By Melanie D.G. Kaplan

Going Clean

Alumni and students explore the emerging industry of cleantech.

David Leeds (BSBA ’99) had worked in real estate finance and was living abroad. Marty Griffith (MBA ’11) was running a catering business. Brenda Quiroz Maday (IEMBA ’05) was a business counselor. >>

ANDREW KIST

David Leeds (BSBA ’99), shown in Times Square in New York City, focuses on the “smart grid” that ties clean technology together.

Intel for the Cleantech Set

In the time it takes to charge your electric vehicle, you could miss some cleantech news — that's how quickly the business and the technology are changing. How to keep up? "You have to follow blogs," says Marty Griffith (MBA '11). "If you're following a couple good blogs and going to conferences, you have a chance of staying current."

Thanks to students and alumni working in the field, here is a recommended reading list (in alphabetical order):

1. Clean Techies: cleantechies.com
2. earth2tech: earth2tech.com
3. Energy Central: energycentral.com
4. GreenBiz: greenbiz.com
5. GreenTechMedia: greentechmedia.com
6. *The New York Times*' Green blog: green.blogs.nytimes.com
7. Plug In America: pluginamerica.org
8. PV-Tech: pv-tech.org
9. RedHerring's cleantech coverage: redherring.com
10. RenewableEnergyWorld: renewableenergyworld.com/rea/blog
11. Seeking Alpha: seekingalpha.com/tag/alternative-energy
12. SmartGridNews: smartgridnews.com
13. SmartPlanet's Intelligent Energy blog: smartplanet.com
14. *Technology Review*'s energy coverage: technologyreview.com/energy

While their careers varied, for these three Georgetown University McDonough School of Business students and graduates, passion drove them back to school and into the business of clean technology. For years, each has cared deeply for the environment or, at the very least, understood that we live on a planet with limited resources.

There came a point, however, at which enthusiasm was not enough; they wanted to get down to business.

For Quiroz Maday, who founded BDMllc in Alexandria, Va., to provide environmental and energy consulting, the cue came when she realized many environmental problems — and their solutions — had something to do with chemistry. She first studied chemical engineering and then business. "I understood that in order to effectively implement long-lasting technical solutions," she says, "you need to effectively manage your resources."

Leeds, who spent several years living abroad after working in real estate, considered which global problems he could help solve, and he chose energy. "It seemed to be the right time," he says, "and I came to believe it was going to be critically important."

Griffith, who interned this summer at a natural gas company, notes, "I'm seeing a paradigm shift where [cleantech] is moving in the direction of harnessing the power of business in a way that it didn't before."

This shift — and the commitment from government and corporations to support a new way of doing business — has been a call to action for those who care about our world and understand caring only goes so far. Quiroz Maday, Leeds, Griffith, and their peers heeded the call and acquired the business tools they knew they would need in what is being called the next industrial revolution. There is no question about clean technology, they say: The time is now.

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> — David Leeds (BSBA '99)

Smarter, Cleaner, Greener

Clean technology, commonly called cleantech, greentech, or even envirotech, represents the convergence of information technology, green transportation, and renewable energy (such as wind, solar or hydropower, biomass, and biofuels).

"The big picture is that we're trying to get off oil and coal," says Leeds, an analyst for New York-based Greentech Media, Inc., who writes and speaks about the smart grid and last year wrote *The Smart Grid in 2010*, which he says has been downloaded more than 10,000 times. The smart grid — a broad and somewhat elusive concept — is what holds all the cleantech pieces together. The idea is that it will deliver power to customers more efficiently, with the ability to digitally monitor and control energy usage, while also facilitating the integration of renewable energy.

Many of the technologies playing key roles in the cleantech revolution have been around for decades, but evaluating, scaling, and deploying them for a mass market is one of today's challenges. Keeping up with constant changes is another hurdle (see sidebar, "Intel for the Cleantech Set"). And while Leeds says the performance and growth of certain clean technologies seems to reflect Moore's Law, becoming twice as powerful every two years, regulatory challenges remain, and keeping the U.S. in the race is not easy when research and development budgets here pale in comparison with those in some other countries.

But mystifying and muddled as it may seem to a cleantech novice, the sector is poised to take on the world. According to Leeds, the $4.5 billion in federal stimulus funding dedicated to smart grid efforts will enable 18 million smart meters, which allow two-way communication between the end users and the utility company, to be installed over the next five years. Installations of global solar energy have jumped from 170 megawatts in 2000 to 10 gigawatts today — an astronomical leap. So there is little question that cleantech will continue its growth over the next few decades. What is still up in the air is which countries and providers will make it happen the fastest.

"There's this big race going on," Leeds says. "In my eyes, it's a green arms race between the U.S. and China." He says the holy grail of the race is energy storage. "Whoever can figure out how to capture energy and redeploy it into the grid when you need it will come out on top."

The Other Green

Capturing energy is impressive, but in this climate, capturing capital is the real coup. Public and private investment in cleantech is soaring, but it is tricky for startups to hack through the varying subsidies offered in each state and to stand out among all the other startups fighting for venture capital (VC).

"Venture capital and private equity are hovering around this space," says Brian Perusse (MBA '09), who works for Arlington, Va.-based AES Corporation, managing large-scale energy-storage projects from conception through operation. While at Georgetown, he interned for the company and worked for them as an external consultant before being hired after graduation.

Two major IPOs, Perusse says, have created a lot of buzz: Tesla Motors in June (raising $226 million) and A123 Systems, the lithium ion battery supplier partly owned by AES, last September (raising $380 million).

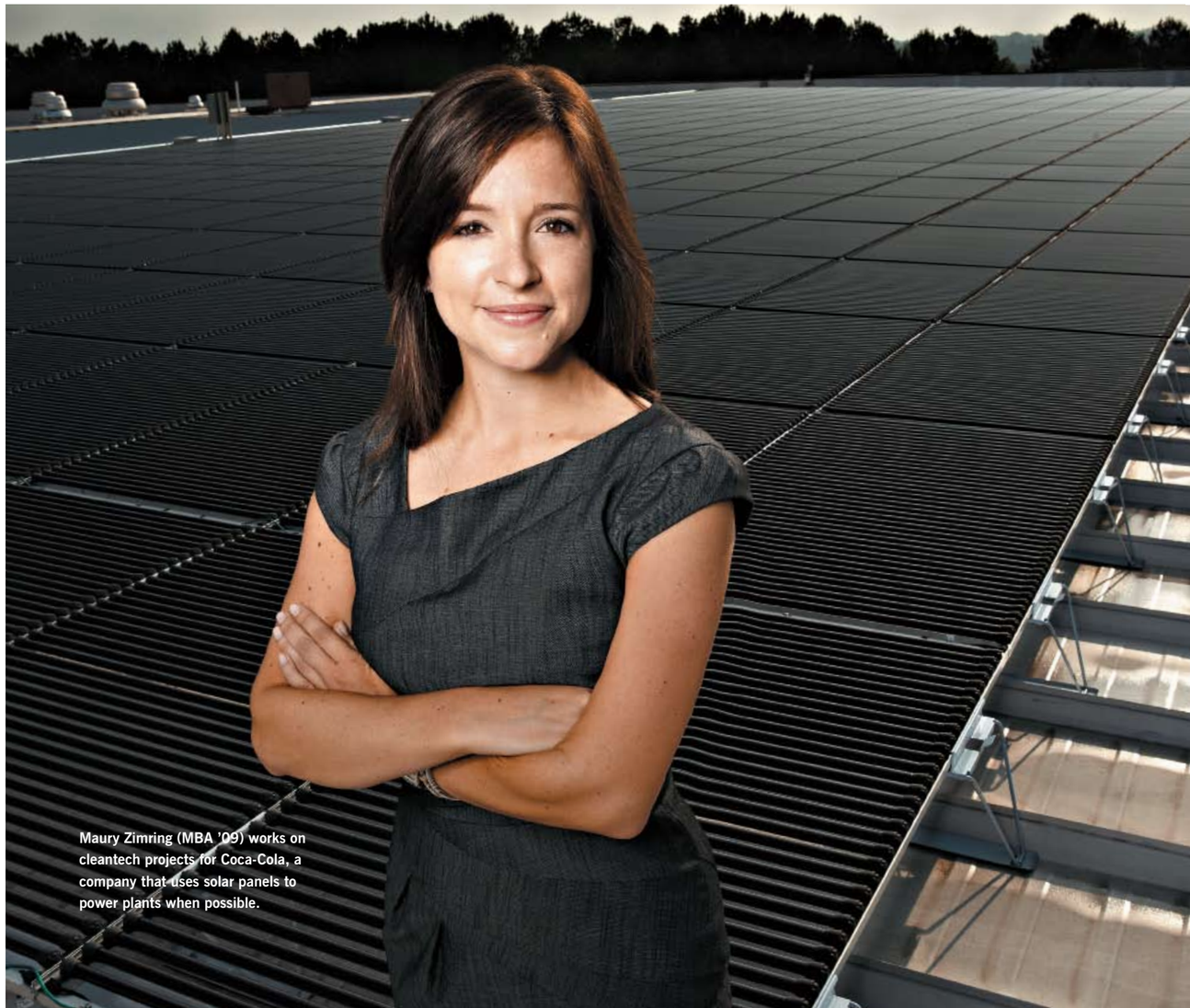
"The biggest hurdle for VC is the amount of capital required to scale a business," says Perusse. "Some will require hundreds of millions to scale up to a point where they are profitable, and VC doesn't usually have the appetite for that. The IPOs help validate [that] there's a potential exit strategy for VC and private equity."

Many experts in this sector like to say that in the VC arena, cleantech is the new dot-com. Some firms, such as Kleiner Perkins, have transitioned in a big way from the Internet to cleantech, which is encouraging for U.S. companies that may not have the government support that their counterparts have in countries like China or Germany.

But Perusse argues that supporting cleantech is riskier than funding Internet companies. "The Internet was a new platform and could be developed from scratch," he says. "Cleantech is operating in an existing space — the energy sector. And that comes with existing, entrenched incumbents, which can make it more complicated when you're trying to get rules changed to incorporate a new technology."

Randy Roy (IEMBA '00), who founded Severna Park, Md.-based Lars Energy, LLC, in 2001, shortly after he graduated, says federal and state subsidies help promote technologies that would otherwise be cost-prohibitive, such as biodiesel and solar projects.

"I like to call it the gap between economic returns and environmental returns," says Roy. His business, which develops green projects and looks at a wide assortment of technologies, says understanding the state and regional incentive structure allows him to focus on those technologies that support



QUANTRELL COLBERT

Maury Zimring (MBA '09) works on cleantech projects for Coca-Cola, a company that uses solar panels to power plants when possible.

McDonough School of Business students Nick Chaset (MBA '11) and Rusmir Musić (MBA '11) are active in clean technology clubs, projects, and summits on campus.

WELTON DOBY III

a local bias. For instance, Lars helps companies participate in demand-response programs that manage customer consumption of electricity. States that are worried about an electricity shortage support such programs, but others do not. So if Roy is working with a company that has operations in multiple states, he researches which state will yield the best economic returns.

Andrey Shlyakhtenko (MBA '10), who co-founded Rosslyn, Va.-based Sol-R Energy last December while he was a student, says the investment climate in the U.S. is starkly different from that in France, where his company assembles panels in solar power plants.

"In France, once the system is built and commissioned, the government signs a contract to agree to buy everything at a fixed and very favorable rate for 20 years," he says. "In the U.S. there are subsidies, but short-term, so the level of risk is much higher."

Shlyakhtenko, who earned a Ph.D. in physics in Russia before coming to Georgetown, is approaching potential American and European investors. He says raising capital is a tremendous challenge due to the current economy and the perception of cleantech as a high-risk venture.

The capital outlook is vastly different on the corporate side, where federal and state grants are important drivers of clean technology. Coca-Cola Enterprises (CCE), for example, will receive more than $9 million in grants to double the size of its hybrid electric vehicle fleet in 2010, says Maury Zimring (MBA '09), manager of corporate responsibility and sustainability for CCE in Atlanta.

"You see a ripple effect," says Zimring, whose job it is to figure out, through pilot programs, which capital projects help the company reduce its energy and water use and increase recycling. "Despite the economic situation we're all in, the more businesses get involved, the more investment there is, and the more small companies grow." She says by piloting fully electric trucks partially funded by federal stimulus money, CCE helped to enable Smith Electric Vehicles — which previously manufactured only overseas — to build a facility in Kansas City, Mo.

Zimring says although the push toward clean technology comes from corporate leadership combined with stimulus funds and nonprofit organizations, there also is a growing trend toward investors making cleantech a priority. "The Dow Jones Sustainability Index looks at everything from water and energy usage to the number of miles our trucks drive and how much money we invest in reducing these issues," she says. "[The Index] comes to us every year, and you have to show progress. Investors are paying attention to that."

Students Put Georgetown on the Cleantech Map

Increasingly, business school students are paying attention, as well. Two years ago, some Georgetown McDonough School of Business students founded the Energy Club. Last fall, finding that the club did not focus enough on renewable energy, Nick Chaset (MBA '11), then in his first year, founded the Cleantech Club.

"I thought it would be a good way to meet classmates who were interested in the topic and to network with potential employers," says Chaset. He arrived at Georgetown with five years of experience working in renewable energy at an international energy consulting firm, a solar developer, and the California Public Utilities Commission, where he worked on the California Solar Initiative. Chaset used the UC Berkeley Haas School of Business' cleantech club as a model for the McDonough School of Business' club and says it will be an important part of building Georgetown's brand.

The university has already taken a lead in its facilities with the new Rafik B. Hariri Building, which houses the Georgetown McDonough School of Business, and which was recently awarded LEED Silver Certification from the U.S. Green Building Council. Thanks to its innovative design features, the building is expected to save 15 percent in energy costs and 41 percent in water use.

"Renewable energy and cleantech is still very much an emerging sector of the economy," Chaset says. "Georgetown, in a city where so many critical decisions are made in the cleantech sector, has a unique opportunity to take a leadership position."

The club, which has since merged with the Energy Club, hosts monthly events that educate the Georgetown community, including campus presentations on wind and solar energy. Last year, the club partnered with Carbon War Room, an initiative by Sir Richard Branson that — partly as a result of the Cleantech Club's efforts — held its Creating Climate Wealth summit at Georgetown last fall. Club members also have completed mini-consulting projects with Azure Power and Washington Metropolitan Area Transit Authority, and helped the American Council on Renewable Energy run a social media and marketing campaign for its 2009 conference. In the spring, the club helped host Green to Gold: Growing the Clean Energy Economy, with a keynote speech by James Woolsey, former director of the CIA and a partner at Vantage Point Venture Partners.

At all these events, Chaset says, students have the opportunity to network, and the club has developed career opportunities for members. Out of 25 active members, about one-third worked in cleantech internships this summer. Chaset is one of them. He works as government affairs manager for Oakland, Calif.-based Renewable Funding (a job he holds part-time during the school year), where he oversees development of regulatory and public policy strategy

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Be the Next Mr. (or Ms.) Clean

The good news for cleantech job-seekers is that there are significantly more career paths today than there were even three or four years ago, when many in the field were engineers building the technology or were working at advocacy organizations.

"We're talking about launching a whole new industry," Leeds says. "You're going to need everything from financial analysts who help invest in these young greentech companies on the venture capital and investment banking side to programmers, engineers, and sales and marketing folks at the utilities. You have the utility companies that have never had to market to the customer before — they just send the bill and get paid — now seeing their entire business reinvented."

But alumni warn that it is not an industry for novices. "There's a lot of growth in this industry, and people think they can just jump into it," Perusse says. "It takes some understanding of engineering, the regulatory environment, and technology."

Zimring, who managed retail LEED certifications at the U.S. Green Building Council before earning her MBA, agrees that having the right background is key, particularly in this industry, because of the complex technical side. She says people tend to have either the financial and marketing skills or the background in environmental conservation, but it is important to enter this industry with all of it. "I don't think I would have this job if I hadn't done both," she says.

The EDF Climate Corps is a partnership between the Environmental Defense Fund and Net Impact, a national organization of graduate students and alumni that focuses on using business skills to improve society. The group matches business school students with companies seeking energy efficiency plans. This is how Griffith ended up spending his summer at New Jersey Resources, exploring the company's facilities and suggesting ways it could undertake efficiency investments that would both be profitable and reduce its carbon footprint. He says he learned a lot about how utilities are regulated and how the companies are changing their models to profit from encouraging reduced energy usage.

He also learned that energy companies are a good place for alumni to find work and the types of salaries they seek. "If you want to bring new technology to society on a massive scale, the utilities are a good way to go," he says.

Griffith, who is still nourishing his entrepreneurial spirit with the occasional catering gig, says at first, he will likely work for a startup. He enjoys the fresh thinking involved, and he does not think he has enough experience to work at a traditional energy company right away. He compares the cleantech startup landscape to that of dot-coms, noting that few of the existing startups are currently profitable, and few will succeed.

But he says those that do survive could end up being the next Googles. So for Griffith and others who seek a chance to work in a burgeoning industry — and do some good for the planet along the way — the rewards may be worth the risks.

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