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Presented by Michael DeRosa of EnerTech Capital at the West Virginia Hydrogen Workshop on November 19, 2003 at Stonewall Resort, Roanoke, WV. This meeting was a part of the Energy Roadmap Workshop Series commissioned by West Virginia Governor Bob Wise.





West Virginia Energy Roadmap – Hydrogen Workshop

**Michael DeRosa
EnerTech Capital**

Introduction to EnerTech Capital

Background

- **Founded in 1996**
- **Located in Wayne, Pennsylvania (just west of Philadelphia)**

Focus

- **Principally energy (60%) and communications (40%)**
- **Software, technology, and services companies (no utility assets, no commodities)**
- **Early-to-expansion stage**
- **Primarily U.S. companies**
- **Typically lead investor; active on boards**

Management

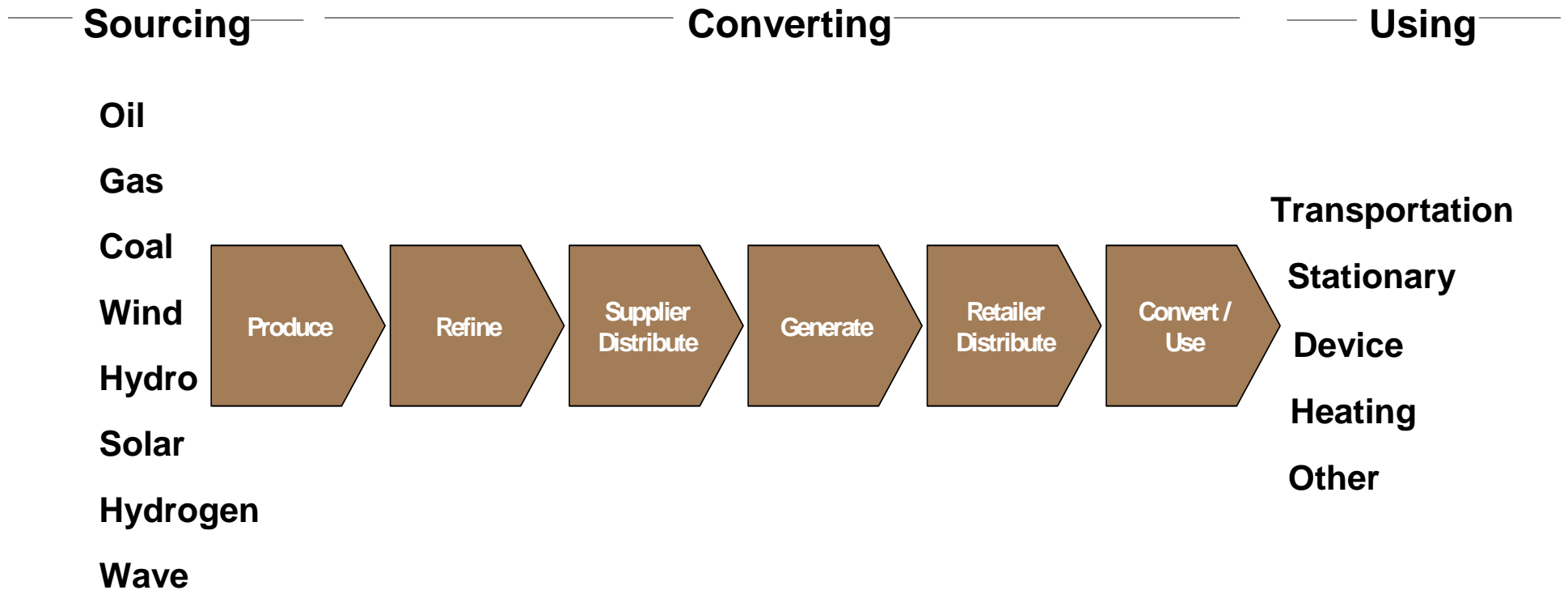
- **Deep private equity expertise and industry operating experience**
- **Strong brand name, access, and deal flow; known as a founder of energy tech space**
- **Disciplined investment approach**
- **Proprietary communities of interest / strong industry ties**

Track Record

- **ECP I (1996): 48% IRR, more than \$120 million distributed on \$56 million committed**
- **ECP II (1999): strong portfolio, \$20 million of exits on \$234 million committed**



EnerTech looks for technology driven investment opportunities across the complete energy value chain from production to end-use



“Hydrogen Economy” technologies are just one of many areas that we are currently interested in

Current Focus Areas

- **Clean Coal and other emissions control technologies**
- **Advanced Batteries**
- **Device Power (including small scale fuel cells)**
- **Fuel Cells**
- **Hydrogen generation and storage technologies**
- **Renewables – Wind/Photovoltaics**
- **Superconductivity**
- **Advanced Catalysts**
- **Clean Fuels and Fuel Additives**
- **Transmission Grid Congestion Management**
- **Demand Side Management**

Definitions vary, but most VCs consider “Hydrogen Economy” to mean H₂ fuel cells for transportation



Venture Capital investment and interest in the hydrogen economy has increased despite substantial risk factors

Activity

- **Substantial federal government creates a basis for venture investments**
- **Numerous fuel cell companies funded by private and public investors--Ballard Power Systems, market cap of over \$1.5B**
- **Hydrogen generation also garnering VC attention--H2Gen and Hyradix recently received venture funding**
- **Hydrogen storage is of interest--Millennium Cell**
- **Multiple large venture funds are now focusing on the sector**

Investment Considerations

- **Market adoption is not in the near term**
- **Interface risk – multiple problems with production, storage, distribution, power conversion for any one pure play H₂ economy company to thrive**
- **Total infrastructure investment could reach \$1T**
- **High inherent costs of vehicle fuel cells**
- **Will the H₂ economy really lessen emissions (depends on how the H₂ is produced)?**
- **Impact of widespread H₂ economy on natural gas supplies and prices**

As overall public and private investment increases, companies offering solutions to these risk factors will be highly valued



To capitalize on this potentially massive market while mitigating the associated risks, EnerTech seeks companies that serve multiple markets

“Horizontal” Hydrogen Economy Deals

Definition

- **Companies that have solutions that are applicable to current markets to mitigate risks, but will also play a significant role in the hydrogen economy**

Examples

- **An advanced chemical and biological sensor company that has hydrogen sensors in its diverse range of products**
- **Catalyst companies that offer solutions for a range of markets including hydrogen powered fuel cells**
- **Hydrogen generation technologies that are cost competitive in existing hydrogen markets**
- **Diversified materials technologies that can be applicable to hydrogen storage**
- **Clean coal or other emission control technologies that are applicable today and can solve the “well to wheel” hydrogen economy emissions issues**



Venture Capital can play an important role in the development of the hydrogen economy in a given region

Impact of Venture Capital

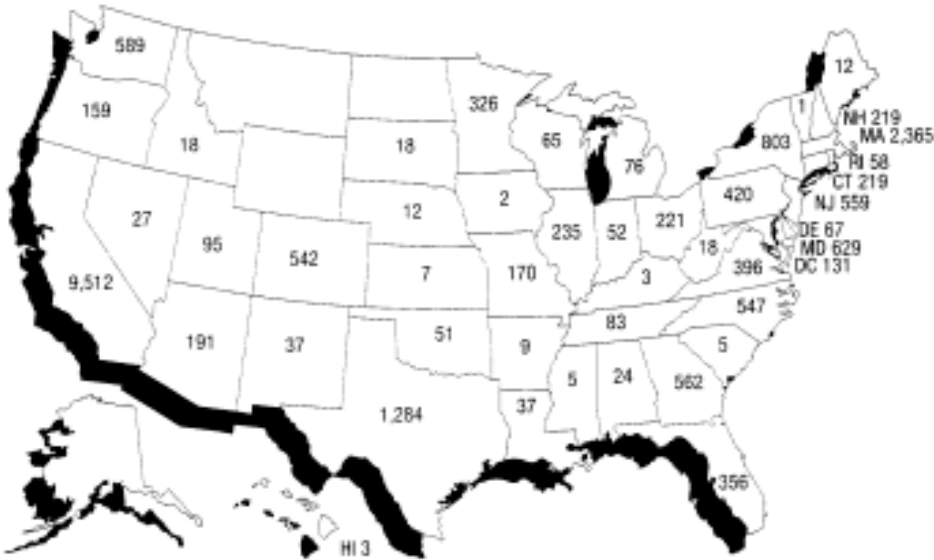
- **11% of U.S. GDP and one out of every nine jobs was generated by companies that were originally venture-backed**
- **Every \$36,000 of venture investment creates one job**
- **In 2000, originally venture-backed companies exported goods and services worth \$21.7 Billion, paid federal taxes of \$58.8 Billion, and conducted \$157.3 Billion of Research and Development**
- **Venture capital has been a significant driver of innovation “across a broad swath of the U.S. economy including biotechnology, consumer products, retailing, construction, transportation, industrial, financial services, and forestry.”**

*Source: National Venture Capital Association;
DRI-WEFA study on Impact of Venture Capital*

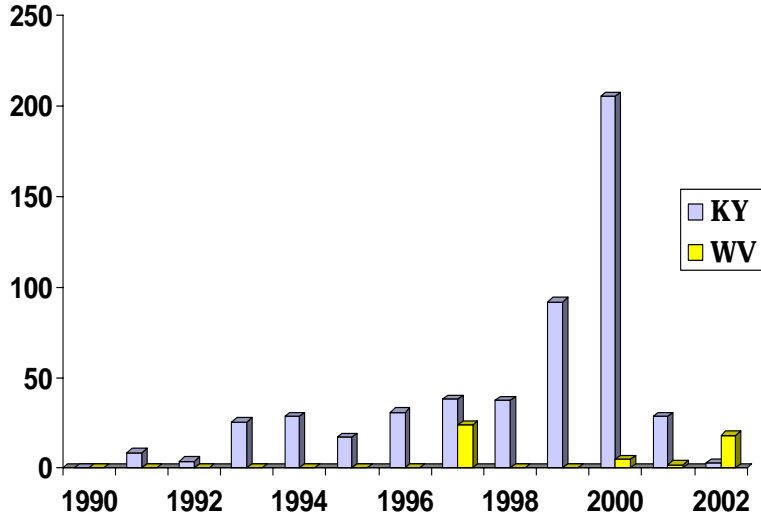


Unfortunately, West Virginia lags behind even some of its comparable neighboring states in attracting venture investment

Amount of Capital Invested By State in 2002 (\$ Millions)



Venture Capital Investments 1990 to 2002 \$ Millions



- West Virginia ranked 49th in jobs represented by venture backed companies with only 252 jobs (year 2000 data)
- California had 1.4 Million jobs; Pennsylvania had 425,000; Kentucky had 32,000

Source: National Venture Capital Association; DRI-WEFA