

Innovations in Clean Tech Finance

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Creative Project Finance Boosts Distributed Generation

By Katie Gilbert

The clean tech industry is growing up. The most obvious sign? It can finally qualify for a loan.

Experts say that the project finance innovations being developed now for the clean tech sector will likely have a big impact in coming years, drastically lowering the cost of capital for solar projects, energy efficiency retrofits, and other clean technology.

“We’re now in a decade of financial innovation,” says Michael Eckhart, global head of environmental finance at Citigroup. “The development of financing methodologies very much has an effect.”

The current era of financial innovation didn’t happen overnight. Eckhart says that government incentives like European feed-in tariffs, tax credits, and renewable portfolio standards in the U.S. dating back to the 1970s have now moved the industry into its capstone phase.

“This is the final play in a 40-year emergence of the renewable energy industries,” he says. “After all this technology innovation, market innovation, policy innovation—it’s now reached the top of the stack, with capital market innovation.”

These financial market innovations in clean tech have direct implications for venture capitalists, pointed out Skip Grow, a managing director at Morgan Stanley, at February’s Cleantech Innovation Summit.

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“We’re now in a decade of financial innovation,” says Michael Eckhart, global head of environmental finance at Citigroup.

“There have been a number of favorable developments in the financial markets—a number of new instruments, like yield cos and securitization, have found their way into the renewables sector,” he said. “This brings new types of investors and new dollars, all of which is helpful to allowing the venture companies to get funded and to grow.”

The cleantech industry has come up against real challenges in figuring out how to attract basic financing from capital markets, owing to a couple of major challenges: since cleantech projects are usually relatively small, individual financings can be inefficient and expensive; and historical performance data hasn’t been around long enough to comfort investors and help them determine risk profiles. Many actors within the cleantech space have had to get creative about how to attract capital at affordable rates by finding workarounds to these obstacles.

“It’s taken time to get the clean tech industry thinking about redesigning and recasting itself so that it qualifies for large-scale capital market financings down the road,” Eckhart says.

In other words, the financial innovations that have been percolating within the clean tech industry haven’t necessarily involved cooking up new financial structures or tactics. Rather, the industry has had to figure out how to qualify for very traditional types of capital market financing structures.

So, how are they finding money?

Pooling of Smaller Projects Broadens Appeal to More Sectors

“What’s been innovative has been taking existing financing structures and applying them to a new asset class,” says Charlotte Kim, an attorney at Wilson Sonsini Goodrich & Rosati, with a practice focused on global corporate finance with particular expertise in energy, among other fields.

Kim says that one approach clean tech companies have had to take is aggregating smaller projects into larger funds since banks dealing with this sector generally don’t consider transactions below \$100 million worthwhile because of the legal and structuring costs they incur.

“That means there’s a lot of creativity going on in how to aggregate projects—pool and package smaller projects so that they can add up and be financable at scale,” she says. “I think we’ve started to see that in the residential solar space, and we’re also starting to see it in energy efficiency.” She adds that energy storage is another promising area for that approach, but that “it’s still early days” for that sector. But policy initiatives, like the announcement in October that California will mandate its major utilities to add 1.3 gigawatts of energy storage to their grids by 2020, will drive demand, and therefore financial innovation, she says. New York has signaled that it will follow in California’s footsteps with the announcement in January that it will offer incentives to reduce grid load by 100 megawatts.

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New Funds for Distributed Generation, Energy Efficiency, and Energy Storage Projects

Date	Company/Fund	Type/Sector	Investor(s)	Assets (\$M)	Focus
4/16/14	Sol Systems	Project Finance / Rooftop Solar	Hannon Armstrong Sustainable Infrastructure Capital	\$100	Debt financing of distributed solar projects.
4/16/14	Yilgly Green Energy	Project Finance/ Rooftop Solar	Shanghai Sailing Capital	\$161	Financing of distributed solar projects in China
3/26/14	Noesis Financial Services	Project Finance/ Energy Efficiency	Undisclosed	\$30	Financing of commercial energy efficiency retrofits.
3/25/14	SolarCity	Project Finance/ Rooftop Solar	BofA Merrill Lynch and Undisclosed Lenders	\$250	Financing 200MW of distributed solar, which will become securitized.
3/14/14	Green Charge Networks	Project Finance/ Energy Storage	TIP Capital	\$10	No money down customer-sited commercial energy storage.
3/11/14	Coda Energy	Project Finance/ Energy Storage	Fortress Investment Group	\$6.4	No money down customer-sited commercial energy storage.
3/3/14	Vivint Solar	Project Finance/ Rooftop Solar	Undisclosed	\$280	Tax equity financing for residential solar projects.
2/18/14	Sol Systems	Project Finance/ Rooftop Solar	Undisclosed	\$100	Debt financing for commercial and distributed solar projects.
2/14/14	RGS Energy Asset Management	Project Finance/ Commercial Solar	Altus Power America	\$150	Financing of commercial PV solar projects in the U.S.
2/11/14	New York Green Bank	Public Investment Fund	Clean energy ratepayers	\$200	Credit enhancements, loans, co-investments in clean energy, distributed generation, and energy efficiency projects in N.Y.
1/22/14	Joule Assets	Private Equity/ Energy Efficiency	High-Net-Worth Investors, Family Foundations	\$100	Financing of small commercial energy efficiency retrofits.
1/21/14	Kilowatt Financial	Project Finance/ Energy Efficiency	Citi Alternative Energy Finance	\$100	Debt financing of residential energy efficiency retrofits.
1/9/14	SUSI Partners	Private Equity/ Energy Efficiency	Insurance Companies, Pension Funds, Large Foundations	\$89	Investor in commercial energy efficiency retrofits and public infrastructure in Europe.
12/5/13	SolarCity	Project Finance/ Energy Storage	Undisclosed	N/A	Battery leases for its residential solar customers.
12/3/13	Sustainable Development Capital LLP	Project Finance/ Energy Efficiency (from Rooftop Solar)	UK Green Investment Bank	\$200	Investor in energy efficiency projects in the U.K. and China.
12/3/13	SunEdison	Project Funding/ Rooftop Solar	Wells Fargo, North American Development Bank, Rabobank	\$100	Solar PPAs with owners of distributed PV systems.
10/24/13	Stem	Project Finance/ Energy Storage	Clean Feet Investors	\$5	No money down customer-sited commercial energy storage.
6/28/13	SunRun	Project Finance/ Rooftop Solar	JP Morgan Chase	\$630	Leases of Solar PV systems for homes and businesses.
5/16/13	SolarCity	Project Finance/ Rooftop Solar	Goldman Sachs	\$500	Leases of Solar PV systems for homes and businesses.
1/15/13	Sungevity	Project Finance/ Rooftop Solar	Brighthpath Capital Partners, Lowe's, Vision Ridge, Craton Equity, Eastern Sun Capital, Energy Capital Partners	\$125	Leases of Solar PV systems for homes and businesses.

Source: CleanTechIQ New Fundings Database

Investors are getting increasingly comfortable with this concept of portfolio-based underwriting where they say, ‘Let’s not go look at every single project, but let’s look across a pool of a hundred, and get comfortable with underlying parameters that each project can fit into.’

Nikhil Garg, a vice president at Black Coral Capital, a venture capital firm focused on clean tech companies, agrees that the aggregation of smaller projects into larger pools has been a major boon for the industry.

“If you look at what clean tech project finance was five years ago, it meant financing, say, a billion-dollar concentrated solar thermal power plant in the order of hundreds of megawatts,” he says. “And today, the hottest sector in the market is residential solar and 5 to 10 kilowatts on people’s homes. That’s very different. Investors are getting increasingly comfortable with this concept of portfolio-based underwriting where they say, ‘Let’s not go look at every single project, but let’s look across a pool of a hundred, and get comfortable with underlying parameters that each project can fit into.’”

Garg believes that general concept—currently most popular in financing distributed solar projects—is likely to extend into other clean tech sectors. Energy efficiency will be the next big draw, he believes, followed by several more, including waste-to-value technologies.

Energy efficiency is a likely next target, he says, because once investors get comfortable with the fact that they’re making money by saving kilowatts rather than generating them, they’ll realize that project financing for energy efficiency is much simpler than it is for other technologies that involve tax credits. “You’re not talking about tax equity,” he says. “It’s just straight debt financing that you’re used to typically seeing. So that simplifies things.”

“Big Data” Plays Big Role in Attracting New Clean Tech Investors

Garg adds that developments in big data can help address that other major challenge—a lack of comfort among investors in various clean technologies’ historical performance.

“A key part of having efficient financing and driving down its cost is lenders’ comfort that the technology performs as advertised,” he says. “We’re now seeing a lot of arenas where you can look back at data historically in terms of how different projects have performed. I know there’s a lot of residential energy efficiency platforms out there that have aggregated massive data sets, and are using that to show the bond financing market that, ‘Hey this project performs as advertised, and there’s low risk associated with that, so lend us money at a very attractive cost to capital.’”

He adds that this increased comfort is attracting new investors to the space. While clean tech project finance was largely dominated by banks and infrastructure-oriented private equity firms as recently as five years ago, the space now has a more diverse set of investors. Garg says he’s seen an influx of family offices entering the space, as well as retail investors who are investing via REITs and yield cos that floated on the public market last year.

“By aggregating large data sets, evaluating them, and tracking that performance, you’re finding the financial community getting more and more comfortable that these are high-quality projects, and that’s driving down that cost of capital,” Garg says. “That’s an emerging success story I see.”

Keep an Eye On: Kilowatt Financial

By Amanda Gerut

Blazing the way for energy efficiency consumer financing

For a company founded by self-proclaimed “information and analytics geeks,” Kilowatt Financial has certainly become quite popular.

Since the firm was founded in 2011 with \$120 million in funding from backers including Kleiner Perkins Caufield & Byers, the consumer lending company has helped 20,000 clients finance clean energy or energy efficiency upgrades in their homes. The company recently partnered with Citi, which provided Kilowatt with \$100 million in lending strength through a project finance fund focused on consumer energy efficiency retrofits.

Marshal Salant, Head of Alternative Energy Finance at Citi Alternative Energy Finance, said in a recent *Forbes* essay on the partnership that the coupling of Citi and Kilowatt will enable securitization of the energy efficiency market.

“Institutions such as pension funds and insurance companies will now be able to invest in this area, where before they have lacked such opportunities due to scale,” said Salant in the *Forbes* piece.

And while opportunities are still few, they’re growing. Deutsche Bank this month announced that it closed the first residential energy efficiency retrofit bond securitization with a \$104 million bond in California. The bond is a property-assessed clean energy (Pace) bond, which gives governments the ability to fund energy efficiency improvements that are paid back over time by homeowners through property tax bills.

The Birth of Kilowatt Financial

For Kilowatt, the partnership with Citi allows for more flexibility in the types of financing products they can offer to consumers, and a chance to compete with the big banks.

“Part of the challenge for people like us, obviously, is that we are trying to create really attractive consumer finance products that incent consumers to take these efficiency measures,” says Daniel Pillemer, chairman and CEO at Kilowatt Financial. “Our long term goal has always been to be able to offer multiple financing alternatives to consumers.”

The senior management team at Kilowatt came together in 2007 hoping to set up a consumer lending business, but decided it wasn’t the right time. Pillemer, chief operating officer Matthew Melius and chief credit officer Robert Young were all bearish on the economy and the capital markets; it turned out to be a good call.

Several years later when the three were brainstorming about the idea of a clean energy consumer finance company, partners at Kleiner Perkins Caufield & Byers explained to the trio that they saw huge potential in the residential solar market but that there was a need for consumer finance expertise to solve the problem of financing clean energy improvements.

Then, when Pillemer, Melius and Young looked closer at the clean energy and energy efficiency landscape, they saw that consumers loved clean energy because it was good for the environment, and helps them save money, says Pillemer. Even more importantly, they saw that consumers who were borrowing money to make clean energy or energy efficiency improvements had a better repayment track record than people borrowing for other purposes.

“When you put those things together, that made us very excited,” says Pillemer. “We’re a bunch of guys who are data nerds and we know consumer lending very well, and we saw a huge opportunity to apply that expertise to the clean energy space. That is how Kilowatt Financial was born.”

Pillemer who admits to being a “huge believer in electric vehicles,” says that one of the things people underestimate is the psychological high of driving an electric vehicle largely powered by a solar photovoltaic system. Making that type of change is a gateway to making other energy-savings changes in peoples’ lives.

After the company was founded in 2011, Kilowatt focused only on solar. They’ve since broadened their focus to include energy efficiency financing. Yet, Pillemer admits that there’s still an uphill battle to climb in getting homeowners to convert to solar and make energy efficiency upgrades. Still, Pillemer is bullish for several reasons.

First, there are psychological drivers at play, he says. More and more, people are driving electric vehicles.

For example, the Union of Concerned Scientists estimated in December that 42% of U.S. households could use the electric vehicles available currently based on the number of passengers in cars, hauling needs, and average maximum week-day driving distances. And, IBM estimated in its executive report, “The Shift to Electric Vehicles,” that governments in major markets will begin formal programs to encourage drivers to shift from gas-powered vehicles to alternatively-powered cars by 2020.

Pillemer who admits to being a “huge believer in electric vehicles,” says that one of the things people underestimate is the psychological high of driving an electric vehicle largely powered by a solar photovoltaic system. Making that type of change is a gateway to making other energy-savings changes in peoples’ lives.

“Driving past a gas station knowing that your power comes from the sun... it’s just hard to quantify the value of that today,” says Pillemer.

And in solar, even though penetration is low, people are starting to buzz about how installing

solar panels impacts the value of a home, he says. More brand names are starting to gain recognition and growth continues unabated and eventually mortgage brokers will become well-versed in how these types of features impact the housing market.

Indeed, McKinsey noted in its recent report on clean tech, “Myths and Realities of Clean Technologies,” that the average annual increase in global solar PV installed capacity from 2006 to 2012 was 57%.

As for energy efficiency, the challenges there are even greater, says Pillemer. With solar, at least companies can knock on someone’s door and easily demonstrate the cost savings of converting. It’s much more difficult to knock on someone’s door and convince them to purchase a new HVAC system because of the savings, which are difficult to quantify, he says.

But despite these challenges, there’s still an “immense opportunity,” says Pillemer, because the overall paradigm of how consumers use energy is undergoing rapid change.

“There’s so much runway... and a broad opportunity across all energy savings measures.”

And, ultimately, financing these upgrades will play a critical role in the growth of clean technology and energy efficiency.

“If a consumer wants to make any clean energy or energy efficiency improvement, we want to help them finance it in the most efficient way possible for that consumer.”

IT Advancing Clean Tech Business Models

As cost reductions have created a bigger addressable market, the clean tech sector has generated more consumer and business data, enabling companies to use big data tools and software to analyze and drive down customer acquisition costs and increase access to financing.

Here are leading “FinTech” companies that are using information technology and data to advance clean tech business models and bring more capital to the sector:

Mercatus

(founded in 2009, based in Santa Clara, CA)

Provides “big data” and credit ratings on solar projects for project developers and investors, who pay a fee to use the service. Its database tools can shorten the due diligence process and accelerate securitizations of residential and commercial portfolios.

Its database tracks over 570 unique data points on 10GW of commercial, industrial and utility distributed generation solar assets. It has info on over 750 active projects, with data on: investors, panel suppliers, construction timelines, local regulations, system pricing, project timelines, etc.

It raised \$1.7 million in Series A funding from Vision Ridge Partners, Augment Ventures and Shah Capital in January and raised \$2 million from Vision Ridge Partners, Augment Ventures and Shah Capital in June 2013.

Noesis Energy

(founded in 2011, based in Austin TX)

An online platform that matches commercial and industrial energy efficiency projects with banks and investors and identifies available rebates and incentives. The financing partners who are part of the matchmaking service pay for access to investment opportunities and receive software that helps them analyze risk and measure savings on energy efficiency projects through energy data they collect on past projects.

In March, Noesis raised a \$30 million project fund to finance energy efficiency retrofits that range from \$300K to \$1 million through a “Shared Savings Agreement” modeled after the solar PPA.

It raised \$8 million in Series B funding from Black Coral Capital and Austin Ventures in Sept. 2013 and has raised \$14.5 million in VC funding to date.

Choose Energy

(founded in 2008, based in San Francisco, CA)

An energy service comparison marketplace that allows consumers to compare retail electricity plans, including solar options, and helps them enroll online in deregulated utility markets. The company receives commissions when consumers switch plans.

The data they collect on consumer preferences is shared with their energy service partners who can customize plans based on the preferences of consumers, including price, plan length, brand desire, and % of renewable energy. In fact, price is not the biggest factor for plan switching, says the company, and consumers are willing to pay a premium for plans with renewable energy.

It raised \$7.5 million in Series B funding from Kleiner Perkins, BlueScape Resources, NGEN Partners, Stephens Capital Partners and Michael Polsky in Nov. 2013. And it raised \$4 million in Series A funding from Kleiner Perkins and Stephens Capital in March 2013.

Clean Power Finance

(founded in 2007, based in San Francisco, CA)

An online marketplace for the distributed solar industry that connects providers of capital with solar marketers to expand access to financial products to more solar professionals. Its CPF Tools is software-as-a-service that simplifies complex sales, quoting, proposal and finance processes and minimizes the “soft costs” of selling solar.

The company raises 100 percent third-party owned project finance funds and manages \$500 million of project financing on behalf of fund investors. Investor capital is packaged as solar leases and PPAs and made available to solar professionals. It charges a fee to capital providers for its risk management and fund services.

It raised \$37 million in Series C funding in May, 2013 and has raised over \$65 million in VC funding to date from investors including: Hennessey Capital Management, Edison International, Sand Hill Angels, Claremont Creek Ventures, Clean Pacific Ventures, Kleiner Perkins, and Google Ventures.

Geostellar

(founded in 2011, based in Martinsburg, WV)

Uses “big data”, analytics and mapping to streamline online procurement, financing, installation, and maintenance of solar, which allows solar installers and financiers to lower the cost of acquiring new customers. It uses satellite data to build 3D representations of neighborhoods and their rooftops to calculate their solar potential, and includes data on incentives and utility rates to show consumers the cost of going solar.

Geostellar’s system, called Solar Mojo, pulls in data from multiple sources to create an estimate as well as displaying what deals are available from installers in a particular area. Consumers can then sign up for one of the solar plans on their website and Geostellar claims a portion of a system’s total installed price.

It won \$750,000 in U.S. DOE SunShot Initiative funds in Oct. 2013 and raised \$14 million in Series B funding from NRG, GeoEye, Flash Forward Ventures and the state of Maryland in June 2012. The company has raised \$28.5 million in funding to date.

kWh Analytics

(founded in 2012, based in Oakland, CA.)

Produces “big data” information tools for risk management of solar investment, creating solar information transparency that enables solar leases to be securitized. It provides information to institutional investors and industry participants who pay a fee to use the service.

The company’s database tracks over 20,000 PV systems, 3M modules, and 50,000+ inverters, representing 1GW of generating capacity in the U.S. It analyzes energy and credit data from industry stakeholders to generate insight into the performance of the solar asset class across the commercial, residential and utility scale segments.

It won \$500,000 in U.S. DOE SunShot Initiative funds in October 2013. Although they are not currently fundraising, they are “open to partnership and opportunistic situations” says CEO Richard Matsui.

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