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The Leeds School of Business has several collaborative relationships with federal agencies, such as the National Renewable Energy Laboratory (NREL). (Ponnequin Wind Farm photo by Warren Gretz.)

Sustainability: What's This Have to do with Opportunity?

Paul J. Jerde

Sustainability has become a pervasive topic of conversation, speculation, skepticism, and confusion. Why has the topic risen to such a high point of interest and heightened level of awareness?

What is causing companies such as Prologis, the fifth largest public company in Colorado, to feature only one word—*sustainability*—on the cover of its annual report? What is leading Wal-Mart to require each of the tens of thousands of suppliers in its supply chain to develop a sustainability plan, and to intend to become one of the world's largest sellers of natural and organic (sustainable) foods? And why has Sun Microsystems focused on sustainability as the theme of its marketing campaign for its new SunRay™ line of servers?

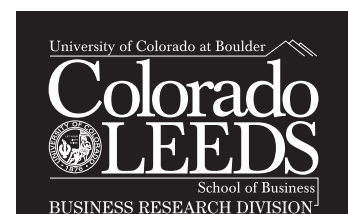
When GE announced its ecomagination initiative it declared its intentions to invest well over a billion dollars in research and development to develop new products, services, and solutions

that would enable its customers to become more sustainable. GE neither attempted to define sustainability, nor did it apologize for using it—as indefinite as it might be. GE did state that it believes that these new products, services, and solutions will generate billions of dollars of new revenue.

The drivers are innumerable, which is evidence of heightened awareness of the nonsustainable ways in which we have been using all resources. Whether driven by fears of climate change research, an increasingly realistic assessment of the exploding global competitive appetite for energy of all types, or new designs for affordability that are pushing the prices of products and services down to reach new markets in developing countries, individuals, corporations, and entrepreneurs are finding that the sweeping changes occurring from sustainability initiatives are creating extraordinary opportunities.

Sustainability is many things. It is appearing in businesses of all types, including natural and organic foods (an industry that was founded on the premise of sustainability), the automobile industry, the computer industry, and the energy industry. It is appearing in the full span of technology to nontechnology-based companies. It is appearing in firms of all stages, from multinational corporations to entrepreneurial startups.

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Think Broadly.
Act Boldly.



Strange Bedfellows and New Opportunities

J. Alexander Sloan

From the Editor

This issue focuses on sustainability and clean technology in both Colorado and the nation. This six-article “jumbo edition” addresses this topic from both the public and private sector perspective. In the lead article, Paul Jerde discusses the challenges of sustainability and suggests that these “challenges” will provide many economic opportunities for the creative entrepreneur. The second article, by J. Alexander Sloan, provides some insight into the clean technology area as viewed by the national venture capital community. “Sustainable Enterprise and Entrepreneurship,” by Associate Professor Stephen Lawrence, discusses the future of cleantech and the role of entrepreneurship. Peter Edwards of Altira Group provides a Colorado perspective on energy and energy technology investment in the fourth article. Lawrence M. Murphy provides a federal government perspective in the fifth article. The issue concludes with an interview with Chris Andersen, Leeds School alumnae, by Alison Peters. Andersen stresses the need for strong economic and market rationale to further cleantech interest and investment.

The staff of the *Colorado Business Review* attempts to provide useful, topical information to the Colorado business community. We are interested in your suggestions of topic areas and article submissions. I welcome your comments and suggestions for future issues of the *CBR*. Please call me directly at 303-492-1147.

—Richard L. Wobbekind

Within the sustainability movement, the demand for clean technologies is growing and attracting a diverse group of players to the table. Entrepreneurs, technologists, corporations, social activists, environmental advocates, academics, researchers, venture capitalists, and investment bankers are working together in new ways, and perhaps for the first time, within the burgeoning cleantech sector.

In the past, the term *cleantech* was little used, and when it was, it primarily described technologies around manufacturing waste management and environmental cleanup. However, consumer awareness has recently reached a tipping point around health. We are increasingly aware of and concerned about our health and that of our families, our communities, and our planet. These concerns are evidenced in shifting purchasing behaviors and the growing demand for products and services that serve our desire for better health. Coupled with concern over climate change, high fuel prices, and more efficient use of natural resources, this health and wellness trend has created an increasing need for products and services that are expanding the definition of cleantech and the community of those interested in its potential.

Cleantech now comprises a diverse and growing range of products, services, and processes that enhance the sustainable use of natural resources, lower the cost and waste in the product life cycle, and improve product performance. This is accomplished while reducing or eliminating negative environmental impact and without reducing our capacity to provide for future generations. Companies are responding to discernible and rising consumer demands for innovative products in areas such as:

- Alternative energy (e.g., photovoltaic solar cells)
- Food production and packaging (e.g., healthy choices and recyclable/biodegradable packaging)
- Clean air and water (e.g., point-of-use filters and real-time monitoring of water systems)
- Energy efficient transportation (e.g., hybrid cars and biofuels)
- Environmental management (e.g., product life cycle management and reduced manufacturing waste)
- Complementary healthcare (e.g., supplements and nutraceuticals)

Investors, innovators, large companies, social and environmental advocates, and researchers see growing demand in these areas and the potential to

profit from cleantech solutions that respond to these trends. In the past, and even still to a degree, some of these constituencies saw little common cause and even worked against each others' interests. Typically, environmentalists have viewed corporations as evil polluters. Investors and businesses have viewed environmentalists and social advocates as likely to damage financial returns. Technologists have focused on processes and efficiency improvements, with little regard for waste or environmental impact. As well, individuals have faced a career choice of working to do good or do well, but rarely have been able to do both. While prejudices are hardly gone, these disparate players are beginning to see opportunities to share their passions and work together.

Participants in cleantech are redefining the concept of “profit” to encompass more than only financial results. In his book *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*, John Elkington coined the term *triple bottom line* to address the concept of seeking positive financial, environmental, and social returns on a given product, company, investment, or portfolio.

One challenge in trying to account for the environmental or social results of a commercial endeavor is how to quantify results and compare them across diverse efforts. Another challenge is that typically all three triple bottom line factors are not pursued in parallel. Sometimes creating positive effect on two or all three of the factors is seen as incidental or “nice to have,” but not the priority. In the business and investment sector, financial returns clearly have had priority over positive environmental or social results. Social and environmental leaders have sought improvements in these arenas with little regard to financial cost or impact on profitability.

A benefit of the emerging cleantech mindset is that an awareness of all three factors comes to the fore. An effort cannot be deemed cleantech or sustainable if some triple bottom line factors show results at the expense of the others. The traditional trade-offs are no longer acceptable, such as profit at the expense of the environment (e.g., unabated manufacturing pollution) or positive social impact at the expense of competitive financial returns (such as some socially responsible investing [SRI] equity funds). Cleantech venture funds are raising capital from investors on the expectation of portfolio returns competitive with those of other venture

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Sustainable Enterprise and Entrepreneurship

Stephen R. Lawrence

There is growing commercial interest in environmentally and socially sustainable technologies and services, which, in aggregate, are often called *cleantech*. In the past dozen months, a number of major companies have announced significant initiatives to embrace cleantech, including General Electric (ecomagination), BP Petroleum (making energy more...), and General Motors (live green go yellow). Many other companies—large, small, and nascent—are hard at work exploring and developing cleantech opportunities.

Driving interest in cleantech is an evolving national and international consensus regarding the potential risks of global warming, concerns about increased competition for scarce natural resources, interest in addressing markets “at the bottom of the pyramid,” and a growing realization that cleantech offers lucrative commercial opportunities. For example, when General Electric Chairman and CEO Jeffrey Immelt launched the GE ecomagination initiative in 2005, he noted that GE expects its cleantech-related products to grow to \$20 billion annually by 2010.

While large companies such as GE have been making headlines, it is valuable to speculate where tomorrow’s innovative new cleantech businesses and technologies will originate. A common opinion and perception is that large businesses will lead the charge into clean technologies and will dominate cleantech in the same way that they dominate their current markets. However, history suggests a different outcome.

Time and again, an examination of economic progress demonstrates that revolutionary “disruptive” innovation does not arise from large and well-established incumbents, but from small risk-taking companies and individual entrepreneurs. While large organizations (both private and government) are masters of incremental improvement and innovation (part of the reason they are large), they have repeatedly proven unable to rapidly embrace quick and radical changes in a technological landscape.

The evolution of personal computing and the Internet emphatically makes this point. The first hobbyist personal computer was offered for sale in 1975 by a small Albuquerque calculator manufacturer, Ed Roberts, not by INTEL. That firm developed the microprocessor used by Roberts (INTEL turned down a similar proposal

for a personal computer). The initial commercial successes of the personal computer were due to the entrepreneurial efforts of college dropouts (including, among others, Steve Wozniak and Steve Jobs, who founded Apple, and Bill Gates and Paul Allen, who founded Microsoft), not by obvious incumbents such as IBM, XEROX, HP, or Digital Equipment. The now-dominant manufacturer and distributor of personal computers, Dell Computer, was founded by a college student in his dorm room (Michael Dell). While the original Internet was developed from government-sponsored research in the 1960s and 70s, its commercial explosion occurred when individual innovators developed the World Wide Web file exchange architecture (Tim Berners-Lee of CERN) and the Internet browser (Mark Andreessen, founder of Netscape) in the early 1990s. The leading Internet search engine, Google, was started by two Stanford Ph.D. students (Larry Page and Sergey Brin) in the late 1990s, which quickly supplanted the then-dominant search engine incumbents, Lycos, AltaVista, and Northern Light. The history of the PC and Internet industries is the repeated success of small Davids overwhelming incumbent Goliaths with rapid innovation and disruptive change.


The lesson for cleantech is that innovation will come from improbable sources. While large established firms will surely contribute to the development and commercialization of cleantech ideas, radical innovation is not the province of large players. Instead, it will be unknown, unpredicted, and unlikely entrepreneurs who introduce the radical change that will transform cleantech in ways yet unforeseen. Just as few envisioned the possibility of personal computers in the early 1970s, or the explosion of the Internet in the early 1990s, it is impossible to forecast what cleantech innovations will transform the world in the years ahead. What can be said with certainty, however, is that entrepreneurs will be experimenting with new ideas and new technologies to create novel business opportunities in the cleantech space. Most of these experiments will be unsuccessful and soon be forgotten—such is the nature of discovery. But some will be wildly successful, and, in a decade or two, they will be heralded and recorded as the obvious evolution of cleantech innovation.

What can also be said with some certainty is where cleantech innovation will occur. History



tells us that creativity thrives where innovation is encouraged and admired, where there are socioeconomic incentives for inventiveness, and where diversity of opinion and ideas are tolerated and admired. This suggests that cleantech innovation will flourish in regions where entrepreneurship is prevalent and where new ideas are abundant. It is no accident that much of the commercial innovation of the last half-century has occurred in capitalist, entrepreneurial economies near major universities and research centers. In the United States, Boston and San Francisco immediately come to mind.

Many of us at CU believe that Colorado has this yeasty mix of ingredients to drive cleantech innovation. Colorado has a thriving entrepreneurial community enriched by a world-class university and important federal laboratories. Its people, by their nature and history, are risk takers and adventurers willing to explore and settle new territory. People and organizations continue to come to Colorado because of their interest in the environment and in the balance of opportunity and lifestyle that the state offers. So we predict that Colorado has the potential to become a center of cleantech discovery, innovation, and commercialization if the collective will of the Colorado people and its institutions embrace the opportunity.

Cleantech is being heralded as the “next Internet revolution” of the commercial world. If true, the revolution will again be led by small, nimble entrepreneurial radicals rather than large and entrenched incumbents. Exciting times lie ahead. 

Stephen Lawrence is an associate professor of operations management in the Leeds School of Business at CU-Boulder. He can be reached at Stephen.Lawrence@Colorado.EDU.

Sun and Wind: Cleantech Investing in Colorado

Peter Edwards

Altira Group LLC is a Denver-based investment company focused exclusively on energy and energy technologies. We only invest in private companies and are typically called either private equity investors or venture capitalists. Lately, we have acquired an additional cognomen, *cleantech investor*. What does this term mean, and what does it mean for Colorado?

Cleantech investing is born of the notion that citizens of the world can improve the quality of life on this

- The willingness of state and federal governments to offer financial and other incentives to sustainable and renewable energy

As shown in the accompanying matrix, cleantech investments may be thought of as falling into a matrix. Each investment can be classified into one or more types, and one or more energy sources.

Here are a few examples of companies that fall into the cleantech matrix:

- EnergyWindow, Boulder, CO—Arranges Internet-based auctions to enable commercial power consumers to obtain electric power at the best available prices
- Southwest Windpower, Flagstaff, AZ—The world's largest manufacturer of sub-5kW wind turbines
- Windlogics, Minneapolis, MN—A supercomputing facility with patented software that forecasts wind farm production for site evaluation and load management
- Galveston Bay Biodiesel, L.P., Galveston, TX—a 20-million gallon per year soy-feed stock, biodiesel production facility

All of these are successful companies, and they are all either located in Colorado or exemplify businesses that could be located here. Indeed, Colorado may be the leading contender for the title, "Renewable Energy Capital." Arguably, no other state can beat our combination of cleantech ingredients:

- A total of 310 days of sunshine a year for solar
- Among the best wind farm resources in the country in southeast Colorado, with new transmission facilities constructed or planned
- Agricultural communities eager to leverage their existing land-based resources, (e.g., for wind and renewable energy feed stocks)
- National Renewable Energy Lab in Golden
- Colorado Fuel Cell Center, Colorado School of Mines, in Golden
- The Federal Center in Englewood
- Convenient location for global business—Denver International Airport
- Highly educated and skilled population base
- Attractiveness to new talent—outdoor sports and recreation, environmental consciousness, quality of life

Colorado voters recently passed Amendment 37, which requires Colorado's largest utilities to provide increasing percentages of their retail electricity sales from renewable resources of all types. Colorado was the first

CLEANTECH INVESTMENT MATRIX

		RENEWABLE ENERGY SOURCES				
		Wind	Solar	Biomass	Clean Fuels ¹	Other ²
TYPES OF INVESTMENTS	Product (e.g., wind turbine)	●	●	●	●	●
	Service (e.g., solar installation, green building design)	●	●	●	●	●
	Project (e.g., biofueled generation facility)	●	●	●	●	●
	Information technology, including software	e.g., home energy management, load management, equipment monitoring and maintenance				
	Storage and transport	e.g., fuel cells, batteries, hydrogen compression, coal gasification				

¹ Any type of combustion may emit some carbon dioxide, which is generally thought to contribute to global warming. Certain fuels, however, are considered less polluting, and are sometimes called "clean" (e.g., ethanol, biodiesel, natural gas and clean coal). Ethanol and biodiesel have the added advantage of consuming carbon dioxide in the production of the raw materials, corn and soy.

² For example, hydroelectric, ocean waves and tides, geothermal.

planet through advancements in technology such as renewable energy and environmental remediation. On a more mercenary level, it stems from the notion that investors can reap profits from earth-friendly technologies. Cleantech investing refutes the idea that earth-saving improvements operate like a tax on our economy (i.e., they must come at the expense of business productivity). Cleantech investing relies for its recent success not on mere altruism but on a "perfect storm" of factors that have been brewing for years:

- A six-fold increase in the price of a barrel of oil
- Geopolitical unrest
- Breakdowns in our electric power infrastructure at a time of increasing demand
- Improvements in science and technology
- Increased public awareness of the dangers of irresponsible development and pollution
- Global warming concerns

Moving Clean Energy Technology to Market

L. M. Murphy

Background

Clean energy (CE) technologies are increasingly becoming of interest for a rapidly growing number of applications. This is due, in part, to their falling costs, and the increasing and highly volatile costs for conventional sources. In fact, CE is one of the fastest growing areas in the investment community. Interest is also high with a number of public sector energy investors (e.g., federal and state), because of the potential to create more businesses, economic development, and jobs, and, in the process, promote CE deployment, environmental enhancement, and improved energy security.

A continual stream of innovations is essential to maintain this level of investor interest. Just as important, lest these innovations lie fallow, they must transition out of the labs and into market-focused, investable businesses. Good support exists for R&D, and plenty of private sector money (e.g., venture capital) is available if the deal is right. Ironically, however, there is a relative dearth of resources available for transitioning technologies out of the lab to the point where they can attract private sector financing. This gap is sometimes called “the valley of death,” and technologies can be stranded here (Murphy and Edwards 2003). Solving this problem will enable public sector investors to enhance the productivity of their R&D investments in CE and generate an increased number of lower risk/higher quality opportunities for the private sector investment pipeline.

Private Sector Investor Context and Perspectives

Private sector financiers invest in market-focused businesses first and foremost, not in technology per se. As a prerequisite for investment, they require that companies demonstrate key risk-reducing characteristics that are strong indicators of potential market place success; otherwise they don't invest. For venture capitalists, the key ingredients for success include an exemplary management team, robust markets, clearly demonstrated superior technology, market-driven products, and good liquidity and returns for the investment. Venture capitalists, even those who deal with “early stage” financing, also want products in the market within two years. All of these ingredients must be successfully addressed by entrepreneurial companies.

For technologies emerging from labs and universities, the risk associated with the earliness of the technology and products (maturation is needed), as well as the lack of market validation for the technology and long times to markets, tend to make private sector investors, even sophisticated angels, uncomfortable. In addition, in

many cases, a market-focused company may not be formed yet, which is a top priority in getting financing for commercializing the technology.

While private investors often say the best ideas are the ones that make it through the valley of death, this is not always the case. For example, some good technical innovations will never be appropriate for venture capital, but may well be for strategic industry or other financing. Furthermore, some innovations that are conceived for one application but have a nonoptimal beachhead market may, in fact, be important platform technologies that can address a range of other more valuable markets.

EARLY STAGE TECHNOLOGY, PRODUCT MATURATION, AND MARKET VALIDATION CAN BE ADDRESSED BY BUILDING ON AND LEVERAGING THE EXPERTISE OF THE PRIVATE SECTOR EARLY IN THE COMMERCIALIZATION PROCESS.

Moreover, the quantity, quality, and technical certification value provided by the labs and universities can warrant a closer look at a wider range of emerging technology ventures.

What is Being Done Now

Resources from a number of valuable state and federal programs address some of the key stumbling blocks in this funding gap area. However, these programs are often only sporadically available, and the amounts available for investments are relatively small, especially considering the wide range of technologies they address. Public-private partnership models, such as the CIA's successful In-Q-Tel fund, also appear to be appropriate for CE.

Moreover, our early success with quality business incubators and the NREL Industry Growth Forums indicates that, given the right environment, the risk to investors can be reduced substantially. This would enable more CE technology ventures to reach their market potential or at least ensure that they are given an adequate opportunity.


Path Forward

Early stage technology, product maturation, and market validation—areas not well served by the current public or private sector—can be effectively addressed by building on and leveraging the expertise of the private sector early in the commercialization process. The private sector can identify technologies with good

STRANGE BEDFELLOWS, CONTINUED FROM PAGE 2

sectors, like software or biotech. The reputation of cleantech venture funds will suffer if venture portfolios show investments that contribute positively to environmental and social concerns but have lower returns than those generated by the venture industry as a whole.

We are far from having financial, environmental, and social needs pursued simultaneously and with equal priority in the business of technology. However, many innovative efforts within cleantech are seeking to maximize financial return by responding to increasing consumer pull for improving health, the environment, and/or social concerns. This trend bodes well for the health of consumers, the environment, and business, though much more needs to be done.


By building on pressure and increasingly collaborative support from environmental and social advocates, and strong and growing consumer demand for healthier choices, Colorado businesses can respond with cleantech solutions that bring positive results to the triple bottom line. 

Alex Sloan is a founding partner of Blackwolf Partners, a venture capital firm with offices in San Francisco and Chicago that invests in early stage cleantech opportunities. Alex recently participated as a judge in the Deming Center for Entrepreneurship's Sustainable Venturing Business Plan Competition, a student competition designed to address sustainable venturing. In addition, he advised and mentored student teams by providing invaluable feedback regarding cleantech ventures and investing.

SUN AND WIND, CONTINUED FROM PAGE 4

state in the union to have this type of requirement, often called a renewable portfolio standard, enacted by popular vote.

Amendment 37 and Colorado's resource and skill base are now converging at a unique time. With cleantech investing growing by leaps and bounds—now representing nearly 10% of all North American venture capital investment, according to Nick Parker, Chairman of Cleantech Capital Group—the perfect storm is gathering strength. Colorado is poised to take advantage of

the myriad challenges driving toward renewable energy development to become a cleantech powerhouse. 

Peter Edwards is a partner at Altira Group LLC, a venture capital firm focusing on energy technologies. He recently participated as a judge in the Deming Center for Entrepreneurship's Sustainable Venturing Business Plan Competition, a student competition designed to address sustainable venturing. In addition, Peter advised and mentored student teams by providing invaluable feedback regarding cleantech ventures and investing.


CLEAN ENERGY TECHNOLOGY, CONTINUED FROM PAGE 5

market potential and help align them more appropriately with the needs of anticipated investors. A successful public-private sector approach to technology commercialization will:

- Understand and use the full financial chain.

Employing an integrated approach that pays particular attention to the anticipated full spectrum of requirements from investors for the venture, in the pre-seed and seed stages, is particularly important;

- Engage the anticipated private sector partners to gain their often excellent innate sense of markets early on to get these entrepreneurial ventures on the most feasible financing and market trajectories; and finally
- Continue to explore and develop innovative public-private partnerships (for example, In-Q-Tel) that collaboratively buy down risk, and partner with strong

MBA entrepreneurial programs (e.g., at CU-Boulder's Leeds School of Business and other universities) to tap into their creativity for novel financing mechanisms, investment aggregation, unique deal structuring, and market characterization. 

Further Reading

Murphy, Lawrence, and Peter Edwards (May 2003). *Bridging the Valley of Death: Transitioning from Public to Private Sector Financing*. NREL/MP-720-34036. Golden, CO: National Renewable Energy Laboratory.

L. M. Murphy is the manager of the Enterprise Development Program at the National Renewable Energy Laboratory.

Cleantech, Sustainability, and Capital Investment: Interview with Chris Andersen

Alison Peters

Chris Andersen, an alumnus of the University of Colorado, is chairman of the board of directors of Millennium Cell, a hydrogen battery company. He is also a partner of G. C. Andersen Partners, LLC, a merchant-banking firm, and a director of TEREX Corporation, a manufacturer of mining, lifting, and construction equipment. Andersen comes from a long background in finance. He spent 15 years at Drexel Burnham Lambert and 5 years as vice chairman of Paine Webber.

You've said before that you're not a tree-hugger. What is it that draws you to an alternative energy business like Millennium Cell?

It's true, I'm not a tree-hugger; I'm a money-grubber. Millennium Cell, which makes hydrogen batteries, was very different from what I do normally. When we first looked at it, we weren't smart enough to know if it could work, but we knew that if it could, the world wanted it to happen. Millennium Cell has a process that, in effect, delivers hydrogen to a fuel cell with an energy density equivalent to that of gas to an internal combustion engine. We think the world would like to have another liquid fuel with the energy density of gasoline.

What's a major emerging opportunity in sustainability that you see on the horizon?

I'm part of a new initiative coming out of the Milken Institute called SAVE (Strategic Action Volunteer Effort). Our first project is called "Achieving Energy Independence." I was born in Detroit in a different era. The U.S. was the major world exporter of oil. You had utilities trying to get people to use electricity, so Detroit Edison had a program where they gave light bulbs away.

Today, 40% of the energy consumed in the U.S. is in the form of electricity, and half of that is for lighting that could use energy-efficient bulbs. If we cut lighting energy use in half, we'd cut total U.S. energy use by 10%. Well, I wonder if I could talk Detroit Edison into going back into the light bulb giveaway business.

The trick is to figure out how to go about doing something that you can actually implement and do it quickly—without bludgeoning utilities, but using capital markets to help them make a rate of return that makes it worthwhile.

How do you see markets for renewables changing over the long term?

Henry Ford's first auto ran on ethanol. It's because we have the convenience and energy density of gasoline that we have the transportation system we have today.

I think we'll go through iterations in our journey to renewable energy. For example, the U.S. is particularly blessed with coal. The problem with coal is that its energy in the wrong form for transportation—we want liquid fuel. It's also got emissions and other troublesome aspects. However, there are technologies to take coal and turn it into natural gas. Take it [to] the next step—gasify it, then turn it into a liquid. This technology has been around for 60-70 years. Today it doesn't cost more than world markets for liquid hydrocarbons. So it's time to look at coal differently.

What's your definition of sustainability?

Sustainability is the Holy Grail. But if you're too narrow in your definition of sustainability, you miss the opportunity to make progress toward the Holy Grail. Things like coal-to-liquids can lessen our dependence on fossil fuels, and can be produced at a single location where you can control the emissions to a vastly greater degree than you can in other processes.

I recognize that coal is not a reusable resource, but if you can do it in an environmentally conscientious way, it's a step on the road. How pure do you want to be? If you reduce overall energy use, you move toward energy independence.

What's happening in clean technology investment?

My feeling is that the wind has definitely shifted on alternative energy. Three years ago the wind was in your face; now it's at your back. There's an old saying on Wall Street: when the market wants to throw money at you, let it. For alternative energy, the market wants to throw some money.

What unique challenges do ventures in cleantech or sustainable products face?


They need to make sure that they've thought about economics and market realities as opposed to the emotional impact of what they're doing. You can actually drive capital away by sounding like you're doing this for altruistic reasons. Believe it or not, the market works.

The smart money also knows that government can't control the market for an extended period of time. Investors may come in and do something with a strong governmental incentive, but at the end of the day they have to be able to see how to make it work without subsidies.

How can Colorado cleantech companies attract more venture capital to the region?

Raise their profile. You have a couple of successes, you proclaim them loudly, and that's what raises your profile. Having public policy and government support helps, too—the governor of Montana was recently on *60 Minutes* talking about how excited the state would be to get a coal-to-liquids project going, and that's certainly a draw.

Location is a consideration but it isn't the major one. What's vastly more important is having the basic technology. For example, I'm very intrigued with a little company here in Colorado. They've developed a technology for a new window. A standard double-pane window has an R-factor, or insulation value, of 2. This company has a prototype that tested at an R-value of 8.5. In theory, it could go as high as an R-value of 11-plus. Now that's revolutionary.

Of course, clustering helps, too. Silicon Valley is such a cluster, and there's cross-fertilization, there's critical mass, there are entrepreneurs, and there are entrepreneurs who have made money and put it back into new companies—there's a cycle there. But they all started someplace. 

Alison Peters is the sustainable venturing coordinator at the Robert H. and Beverly A. Deming Center for Entrepreneurship at the Leeds School of Business at CU-Boulder.

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SUSTAINABILITY, CONTINUED FROM PAGE 1

Today's students—the business, science, political, and educational leaders of tomorrow—are ardently insisting that they receive the knowledge and skill sets to build and lead the sustainable and environmentally responsible organizations of tomorrow.

I won't attempt to offer the clear standard of what sustainability is. I would suggest, however, that in Colorado we understand it for what it can be—a huge arena of emerging economic opportunity.

- **The natural and organic foods industry**—a perfect example of sustainability. Innovative, pioneering, and exhilaratingly entrepreneurial, this global industry, founded on a premise of sustainability and modeling it in its practices, products, and innovative marketing strategies, grew up in Colorado.

- **Renewable energy.** This is one of the most rapidly emerging areas of innovation and entrepreneurial opportunity. Colorado is home to the Renewable and Sustainable Energy Initiative on the Boulder Campus of the University of Colorado. The National Renewable Energy Laboratory (NREL), located in Golden, is one of the premier such


laboratories in the world. Colorado boasts a wide selection of the renewable energy resources of promise, including wind power, solar power, and biofuel materials. Additionally, Colorado has one of the most vibrant entrepreneurial and venture capital communities and spirit in the world—all ingredients for innovation, invention, and new economic opportunities.

- **Cleantech innovation.** Related to renewable energy, which is a major sector of venture investing, cleantech is more expansive, covering a vast array of technology-based new venture development in biotech, nanotechnology, software, and other typically venture capital-backed start-up companies. These firms will lead the way in innovative new solutions to improve our efficient utilization of resources.

Sustainability holds the prospect of opportunity. Colorado's role can be strategically positioned at an international level but this will require the collaboration of many parties. Research in our universities and Colorado-based laboratories will lead the way. Higher education in all forms—research universities, teaching colleges, and two-year junior colleges—will train

the youth of Colorado and help them to acquire the knowledge skills they will need to find jobs and build careers in the emerging growth companies that will spring from Colorado's entrepreneurial business and financial community.

The challenge for Colorado—and global—companies is to make the transition in their thinking from a risk- and compliance-based approach to an opportunity-based approach.

To borrow a quote from *The Economist*: “For far-sighted companies, the environment may turn out to be the biggest opportunity for enterprise and invention the industrial world has ever seen.” By identifying market gaps and entrepreneurial niches that are yet unfilled, and matching those to a company's unique skills and resources, businesses may well find that the challenges of sustainability can become sources of opportunity and competitive strategic advantage in the future. 

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