders equity. We assembled a universe of more than 41 “cleantech successes,” representing a broad range of sizes, industry segments, and geographies. While some became known to the public in more recent years, all have operating histories that extend back at least a decade or more.

- The 41 companies in the “cleantech success” universe have an aggregate \$30 billion in annual revenue, \$2 billion in net income and \$53 billion of market capitalization. They represent a dozen countries on three continents, and operate in nearly every cleantech industry segment.

Executive Summary

- 16 of the 41 “cleantech successes” have been public since 1990 or prior. From 1990 to mid-2004, these 16 posted compound annual revenue growth of 10%, and net income growth of 15%. For comparison, over the same time horizon, revenue from global semiconductor shipments increased at the same 10% rate.
- Whether the starting point is 1990, 1995 or 2000, the average share price of the “cleantech successes” outperformed the NASDAQ and the Russell 2000 in virtually every time period.

Catching the Cleantech Wave

We note a number of macro trends that should support cleantech as a viable venture investment category for some years to come, including:

- **A confluence of events** such as high and volatile oil prices, the coming into force of the Kyoto protocol and less expensive and more reliable alternative energy technologies.
- **Increasing interest by major corporations** in adopting clean technologies to drive productivity and reduce waste.
- **Local and national policy initiatives** such as renewable energy portfolio standards for utilities, subsidies for wind and solar power systems, and “green building” and environmental procurement requirements for government agencies that create demand for cleantech solutions and kickstart the virtuous cycle of “volume increase \Rightarrow cost reduction.”
- **Advances in science and engineering** that make numerous clean technologies increasingly economical.
- **The rise of serial entrepreneurs**, whether from other cleantech enterprises or from other technology industries, who introduce innovative business techniques and models, provide valuable insight gleaned from operating experience, and enhance the overall quality of the management pool.
- **A level playing field for investor attention** based on more realistic holding periods and returns expectations following the bursting of the dot-com bubble.

The full report “*Cleantech – Venture Investment Patterns and Performance*” provides extensive data analysis, including 47 tables.

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