

THE NEWSLETTER OF THE BDO TECHNOLOGY &amp; LIFE SCIENCES PRACTICE

# BDO TECH



## THE CURRENT STATE OF CLEANTECH

By Tim Clackett

In January 2014, CBS's *60 Minutes* ran a segment focusing on the state of the cleantech space. The piece was largely critical of the sector, claiming that cleantech has absorbed a significant amount of federal and state grants and credits and remains risky. Success has been sporadic and venture capital investment has declined. The program highlighted well-known corporate failures, including Solyndra, Fisker and LG Chem, and portrayed those who remain committed to cleantech as pioneers with unrealistic ambitions. Yet, how valid are these criticisms?

While it is true that the federal government did lose some money in its cleantech investments, these losses represent only 3 percent of aggregate investments. Many clean energy ventures have successfully launched with the aid of governmental assistance and

a significant majority of those loans have been paid back. The Department of Energy (DOE) has helped companies like Ford, which received a \$5.9 billion loan in 2009, and Tesla, which repaid the DOE its \$465 million loan early, to build more energy-efficient models.

Recently, the cleantech sector has seen significant growth and robust activity. Fiscal year 2013 saw 14 cleantech initial public offerings (IPOs) in U.S. public markets, and the sector performed extremely well last year: the Clean Edge Green Energy Index (CELS) rose by a record 89 percent. Goldman Sachs also teamed up with Solar City and invested \$500 million in a financing deal, announcing a \$40 billion investment in cleantech over the next 10 years. In early 2014 Google acquired Nest, maker and seller of efficient domestic thermostats that can reduce energy

### ▶ DID YOU KNOW...

According to *Clean Technica*, six solar power research and development projects in the U.S. will receive \$10 million from the U.S. Department of Energy to advance the technology.

The number of global wind installations has increased about 25 percent per year since 2006, consulting firm *McKinsey* reports.

According to the *2014 BDO IPO Halftime Report*, 71 percent of investment bankers surveyed predict an increase in IPOs from the technology sector during the second half of 2014.

Venture capital firms in the U.S. invested only \$2.74 billion into cleantech startups in 2013, the lowest amount over a six-year period since 2008, which saw a high of \$6.02 billion, according to *Dow Jones VentureSource*.

On June 2, the Environmental Protection Agency proposed a plan to cut carbon dioxide emissions emitted by power plants 30 percent by 2030, reports *USA Today*.

According to BDO's inaugural *Global TECHtalk report*, there were 211 total technology M&A deals globally in Q1.

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consumption, for over \$3 billion. There has also been an explosion of sharing-economy startups, where consumers share and reuse products and services, with the most famous ones being Uber, Lyft and Airbnb. Additionally, the global solar industry saw a record year in 2013 and, for the first time, more photovoltaic solar was deployed than wind power, according to Clean Edge.

Federal and state governments not only contribute to the sector's growth through direct grants and tax policy, but also by outlining specific fundraising targets that companies must achieve by a certain date. A good example is the AB2514 mandate in California, signed by Governor Arnold Schwarzenegger in 2010, which requires utilities to invest in electricity storage solutions to better balance grid supply and demand. Companies like Ice Energy Holdings have swiftly moved into this space by, in this case, developing rooftop units which effectively provide energy storage by supplying cooling to air conditioners.

In addition to its economic benefits, cleantech also allows people to use natural resources in a more productive and sustainable manner. In other words, cleantech is a necessary ingredient to produce environmental benefits for the U.S. and the world. Although renewable sources of power do not make up a majority of electricity generation in the U.S., renewables are growing and coal is declining. In 2012, the solar industry employed 119,000 whereas the coal industry only employed 89,800. This shows that the U.S. is shifting more and more to renewable energy and that the solar industry is undoubtedly growing.

However, clean energy presents a mixed picture. Nuclear sources of power generation, which do not generate the same levels of carbon dioxide or consume fossil fuels, can have a positive environmental impact. Still, many countries are hesitant to continue with nuclear energy. Japan does not plan to restart any of its nuclear plants following the explosion at its Fukushima plant in 2011, and Germany has started to move back to coal as the government plans to shut down all nuclear power plants by 2022. Alternatively, the U.S. is continuing its nuclear power investments with the DOE recently approving a \$6.5 billion loan guarantee to a Georgia nuclear facility,

## Perspective in CleanTech

In recent years, investment in the cleantech sector has waned. A range of factors may be to blame, including diminishing political incentives, a boom in U.S. natural resources energy production and challenges facing venture capitalists (VCs) when exiting cleantech investments. Looking at global VC investment in the industry, 2013 saw a total investment of \$6.8 billion, which is 15 percent less than the 2012 total, according to research firm the Cleantech Group. However, the tide may be turning. As 2013 progressed, VC investment in cleantech increased, delivering a compounded quarterly growth rate of 14.5 percent, according to *BusinessGreen*. In Q1 2014, investment in clean energy worldwide was nearly 10 percent greater than in Q1 2013, according to *Bloomberg New Energy Finance*.

Within the cleantech industry, a couple of sectors are fueling this increase in global investment: energy efficiency, which completed 188 deals and raised \$1.3 billion of venture investment in 2013; and transport, which saw a 20 percent increase in VC investment year over year, driven by web- and smartphone-enabled technology companies including Uber, eHi Car Service, DiDi Taxi and Lyft, according to the Cleantech Group.

While global investment activity is on the rise, the domestic picture is not quite as bright. U.S. VC investment in cleantech startups reached only \$2.74 billion in 2013, lower than 2012's \$3.39 billion and substantially less than 2008's peak of \$6.02 billion, according to data from *VentureSource*. Still, other private investors in the U.S. are feeding a new wave of cleantech investment, in particular, family offices, according to *The Wall Street Journal*.

*PEerspective in Cleantech is a feature examining the role of private equity in the Cleantech industry.*

the highest guarantee provided by the DOE to date.

Although U.S. venture capital investment in cleantech declined in 2013, we expect to see continued growth in the next decade in both clean energy and cleantech. With the Obama administration's recent proposal to reduce carbon dioxide emissions by 30 percent from 2005 levels no later than 2030, significant growth and investment opportunities lie ahead for the cleantech sector.

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# ICE ENERGY: A COOL ALTERNATIVE TO THERMAL ENERGY STORAGE

## Q&A with Philip Perkins, CFO of Ice Energy

In this issue of the *BDO Tech* newsletter, we take a close look at one of the most cost-effective and reliable energy storage solutions for the energy grid – thermal energy storage. Philip Perkins, CFO of Ice Energy, offers his take on how Ice Energy fits into the overall energy landscape and how the company is impacting the electric power grid.

Since 2003, Ice Energy has provided utilities with more than 20 million operating hours of reliable, cost-effective and green distributed energy storage capacity.

### **BDO:** *Can you tell us what Ice Energy does?*

**Philip:** Ice Energy invented and sells thermal energy storage units called "Ice Bears," which are devices that use ice during hot days to augment air conditioning operations. We hold patents covering distributed thermal energy storage systems that make our technology energy efficient and commercially viable. We have worked to convince utilities to establish energy storage units serving their grid. In addition, we serve as a project developer, coordinating the installation of the thermal storage devices.

### **BDO:** *How does it work?*

**Philip:** The Ice Bear is a box that consists of an AC compressor and a 500 gallon tank of water infused with coils. At night (during off-peak hours), the Ice Bear's compressor freezes the water. During the day, when the AC turns on, it cycles the coolant through the ice to efficiently cool a building. So for about six hours (during peak hours) the Ice Bear's AC compressor is turned off, and the device is using energy stored from the night before to cool the air. An Ice Energy storage project shifts electrical load from peak congested hours to nighttime. The cleverness of Ice Energy is that we can manufacture Ice Bears by the thousands. When a utility buys our products, it gets a solution to its peak power problems. It's like convincing four out of 10 cars on the freeway to stay home during rush hour.

### **BDO:** *Who are your customers?*

**Philip:** Our main customers are electrical power utilities who benefit massively from cutting down on peak power demand. Utilities acquire these assets two ways. They can simply purchase them outright, or they can purchase the storage capacity from a developer or third party – and pay for the assets over time – analogous to a power purchase agreement. There are opportunities for retail consumers to also acquire thermal energy units, and we expect this market to grow.

### **BDO:** *Why is storage such an issue in 2014 and beyond?*

**Philip:** Electricity is the only major traded commodity in the world that has no ability to store its production. Unlike gas or oil, electricity is consumed within milliseconds of its generation.

Without storage, electric utility grids have evolved into complex and inefficient animals. Electric grids must always provide the proper amount of electricity despite varying demand, and they must be built to handle peak demand (typically summer afternoons when air conditioners are used the most). As a result, if the proper amount of electricity cannot be provided at the time when consumers need it, the power quality will deteriorate, causing service interruptions or blackouts.

The second reason why energy storage is becoming more and more critical is because a number of U.S. states are now mandating renewable energy standards that require electric utilities to sell more power generated by wind and solar to decrease our carbon

footprint. However, such renewable energy sources pose a storage problem similar to electricity. For one thing, solar and wind energy sources generate energy on an intermittent basis (i.e., solar power is only generated when there is sun). Furthermore, wind farms and solar panels are usually located far from the locations where their energy is consumed. While renewable energy seems like the economically and environmentally smart approach, unless you can store it, you must have other energy means available.

### **BDO:** *What opportunities are you currently seeing in the energy storage space?*

**Philip:** Years ago, states and regulatory authorities decided that government oversight and incentives were needed to persuade utilities to add renewable energy to the grid. These incentives also encouraged companies to innovate and, ultimately, the incentives worked. The price of the technology decreased and an increasing percentage of our nation's energy is coming from renewables.

A similar scenario is happening in the energy storage space. In the fall of 2013, California issued the nation's first energy storage mandate, requiring three investor-owned utilities to acquire 1.3 gigawatts of storage and have it in place by 2020. California's lead will likely be followed by other states.

### **BDO:** *What sort of growth trend is Ice Energy anticipating for the next couple of years and do you face any challenges as a result?*

**Philip:** When our company began in 2003, most conversations with prospective clients were around whether or not they needed storage. However, a couple of years ago, that conversation shifted. Utility executives began to acknowledge the need for storage and their questions now focus on: 1) why this kind of

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storage? 2) how much energy can you store? and 3) when can you get started?

Today, we feel like we are on the edge of parabolic growth. The mandates signed in California are likely to drive enormous amounts of sale activity over the next couple of years. Our challenge will be handling this exponential growth.

**BDO:** *Can grid storage solutions keep pace with the growing use of renewables?*

**Philip:** We have to. As utilities bring more and more renewable generation online they must have storage solutions in place or they will run into a wall with renewables, risking service disruptions and blackouts.

**BDO:** *Where do you see the overall cleantech industry headed in the next six months?*

**Philip:** Energy storage mandates, rapidly ramping up in California, will be followed by similar initiatives in other states. Winning business in the RFPs spun out of these mandates will focus attention on storage technologies, which will further encourage efforts in storage technology, financing and economics. And that will have worldwide implications.

*Philip Perkins currently serves as Chief Financial Officer at Ice Energy. He can be reached at pperkins@ice-energy.com*

# BRIGHT SPOTS IN CLEANTECH

By Tim Clackett



**W**hile cleantech investments declined in 2013, the future remains bright. Investment in clean energy is already on the upswing in the first quarter of 2014, increasing 9 percent over the same period last year, according to *Bloomberg New Energy Finance*.

Three key factors are contributing to industry growth: renewable energy developments, an emphasis on sustainability and efficiency programs for buildings and vehicles, and the rising demand for water and food innovations.

## ▶SOLAR AND WIND POWER GROWTH

Significant advances in solar power, combined with incentives and cheaper prices for solar panels, are working in tandem to generate greater consumer and investor interest.

The U.S. solar industry enjoyed a record year in 2013, reporting a 41 percent increase in deployment over installation levels in 2012, the second largest source of new electricity generating capacity behind natural gas, according to the Solar Energy Industries Association. Global interest in solar is hot as well. The U.S., China and Japan are now

the world's three largest markets for solar photovoltaic installations in terms of new gigawatt (GW) capacity. China installed 12GW of solar capacity in 2013, nearly triple the 4.5GW deployed the year before, making it the most GW of solar power any country has ever added in a single year.

Solar costs are expected to continue to drop for consumers, which will further boost demand, thanks to a new class of solar cells that form less expensive roof panels. The new development blends tin with perovskite, an approach that uses cheaper materials than many of today's generation of solar cells and carries far less environmental and regulatory restrictions.

Investors see a promising future for the sector. In June 2014, Warren Buffett committed to doubling Berkshire Hathaway's \$15 billion investment in building wind and solar power installations in the U.S. A recent McKinsey article points to a steady increase in installed capacity for both wind and solar since 2006, with wind experiencing an average annual increase of 25 percent during that time and solar increasing 57 percent per year. This suggests that the cleantech sector is just emerging from a disillusionment

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or consolidation phase, and that future renewable developments are pivotal in dealing with global resource constraints and a growing middle class around the world.

### ►PRESSURES ON SUSTAINABILITY AND ENERGY EFFICIENCY

Sustainability and energy efficiency programs are increasingly being embraced by automotive manufacturers, corporations and the real estate sector.

Pressure is mounting on companies to be more socially and environmentally responsible, driving major corporations to pledge investments in renewable energy. Google recently announced its goal of becoming 100 percent powered by renewable energy and, earlier this year, switched on its solar investment that will produce 392 megawatts of electricity, making it the world's largest solar thermal project. To date, Google has invested more than \$1 billion in 15 projects that have the capacity to produce two GW of power around the world.

As companies examine ways to enhance the sustainability of their operations, new partnerships and products are emerging. For example, Flux, a startup, which recently launched from the labs of Google X, has developed a software product that takes into account the requirements of new buildings and other data points to create algorithms that enable buildings to be constructed with more sophistication and consume less energy.

Other companies, such as Nest Labs, are coming to market with energy efficiency products for both homes and buildings. Nest Labs offers a technology that "learns" the behaviors of a homeowner, automatically adjusting room temperature to save energy and reduce costs.

Energy efficiency is improving in the automotive industry as well. A new study by the International Council on Clean Transportation (ICCT) reported that global sales of electric vehicles doubled last year to around 200,000 units, having also doubled the year before. In the U.K., the government recently promised to spend £500 million over



the next five years to encourage the use of electric and other green cars.

### ►DEEPENING WATER AND FOOD SCARCITY DEMANDS ACTION

While efforts are progressing toward a more energy efficient, renewable resource-friendly future, it's the basic necessities of life – food and water – that may serve as the most critical call for investment and innovation.

According to the United Nations (U.N.), around 1.2 billion people, or almost one-fifth of the world's population, live in areas of physical water scarcity, and 500 million people are approaching this situation. The U.N. estimates that by 2025, 1.8 billion people will live in countries or regions with absolute water scarcity, and two-thirds of the world's population could live under water-stressed conditions.

In the U.S., recent drought conditions in California and the Southwest put a spotlight on the water scarcity challenge, which has led scientists to examine technology improvements and innovations in water delivery. As water availability grows more problematic, it only makes sense that agriculture follow suit.

Agricultural yield is diminishing across the globe, necessitating more productive solutions for farming, food crops and cultivation

of farmlands. The Food and Agriculture Organization of the U.N. estimates that the yearly investment in agriculture needs to rise by more than 50 percent globally to close the gap between what low and middle income countries have invested over the last decade, and what is needed by 2050.

Cleantech investors are starting to answer the cry for help, with water-related technologies securing \$190 million in venture investment last year and cleantech agriculture pulling in \$266 million.

### ►INVESTING IN OUR FUTURE

The road ahead for the cleantech industry is abundant with new opportunities that are addressing problems of global concern. A new book titled *Resource Revolution*, by Stefan Heck of Stanford University and Matt Rogers of McKinsey, argues that the world is on the cusp of a resource revolution with technology advancements improving productivity and the use of resources. Ultimately, industry professionals forecast growth as the cleantech sector continues to mature, demand for clean energy grows and more countries develop clean and green programs.

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## MARK YOUR CALENDAR...

The following is a list of upcoming conferences and seminars from the leading technology associations and business bureaus:

### JULY 2014

July 30 – 31

**ICRET 2014: International Conference on Renewable Energy Technology**

Engimatt Hotel  
Zurich, Switzerland

### AUGUST 2014

August 11-13

**International Conference on Smart Energy Grid Engineering**

University of Ontario Institute of Technology  
Oshawa, Canada

August 17-21

**SPIE Solar Energy + Technology Conference**

San Diego Convention Center  
San Diego, Calif.

### SEPTEMBER 2014

September 22-26

**29th European PV Solar Energy Conference and Exhibition**

RAI Convention & Exhibition Centre  
Netherlands, Amsterdam

September 23-25

**2014 Extension Energy and Environment Summit**

Iowa State University  
Ames, Iowa

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