



Five Emerging U.S. Public Finance Models:

Powering Clean-Tech Economic Growth and Job Creation



THE CLEAN-TECH MARKET AUTHORITY

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FIVE EMERGING U.S. PUBLIC FINANCE MODELS: POWERING CLEAN-TECH ECONOMIC GROWTH AND JOB CREATION

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INTRODUCTION:

We live in interesting times. Clean technologies, from solar and wind power to the smart grid, energy efficiency and green buildings, have emerged as a central driving force within a host of established and emerging economies around the world. The clean-tech sector has caught the attention of early-stage venture investors, well-entrenched multinationals, and governments large and small. But financing and supporting the continued growth of clean technologies and the jobs that come with them will not be easy. We continue to face the consequences of one of the most significant global economic crises in generations, and the credit freeze, along with the loss of tax-credit appetite by investors, has made the growth of any industry challenging, to say the least.

Clean tech (and indeed, any technology-based industry) is built on the alignment of three pillars: technology, capital, and policy. Positive support and advancements in all three pillars are necessary, in varying amounts, for an industry to grow and thrive. In today's challenging economic climate, government actions to get capital flowing again have taken center stage. The United States' \$787 billion stimulus plan, officially the American Recovery and Reinvestment Act (ARRA) of 2009, is one of the most prominent examples, along with stimulus efforts in other countries such as China, Japan, and Germany.

But even with large investments already being made in the U.S., the nation faces the very real threat of falling behind in the race to capture its share of the clean-tech sector. One reason: only a fraction of America's stimulus funding, approximately \$100 billion of the \$787 billion total, is currently earmarked for clean-tech related projects. And the prospect for more clean-tech stimulus funding in the U.S. is uncertain. Equally important, other advancements have not yet been signed into law, most notably a federal renewable energy standard (RES) mandating that a portion of the nation's electricity must come from new renewables, and a workable scheme to put a price on carbon.

In short, to gain the benefits of the clean-tech revolution – from green jobs and energy security to climate solutions and the creation of a 21st century economy – the United States needs new financial instruments that can provide the capital necessary for the rapid expansion of clean-tech industries.

Against this backdrop of uncertainty in the U.S., a number of other nations are aggressively pursuing clean-tech growth initiatives that could give their countries a competitive edge. South Korea, for example, has committed to spend approximately two percent of its GNP, an estimated U.S. \$84 billion by 2013, on environmental projects in a “Green New Deal” to spur economic growth and create a projected 1.5 million new jobs. China, by all measures, is vying to be a clean-tech powerhouse by investing heavily in its nation's build out of clean technologies. China is now home to a plethora of solar photovoltaic (PV) manufacturers, burgeoning large-scale wind farms, and the largest concentration of solar hot water heaters in the world. In the past few years, China's central government has gotten serious about its clean-tech ambitions, ramping up investments, targets, and deployment. Among numerous actions, the country has earmarked nearly 10 percent of its recent \$586 billion stimulus package for sustainable development and has established a renewable energy target of 15 percent of primary energy consumption by 2020. According to numerous reports, the

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Chinese government could end up spending an additional U.S. \$440 billion to \$660 billion toward its clean-energy build out over the next ten years.

Government spending alone does not drive markets. Technology innovation capabilities, local labor costs, the presence or absence of academic centers of excellence, customer demand, and other factors all have a critical impact on which regions win and which ones lose. The race to dominate in clean tech, in fact, will not be won by one country, region, or city. As we report in our companion Clean Tech Jobs Trends 2009 report, clean-technology centers are sprouting up all over the globe, often in unexpected places. The good news is that this will, by all accounts, be a distributed revolution.

But increased competition necessitates a concerted, all-hands-on-deck response for any country, region, or state seriously working to build its clean-tech presence. In the U.S., a growing number of innovative new ideas for public financing of clean tech provide both promise and hope. Any of these could have important, positive impacts on clean-tech economic expansion and job creation, if implemented skillfully and intelligently.

In this report, we analyze five of the most promising financing models:

- Clean Energy Deployment Administration (CEDA) aka The Green Bank
- Clean Energy Victory Bonds
- Tax Credit Bonds
- Federal Loan Guarantees
- Clean Tech City Funds

We examine each of these models – their history, current state of activity, and potential impact on clean-tech economic growth and job creation. While this report is not intended to provide in-depth analysis for the technical implementation of each model, it should help bring readers up to speed on a range of new and emerging financing opportunities -- and provide fodder for further thought and exploration.

PPAs: A Financing Model To Bring Solar to Scale

In recent years, a number of innovative financing models have enabled solar power to compete against conventional energy sources. One that really shines is power purchase agreements (PPAs). These have proven to be a strong model for financing the high upfront cost of solar power systems. A PPA is basically an agreement where a power provider (e.g., a solar company, energy services company, or renewable energy project developer) installs and owns a power generating system on a client's (e.g., business owner, utility, or government) premises. The provider charges the power purchaser a set rate for the electricity -- usually locked in for 10 to 20 years. The power provider is then entitled to the financial incentives available for installing that system (tax credits, renewable energy credits, and the like) and is responsible for its ongoing maintenance.

While PPAs remain a viable financing model, they've been hit hard by the relative lack of tax credit appetite during the current economic downturn. If investors don't have profits, they can't take advantage of tax credits. Key players in the solar field, however, say that PPAs shouldn't be written off. They are a great way to get the cost of solar off a company's balance sheet, take advantage of a range of tax benefits, and help make solar cost-competitive from Day One. A number of PPA providers have been offering solar PV at rates competitive with or even less expensive than the prevailing price of retail electricity in markets around the U.S. And with the cost of solar PV modules dropping by nearly half in the past year, putting solar in reach of ever more customers, we believe that PPAs are an innovative financing model that aren't going away anytime soon.

MODEL #1: CLEAN ENERGY DEPLOYMENT ADMINISTRATION (THE GREEN BANK)

The Clean Energy Development Administration (CEDA), aka The Green Bank, is a relatively new concept for public clean-energy financing. Plans for CEDA are working their way through the U.S. House and Senate, via provisions in both chambers' versions of pending energy legislation, and the idea has picked up considerable bipartisan support. According to the Coalition for the Green Bank, the concept is an "independent, government-sponsored enterprise to support, via loan guarantees, debt instruments and equity, the emergence of the U.S. clean-energy industry."

On the surface the idea seems promising: create an independently-operated, publicly-owned bank with the financial power and backing of the U.S. government. But how would it work?

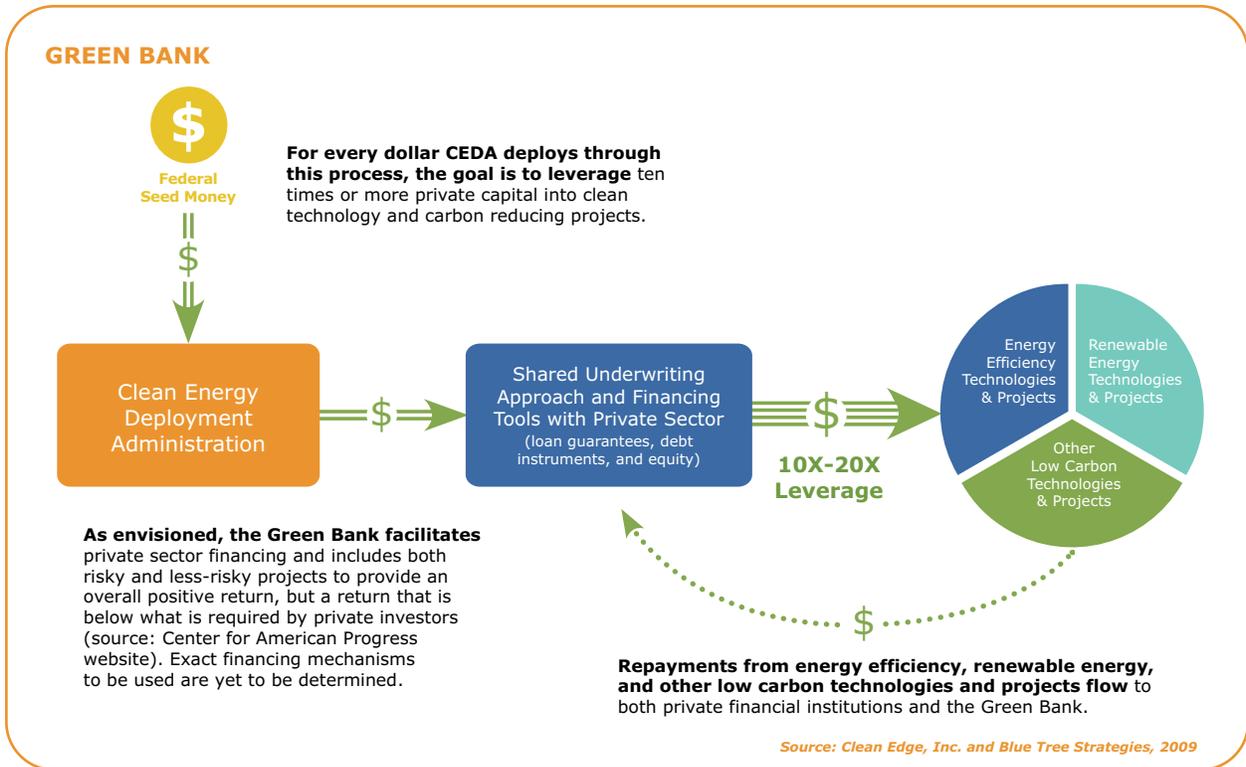
Washington, D.C. think tank The Center for American Progress, which supports the development of a green bank, states that the bank would "work closely with private banks to provide loan guarantees, credit enhancements, and other financing tools to stimulate private-sector lending and investments in projects that cannot access commercial financing on economically feasible rates and terms."

The bank could fund a range of renewable energy, energy efficiency, and low-carbon solutions. And most important, the bank is projected to leverage public funding by a factor of 10 to 20. In other words, \$10 billion invested by the bank could result in \$100-\$200 billion in total public and private investment by utilizing traditional loans, loan guarantees, and credit enhancement provisions. Not a bad way to leverage capital.

Of course, there are some concerns about how a green bank might be structured. There would need to be strong accountability to ensure that the bank isn't taking on excessive credit risk, is serving its mandate for low-carbon technologies, and isn't over-weighted in any one technology. In addition, the bank would need to address what technologies it would support. For example, would nuclear power or clean coal be eligible for investments? These and other thorny issues will need to be fully addressed and communicated.

While the concept of a green bank is new to energy, it isn't new to the U.S. Similar government investments have supported private enterprise in the past, from the build out of railroads in the 19th century to the development of ARPANET, the precursor to the Internet. And there's a rich history of quasi-governmental organizations that support investments, including the Export-Import Bank of the United States (Ex-Im), the Overseas Private Investment Corporation, and the CIA's not-for-profit venture capital arm In-Q-Tel. "The concept is a lot like the Ex-Im Bank," says former Ex-Im president and current California public utilities commissioner John Bohn. "It's designed to help fund long-term investments to build the kinds of technologies and infrastructure that we need over the next decades." A 21st century green bank could provide a similar infusion of cash and innovation for clean energy, efficiency, and low-carbon infrastructure – spawning new technologies and services that enable the U.S. to compete effectively against China, Japan, the European Union, and other nations.

\$10 billion invested by the bank could result in \$100-\$200 billion in total public and private investment.



Further Reading:

Center for American Progress: The Green Bank
www.americanprogress.org/issues/2009/05/green_bank.html

Center for American Progress: Primer on the Green Bank
www.americanprogressaction.org/issues/2009/06/green_bank_primer.html

Comparison of House and Senate CEDA provisions
www.nirs.org/neconomics/cedaprovisions0709psr.pdf

Coalition for the Green Bank
www.coalitionforthegreenbank.com

MODEL #2: CLEAN ENERGY VICTORY BONDS

The concept of Victory Bonds isn't new. Most notably during World War II, similar bonds were sold in the U.S., Canada, and other nations to support the war effort. In the U.S. the bonds were called Series E Bonds or simply "war bonds." Between 1941 and 1946, 85 million Americans, approximately 60 percent of the total U.S. population at the time, invested a cumulative \$185 billion in war bonds (more than \$2 trillion in today's dollars). The bonds had a ten-year maturity and provided a nearly three percent return on investment if held to maturity. Americans could buy a war bond with as little as \$25. During the same time period in Canada, Victory Bonds raised approximately \$12.5 billion for that nation's war effort during WWII, with rates ranging between 1.5 and three percent.

Initiatives are currently underway worldwide to replicate the war bond concept.

While the U.S. government hasn't yet launched a clean-energy victory bond effort, a number of other initiatives are currently underway worldwide to replicate the war bond concept. The World Bank, along with Scandinavian bank SEB and several other institutions, raised more than \$350 million for the first round of "green bonds" in late 2008, from which proceeds will be used to fund projects that cut carbon emissions in the developing world. World Bank Green Bonds, as they've been named, were originally issued in Swedish kronor with a six-year maturity, paying around 3 percent annual return, slightly higher than Swedish government bond rates. Similarly, in 2007, the European Investment Bank (EIB), a nonprofit long-term lender in the EU, issued more than 1 billion euros worth of its AAA-rated Climate Awareness Bonds. Money raised from issuing the bonds is earmarked for EIB lending to renewable energy and energy efficiency projects.

Similar bonds on the drawing board include Climate Change Capital's "environment bonds" and Action Canada's "green bonds."

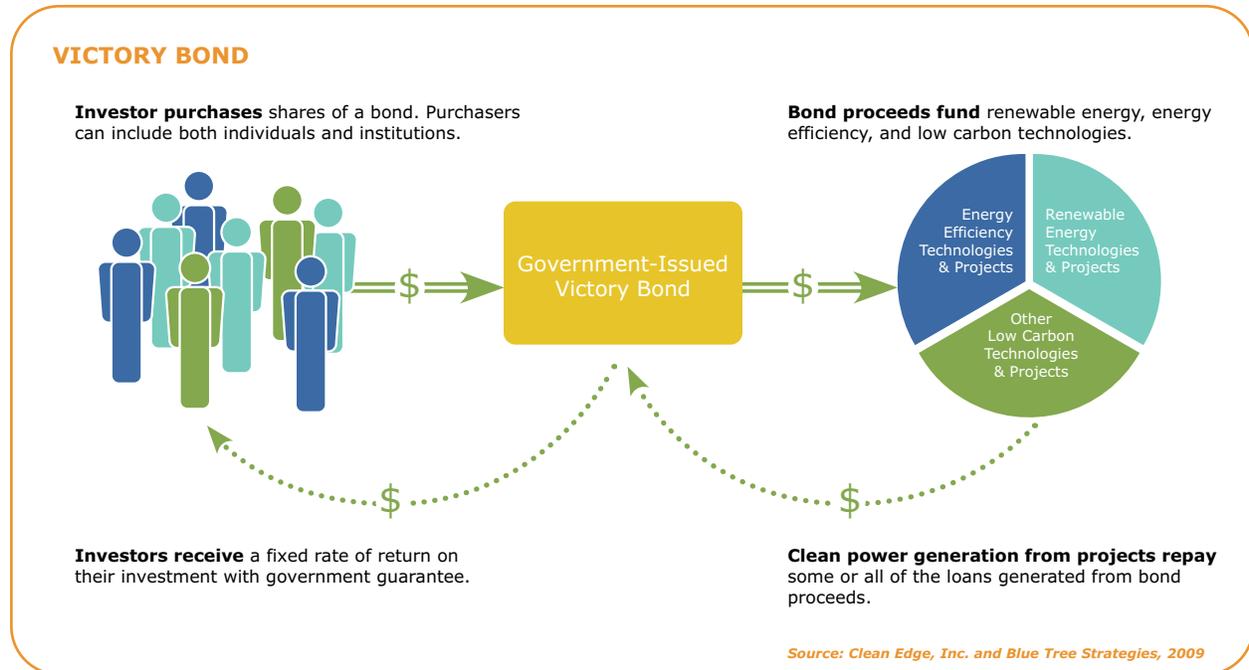
There's also some precedent in the U.S. In 2004, the United States Treasury's Brownfields Demonstration Program for Qualified Green Building and Sustainable Design Projects (otherwise known as Green Bonds), authorized up to \$2 billion in bonds for states and cities to finance environmentally friendly development and reclaim contaminated industrial and commercial land.

One of the most appealing aspects of Clean Energy Victory Bonds, as we envision them, is that they could potentially democratize the financing of clean tech – enabling anyone with a savings account to invest in clean-energy deployment in a safe, government-backed security. In today's investment environment, a bond that returns between 3 to 5 percent annually, supports clean-energy development and national security, and is backed by the U.S. government should prove popular.

There are certainly issues that would need to be addressed. How would the bond's advisors or board decide which technology deployments to invest in and how would they define "green?" What type of fees would need to be allocated to cover the cost of managing a bond with potentially millions of investors?

But we think clean-energy victory bonds are a model worth pursuing. As was done with WWII bonds, we envision a national promotional campaign with advertisements and calls-to-action on buses, subways, radio, and TV – along with today's new communications channels -- websites,

blogs, cell phones, Twitter, and elsewhere. But instead of asking Americans to sacrifice, the bonds would ask people to invest in the future of U.S. jobs, energy security, and global competitiveness. This model could be a true win-win-win for individuals, the government, and companies at the forefront of deploying the nation's clean-tech arsenal.



Further Reading:

Green Bonds (Canada)

www.greenbonds.ca/index2.html

Green Bonds (USA)

www.greenbonds.com

Climate Awareness Bonds (EIB)

<http://businessresponsible.libcast-corp.com>

Green Bonds (World Bank)

<http://treasury.worldbank.org/cmd/htm/300millionGreenBonds.html>

Renewable Energy Investment Notes (New Generation Energy)

www.newgenerationenergy.org

Renew America Bonds

www.api.ning.com

MODEL #3: TAX CREDIT BONDS

There are several types of federal bonds that offer bondholders a federal tax credit partially or fully in lieu of interest payments. Three with the best potential to fund clean-energy projects and create jobs include Clean Renewable Energy Bonds (CREBs); Qualified Energy Conservation Bonds (QECBs) and Build America Bonds (BABs).

With each model, the Internal Revenue Service essentially authorizes a bonding authority (such as a city, state, or Native American tribal government) to issue federal tax credits as payments to the bond buyer. This gives the bonding authorities additional options for raising the money necessary to fund bonded projects in energy, transportation, construction and other areas. And it provides investors with a product that offers tax credits.

CREBs were originally established by the federal Energy Policy Act of 2005, then expanded by Congress with an additional allocation of \$800 million in 2008 and \$1.6 billion in the stimulus package (ARRA) of 2009. CREBs proved quite useful before the recession when tax credits were more attractive to investors; these bonds funded more than 900 clean-energy projects with \$1.2 billion.

QECBs, targeted at energy efficiency projects, were launched as part of the Congressional bailout package in October 2008 then expanded to \$3.2 billion in funding authority by ARRA. QECBs are zero-interest, 100 percent tax credit bonds. They are among the most versatile financing models, eligible for a range of projects including green-building technologies, mass-transit improvements, conversion of agricultural wastes, and even public education campaigns to promote energy efficiency.

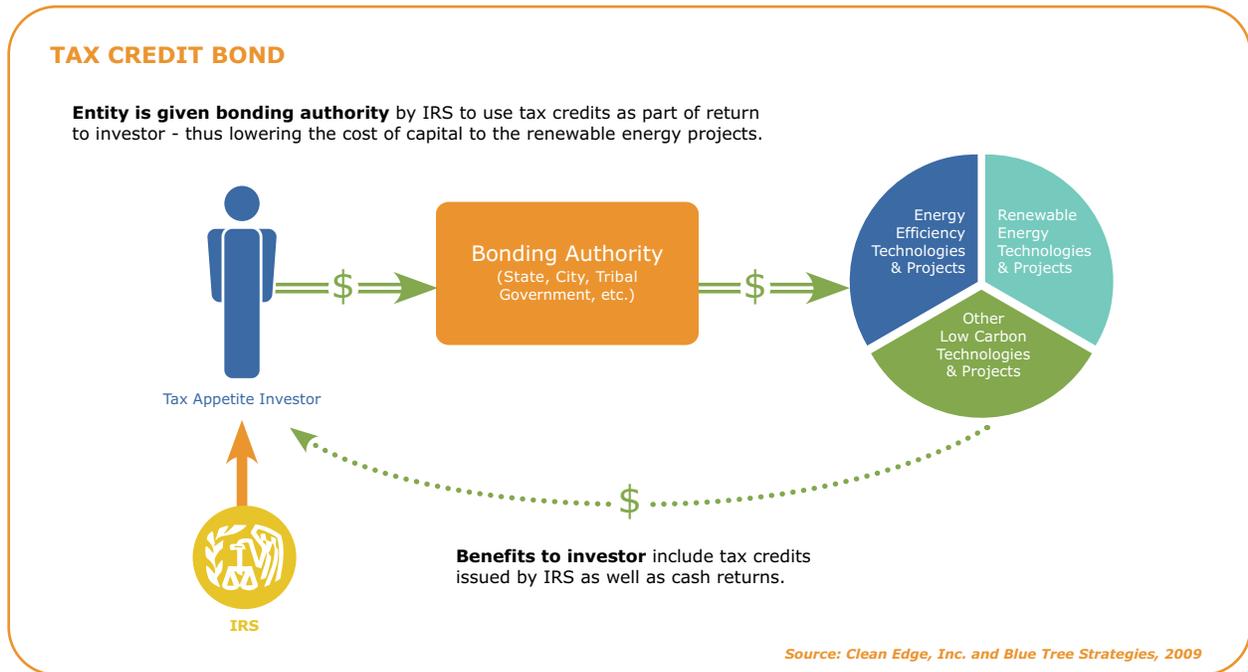
BABs are the newest of these three models, a new category of municipal bonds introduced with the passage of ARRA in February 2009. They are a broader category to fund all types of capital improvement projects, not just energy – roads, bridges, water systems, and the like. BABs have proven extremely popular, even in the current climate, because of one key feature. Instead of offering a tax credit to their bond buyers in a BAB- Tax Credit, bond issuers may opt for a BAB-Direct Payment and receive a direct federal subsidy equal to 35 percent of the interest they would normally pay out – cutting the effective interest rate by more than a third. By late summer of 2009, \$27 billion worth of BABs had been issued, or about one-third of all U.S. municipal debt since the inception of the program. BABs have not yet been used for clean-energy projects, but have plenty of untapped potential to make that happen.

Although all three models are sound policy tools, they all (with the exception of the BAB-Direct Payment) face the same problem in a recessionary economy: the overall lack of an appetite for tax credits. While tax credit bonds had good success before the financial meltdown of 2008, they now face a hurdle of simple fiscal logic. When few investors are earning positive returns on which to pay taxes, there's not much call for tax credits.

"It's too kind to call the tax equity market weak – it's nonexistent," says Richard Ashby, CFO of wind power developer RES Americas in Denver. And some of the world's biggest former investors

While tax credit bonds had good success before the financial meltdown of 2008, they now face a hurdle.

in tax-credit vehicles, such as AIG, Wachovia, and Lehman Brothers, are now severely weakened or nonexistent themselves. So in the near term, we believe the outlook for tax credit bonds funding clean-energy projects will continue to be limited by this overall lack of demand for tax credits as an investment vehicle. But in coming months and years, as the economy recovers, we believe that these various tax credit bonds do hold great promise as clean-energy funding models.



Further Reading:

Clean Renewable Energy Bonds (CREBs)

www.crebs.org

Qualified Energy Conservation Bonds (QECBs)

www.gilmorebell.com/Qualified_Energy_Conservation_Bonds.pdf

Build America Bonds (BABs)

www.energycenter.org/index.php/public-affairs/federal-legislation/1285-build-america-bonds-babs

Tax Credit Bonds and the Federal Cost of Financing Public Expenditures

www.cbo.gov/ftpdocs/56xx/doc5624/07-08_TaxCreditBonds.pdf

MODEL #4: FEDERAL LOAN GUARANTEES

Government loan guarantees have a long history, and in the past have helped some notable American corporate icons, such as Lockheed and Chrysler, to stay in business. Bringing this legacy to clean energy, the U.S. Department of Energy's Loan Guarantee Program, established in the Energy Policy Act of 2005, sounded great in theory and simple in concept. For a range of clean-energy-related projects, the feds would act as a guarantor for banks and other lenders who might balk at a loan because of project uncertainty, default risk, lack of traditional collateral, or other reasons.

These recent deals show a strong ray of hope for what the loan guarantee program can achieve.

But reality has been a different matter. An expensive and laborious application process, onerous red tape, and the need to hire outside consultants, lobbyists, and legal counsel just to navigate the process had kept most prospective recipients away from the program. In addition, the DOE under the Bush administration did not proactively encourage the program. It took nearly four years, until March 2009, for DOE to announce its very first loan guarantee: \$535 million to solar PV panel maker Solyndra. "The original program had significant bureaucratic and procedural hurdles and was not particularly useful," says Scott Nelson, attorney at law firm K&L Gates and a former DOE staff member, "Secretary Chu's streamlining of the process and more staff resources for the program will hopefully change that situation."

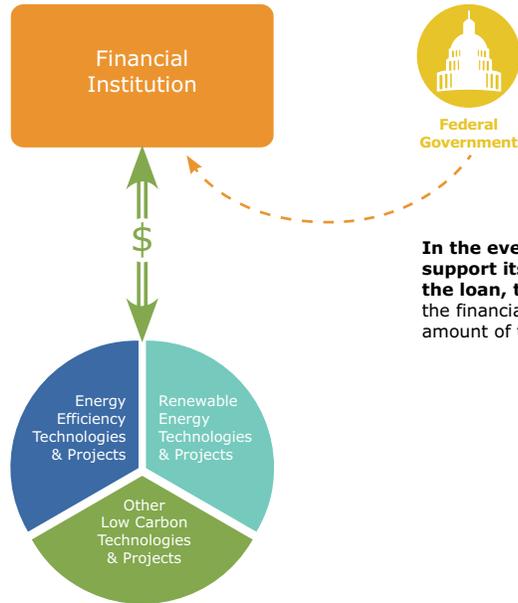
The U.S. Department of Agriculture also offers a loan guarantee program for biorefineries producing advanced (i.e. not from corn) biofuels -- a more modest \$320 million funding pool created in the Farm Bill of 2008. In January 2009, Range Fuels received the first USDA loan guarantee for cellulosic ethanol, on an \$80 million loan to help build its refinery to make ethanol from wood waste in Soperton, Georgia.

These recent deals show a strong ray of hope for what the loan guarantee program can achieve. The DOE guarantee will help Solyndra fund the first phase of its new PV manufacturing plant in Fremont, California, creating 3,000 construction jobs, with the facility eventually employing approximately 1,000 workers. President Obama and Secretary of Energy Dr. Steven Chu have been much more aggressive in supporting the program, and in July 2009 Chu announced an additional \$30 billion in DOE loan guarantees, plus \$750 million for electric transmission projects that commence before 2011. "Secretary Chu's streamlining of the process and more staff resources for the program are hopefully changing things for the better," says Gates.

Other recent loan guarantee recipients include wind energy developer Nordic Windpower USA, energy storage technology provider Beacon Power, and auto manufacturers Ford, Nissan North America, and Tesla Motors to speed development of electric and fuel-efficient vehicles. Two Colorado-based PV makers, Abound Solar and Ascent Solar, are among about 160 additional clean-tech players seeking loan guarantees in fall 2009. After years of languishing, thanks largely to revitalized support from a new administration, DOE and USDA loan guarantees finally seem poised to be an effective clean-energy financing tool.

LOAN GUARANTEE

This structure makes it more attractive for banks to lend to technologies and projects that are risky or lack familiar collateral.



In the event the project is unable to support its debt service and defaults on the loan, the federal government pays the financial institution a pre-designated amount of the loan principal.

Source: Clean Edge, Inc. and Blue Tree Strategies, 2009

Further Reading:

US DOE Loan Guarantee Program

www.lgprogram.energy.gov

USDA: Business and Industry Guaranteed Loans

www.rurdev.usda.gov/rbs/busp/b&ti_gar.htm

DOE Webinar: Loan Guarantee Program – “Suggestions for a Strong Application”

www.lgprogram.energy.gov/webinars/HTB-StrongApplication3.pdf

DOE Loan Guarantee Solicitation: Commercial Technology Renewable Energy Generation Projects

www.lgprogram.energy.gov/CTRE.pdf

DOE Loan Guarantee Solicitation: Transmission Infrastructure Investment Projects

www.lgprogram.energy.gov/2009-CPLX-TRANS-sol.pdf

MODEL #5: CITY FUNDS

Among the more innovative clean-energy financing models in the U.S. are city-administered loan funds springing up from coast to coast. Particulars vary considerably from city to city, but in the basic model, homeowners borrow the funds necessary to pay for a solar array or an energy efficiency upgrade – then repay the loan (often at below-market rates) over a long-term period through their property tax or utility bill.

Not surprisingly, the cities at the forefront of this model are those considered most politically progressive in both population and government: Berkeley, California; Portland, Oregon; Cambridge, Massachusetts; and Boulder, Colorado. But the concept has spread fast to less obvious locales, including Palm Desert, California, and Babylon, New York. Some examples are also emerging at the state level, with Colorado, Connecticut, New Jersey, Oregon, and Pennsylvania among those weighing plans.

Berkeley took the lead with its Finance Initiative for Renewable and Solar Technology (CityFIRST) program, launched in November 2008. Its first phase of \$1.5 million in available loans was completely reserved by applicants in nine minutes, and is funding solar installations on 38 homes. The city council has authorized up to \$80 million in bonding authority for future phases.

Although they're still nascent, we believe that city (or state) funds have great potential to finance clean energy.

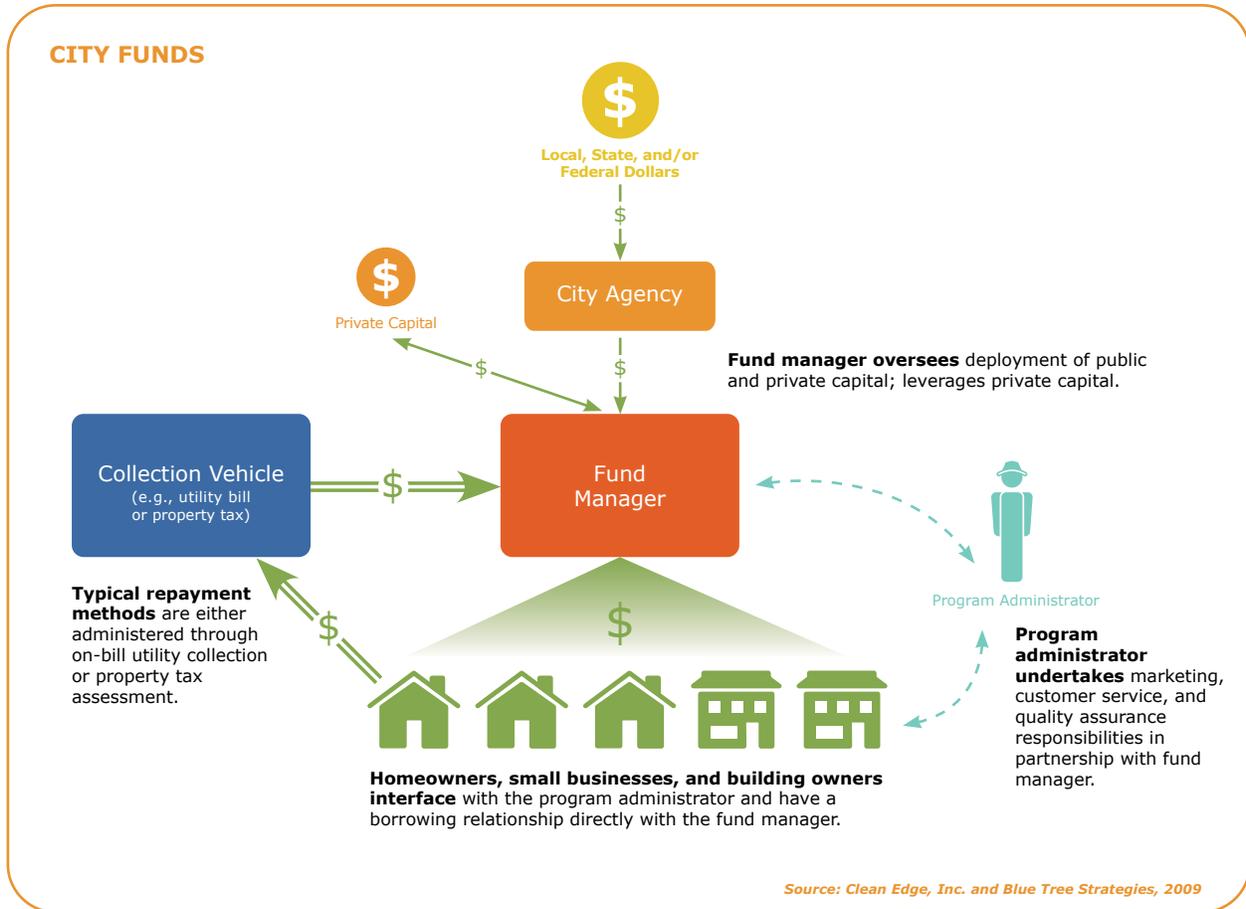
Since these models essentially use municipal funds to finance improvements to private property, the key to approval is convincing local lawmakers that efficiency improvements and renewable power generation each qualify as a public benefit. A city raises funds with a municipal bond issue, say for \$5 million, then uses the money for moderate-sized loans – roughly \$5,000 to \$25,000 – to fund homeowners' energy improvements. Bondholders' risk is low as the loans are collateralized with the borrower's home.

The Portland model is partially funded by federal stimulus dollars, in the form of an energy efficiency and conservation block grant (EECBG), to provide \$2.5 million to community development bank Shorebank Enterprise Cascadia to issue loans (covering efficiency improvements, not solar) to homeowners. In Portland, borrowers repay the money not through property taxes but on their monthly gas or electric bills.

Portland officials are hoping the program will grow enough that it can become a revolving loan fund, where the repayments plus interest generate enough income to create new loans. And it has already created a new clean-tech job category: an “energy advocate” – who serves as the homeowner/borrower's primary contact, works with the efficiency or weatherization contractor to ensure quality on the job, and helps conduct an audit to make sure the project achieves the promised energy savings.

Although they're still nascent, we believe that city (or state) funds have great potential to finance clean energy (particularly solar) and efficiency projects at the most local level there is – individual homes, and in some cases, small businesses. A municipal government can enact and grow a program even in a recession, as the cities mentioned here have done. To be sure, this model faces challenges

that range from potentially low homeowner participation rates to energy-efficiency upgrades that don't deliver the promised energy savings. But the city funds model has emerged as an innovative and effective method to finance distributed clean-energy generation and energy efficiency. There is also an effort, launched at the Clinton Global Initiative conference in September 2009 by financiers Jeffrey Tannenbaum and Jack Hidary, to establish a nationwide fund for city-level efforts called PACENOW, with PACE standing for Property Assessed Clean Energy. The various programs across the U.S. will surely experience growing pains, but we nonetheless expect to see more cities adopt them.



Further Reading:

Berkeley (CityFIRST)

www.ci.berkeley.ca.us/ContentDisplay.aspx?id=26580

Portland (Clean Energy Works)

www.cleanenergyworksportland.org/index.php

Enabling Investments in Energy Efficiency

www.uc-ciee.org/energyeff/documents/resfinancing.pdf

PACENOW

www.pacenow.org

CONCLUSION:

The public financing models discussed here could go a long way toward funding a range of clean-energy deployments in the U.S., from large-scale wind farms to a major ramp up in solar to a revamped electric grid. In this report, we examined five emerging financing models that stand to change the game in Washington, D.C. and be felt from Main Street to Wall Street. These financing schemes, if implemented properly, could give the U.S. a significant upper hand in being a clean-tech beacon, along with China and other nations vying for a leadership role.

Indeed, for too many years, clean-tech leadership has resided mainly at the state level. If the U.S. wants to have a significant, defensible clean-tech position, the federal government will need to step up to the plate. The federal models noted in this report, such as Clean Energy Victory Bonds and the Green Bank, could help the federal government be a true leader in moving the nation to a clean-energy economy – a role that President Obama says he embraces.

Four key lessons emerge from this report:

1. If we want to move forward and garner the benefits of a clean-energy future – job creation, energy independence, climate and pollution mitigation, and economic competitiveness – we must have active federal involvement to finance clean-energy development at the city, state, regional, and federal levels
2. We need strong and innovative federal clean-energy financing mechanisms to provide a framework for clean-energy deployment
3. We need solid, predictable, and long-term federal regulatory and policy frameworks and supports. Among the many potential actions we'd like to see are:
 - a. standards setting and guidance for smart grid deployment and renewables integration
 - b. a nationwide price on carbon, with the option of EPA regulation of green house gas emissions
 - c. a strong federal renewable energy standard
 - d. a shift in energy subsidies away from imported fossil fuels to domestic clean energy
4. The financing models outlined in this report are not mutually exclusive. We believe we'll see a combination of the above models coming to fruition – serving city, state, regional, and federal activities. Indeed, as with clean-energy technologies themselves, there is no single “silver bullet” solution among the emerging public finance models. We will need a robust combination of several financing mechanisms to ensure the continued growth of U.S. clean energy and the benefits that come with it.

By deploying the models outlined in this report, the federal government can support the growth of American technological ingenuity, assist regional, state and local efforts to expand clean energy, and ensure the nation's economic competitiveness and leadership deep into the 21st century. If not,

we risk ceding clean-tech leadership to China, South Korea, Japan, the European Union, and other nations that are making clean-tech development a true cornerstone of their stimulus and economic development efforts.

CLEAN EDGE, INC.

Clean Edge, Inc., founded in 2000, is the world's first research and publishing firm devoted to the clean-tech sector. The company, via its publications, events, and online services, helps companies, investors, and governments understand and profit from clean technologies. Clean Edge, with offices in the San Francisco Bay Area and Portland Oregon, offers unparalleled insight and intelligence on emerging clean-tech trends, opportunities, and challenges. Among its many activities, the company publishes the annual *Clean Energy Trends* and *Clean Tech Job Trends* reports; produces the annual Clean-Tech Investor Summit (along with IBF); maintains a number of benchmark clean-tech stock indexes with NASDAQ OMX including CELS, QWND, and QGRD; and produces Clean Edge Jobs, a leading source for clean-tech job seekers, employers, and recruiters. To keep abreast of the latest clean-tech news; access industry reports; learn more about our services; or sign up for our free e-newsletters; visit www.cleantech.com or email us at info@cleantech.com.

GREEN AMERICA

Green America, (<http://www.greenamericatoday.org>) is the nation's leading green economy organization, advancing marketplace solutions for our country's most serious social and environmental problems. Green America harnesses economic power – the strength of consumers, investors, businesses, and the marketplace – to grow the green economy, stop corporate abuse, curb climate change, and help people and businesses everywhere make economic choices that are good for people and the planet.

AUTHORS

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Clint Wilder, contributing editor for Clean Edge, is an award-winning technology and business journalist. His book *The Clean Tech Revolution* (with co-author Ron Pernick), has been called “the best clean tech book” by ClimateProgress.org and has been translated into six languages.

DISCLOSURE

Information contained in this report is not intended to be used as a guide to investing, and the authors make no guarantees that any investments based on the information contained herein will benefit you in specific applications, owing to the risk that is involved in investing of almost any kind.

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And a big thanks to our friends and collaborators at Blue Tree Strategies for their assistance in developing the financial flow charts in each of the finance model sections. Blue Tree provides consulting services on clean-tech project finance, carbon accounting/management, and strategic planning for sustainability. Blue Tree was a key program designer for Clean Energy Works Portland, a leading model in the nation for implementation of EECBG dollars towards energy efficiency retrofits.