National Renewable Energy Laboratory
Innovation for Our Energy Future

Energy Analysis

Fact Sheet Series on Financing Renewable Energy Projects

Financing Public Sector Projects with Clean Renewable Energy Bonds (CREBs)

Clean renewable energy bonds (CREBs) present a low-cost opportunity for public entities to issue bonds to finance renewable energy projects. The federal government lowers the cost of debt by providing a tax credit to the bondholders in lieu of interest payments from the issuer. Because CREBs are theoretically interest free, they may be more attractive than traditional tax-exempt municipal bonds.

In February 2009, Congress appropriated a total of $2.4 billion for the "New CREBs" program. No more than one-third of the budget may be allocated to each of the eligible entities: (1) governmental bodies, (2) electric cooperatives, and (3) public power providers. Applications for this round of "New CREBs" were due to the Internal Revenue Service (IRS) on August 4, 2009. There is no indication Congress will extend the CREBs program; thus going forward, only projects that are already approved under the 2009 round will be able to issue CREBs. This factsheet explains the CREBs mechanism and provides guidance on procedures related to issuing CREBs.

On October 27, 2009, the U.S. Department of the Treasury announced the allocation of $2.2 billion of issuing authority for "New CREBs" to successful applicants. Per IRS Notice 2009-33, the IRS plans to reallocate any unallocated volume cap as well as any relinquished or reverted allocations. Because $191 million of the volume cap for electric cooperatives was not allocated on October 27, there may be a supplemental allocation round for cooperative projects.

CREBs Funding

- **2005.** CREBs were created under the Energy Tax Incentives Act of 2005 (and detailed in Internal Revenue Code Section 54). The CREBs program was funded at $800 million.
- **2006.** Legislation increased total CREBs funding to $1.2 billion.
- **2008.** The Energy Improvement and Extension Act of 2008 (the "Energy Act") authorized $800 million of "New CREBs" funding and extended the issuance deadline for existing CREBs by one year to December 31, 2009.
- **2009.** The American Recovery and Reinvestment Act of 2009 (the "Recovery Act") increased the "New CREBs" allocation by $1.6 billion, bringing the "New CREBs" total to $2.4 billion.

How it Works

With CREBS, a type of tax credit bond, the investor receives a tax credit from the U.S. Department of the Treasury (Treasury Department) rather than an interest payment from the issuer. However as discussed below, in many cases the tax credit provided to investors has been insufficient and investors have required issuers to pay supplemental interest payments or issue their bonds at a discount. Tax credit bonds differ from traditional tax-exempt municipal bonds in several ways.

- **Tax-exempt municipal bonds.** The issuer makes cash interest payments. The federal government exempts this interest income from federal taxes, thereby allowing an investor to offer bond rates that are lower than those for a corporate bond of similar credit rating.
- **Tax credit bonds.** The federal government provides the investor with tax credits in lieu of interest payments from the borrower, theoretically subsidizing municipal borrowing completely.

Application and Allocation Procedure

The CREBs program is administered by the IRS. Each time Congress makes a CREBs authorization, the IRS issues guidance soliciting applications from qualified entities with qualified projects. In April 2009, the IRS published an application and related guidance for securing "New CREBs" allocations (U.S. Department of Treasury 2009a). These applications were due to the IRS on August 4, 2009. Projects eligible for allocations include facilities that generate electricity from a variety of sources including, wind, solar, closed-loop biomass, open-loop biomass, geothermal, small irrigation, qualified hydropower, landfill gas, marine renewables, and trash combustion. Projects that receive allocations in this round will have three years to issue the bonds.

The Energy Act specifies that up to $800 million will be awarded to each category of applicant: governmental bodies, cooperative electric utilities, and public power providers. For governmental bodies and electric cooperatives, the Treasury Department will make awards to eligible projects, from smallest to largest project, until either the $800 million for each category has been exhausted or all applications have been granted. Awards to public power providers, namely

municipal utilities, are no longer made on a smallest to largest project basis. The "New CREBs" methodology allows all eligible projects, regardless of project size, to receive funds. Public power providers will receive a pro-rata share of the overall allocation of funds in this category (U.S. Congress House 2008). Each project will be allocated a portion of the $800 million, based on the fraction of its total request to the total requested for all public power projects (U.S. House 2009).

The CREBs Tax Credit and Term

The tax credit received is calculated by multiplying the current tax credit rate by the CREB's outstanding principal. The tax credit is calculated quarterly and can be claimed against regular income tax liability or alternative minimum tax liability. Unlike the interest on traditional tax-exempt bonds, the CREBs tax credit is considered taxable income (i.e., as if it were interest income for the investor).

Because longer bond terms mean longer-lasting tax benefits for investors but increased costs to the Treasury Department, the CREBs program limits the maximum term of the bonds. Term limitations are currently on the order of 14 to 15 years.[1] Thus, as interest rates (including applicable federal rates) fall, the maximum maturity of a CREB rises. Waiting to lock into a bond with a longer maturity might make sense if interest rates are expected to fall. For example, the long-term adjusted applicable federal rate (AFR)[2] fell from 4.56% in April 2009 to 4.53% in May 2009, resulting in an increase in the maturity limit from 14 to 15 years for bonds issued in May.

The Treasury Department must set the credit rate such that the issuer need not discount the bond nor pay additional interest payments (Internal Revenue Code Section 54A(b)(3)). For the first two rounds of CREBs in 2006 and 2007, the Treasury Department determined the tax credit rates based on the market rate for AA-rated corporate bonds (U.S. Department of Treasury 2007). However, this method proved problematic because many municipalities had credit ratings lower than AA and were unable to borrow at a rate equivalent to the AA corporate rate; i.e., their borrowing rate was higher. Additionally, investor demand was limited because investors were unfamiliar with the instrument and because the size of the bonds tends to be small (IRS typically allocates funds from the smallest to the largest). Consequently, many issuers have had to discount the bonds or have agreed to pay supplemental interest to attract investors (Serchuk 2008). In addition, many potential issuers decided against issuing CREBs when the transaction costs and interest payments were higher than originally anticipated. In light of this market reaction, the Treasury Department modified its methodology for determining the tax credit rate. For "New CREBs," the Treasury Department bases the tax credit rate on yield estimates on outstanding bonds with investment grade ratings between "single A" and BBB for bonds of a similar maturity (U.S. Department of Treasury 2009b).

"New CREBs" reduce the annual tax credit rate allowed. Before the recent program changes, CREBs issuers were required to repay a fraction of the principle annually over the term of the loan, such that the investor received a tax credit on the full amount of the bond for the full term. Under "New CREBs," borrowers will repay the entire principal at the bond's maturity. As a result, the Energy Act reduced the annual tax credit rate allowed to 70% of the rate determined by the IRS (Hunton & Williams 2008). Table 1 shows recent rates published by the Treasury Department, with and without the 70% credit reduction. Given the current rates, issuers are likely to have to pay some supplemental interest (see Analysis section below).

Table 1. Tax Credit Rates, Maturities, and Permitted Sinking Fund Yields for "New CREBs" in June 2009

Date	Rate	Maturity	PSFY*	70% Reduction
5/29/2009	7.90%	15 yrs	4.98%	5.53%
6/10/2009	7.88%	16 yrs	4.66%	5.52%
6/11/2009	7.98%	16 yrs	4.66%	5.59%
6/12/2009	7.90%	16 yrs	4.66%	5.53%
6/15/2009	7.59%	16 yrs	4.66%	5.31%
6/16/2009	7.54%	16 yrs	4.66%	5.28%
6/17/2009	7.43%	16 yrs	4.66%	5.20%
6/18/2009	7.59%	16 yrs	4.66%	5.31%
6/19/2009	7.41%	16 yrs	4.66%	5.19%
6/22/2009	7.32%	16 yrs	4.66%	5.12%

* Permitted Sinking Fund Yield (PSFY) is the return allowed on a reserve fund for the project.

Source: U.S. Department of the Treasury 2009c. Rates found at https://www.treasurydirect.gov/govt/rates/irs/rates_qtcb.htm

For example, if the recipient of an allocation were to issue a CREB on June 22, 2009, the term would be 16 years and the tax credit interest rate would be 5.12%. If the risk profile of a given project were such that the market required a rate

[1] The maximum term of a CREB is set by the Secretary of the Treasury and is based on a quantitative estimate of the present value of half the bond. The discount rate is equal to 110 percent of the long-term adjusted applicable federal rates (AFR), compounded semi-annually, for the month in which the bond is sold (U.S. Department of the Treasury 2009a). First, half of the face value of the bond is assumed to be the balance in year one. Then, the 110% discount rate is applied to determine the present value of the loan during each 6-month period. Once the discounted amount of the loan balance reaches the face value of the bond, the total years of the term of the CREBs is determined.

[2] Each month, the IRS provides various prescribed rates for federal income tax purposes. The IRS publishes these rates, known as applicable federal rates (or AFRs), as revenue rulings.

greater than 5.12%, the issuer would have to make supplemental interest payments to sufficiently compensate the investor. As previously mentioned, in practice, the tax credit rate has not been sufficient for investors and supplemental interest payments have been required. This trend is likely to continue, especially now that the "New CREBs" program uses a 70% reduction rate.

With the passing of the Energy Act, lawmakers also sought to increase the liquidity of CREBs and expand the buyer base for the bonds. Investors are now permitted to strip the tax credits from principal payments and to sell them separately. For example, a bondholder who does not have sufficient tax liability can sell the right to the tax credit to someone who does have a tax appetite. Additionally, unused credits can be carried over indefinitely (Hunton & Williams 2008). These provisions are expected to make CREBs more liquid and attractive in the marketplace.

Guidance for Issuers

Upon receiving an allocation, a qualified issuer (i.e., a state, local or tribal government, cooperative electric company, public power provider, or CREBs lender that has an outstanding loan to a publically owned utility) can issue a CREB for a qualified renewable energy facility. IRS Notice 2009-33 specifies that "New CREBs" must be issued within three years after the allocation date. The IRS requires written notification from qualified issuers as soon as they determine that the bonds will not be issued within three years. Upon receiving such notification, the IRS considers an allocation to be forfeited. Unused allocations revert to the IRS and are reallocated (U.S. Department of Treasury 2009a).

A qualified borrower can use CREBs proceeds to reimburse qualified expenditures (i.e. development costs or equipment down payments incurred prior to receiving the allocation) as long as reimbursement occurs no later than 18 months after the original expenditure. The borrower must declare intent in the project-financing plan, before the first project expenditure,[3] to use the proceeds of a CREB for reimbursement. Timing is important; the reimbursement window is 18 months, and reimbursable costs can only be claimed after the allocation is approved (Lamb and Jones 2008).

In the first two rounds of CREBs, issuers were required to make equal annual installment payments over the term of the bond. For "New CREBs," the Treasury Department lifted the straight-line principal amortization requirement so that an issuer can repay the entire principal on the final maturity date (a "bullet maturity") (U.S. Congress House 2008). Consequently, the investor is entitled to a tax credit on the bond's full-face amount for its entire life. This change eliminated the

[3] Alternatively, borrowers can declare this intent in writing no later than 60 days after the original expenditure.

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particularly thorny problem of an early first principal repayment for the issuer,[4] which was cited as a barrier in previous rounds (Cory et al. 2008).

One-hundred percent of available project proceeds (APP) must be used on qualified expenditures within three years of the date of issuance. Available project proceeds include the bond proceeds and any investment earnings on these bond proceeds, less issuance costs. Qualified expenditures consist of capital expenditures for a qualified project. Thus, costs that are not capital expenditures cannot be funded from the available project proceeds. Non-qualified costs include items such as debt service reserve funds and project working capital. Technically, the costs of issuance are also non-qualified costs, but under a special rule, proceeds of the CREBs can be used to fund costs of issuance in an amount up to 2% of the CREBs sale proceeds. Any costs of issuance in excess of the 2% limit must be paid from other sources of funds.

At the time of issuance of the CREBs, the issuer must reasonably expect to spend 10% of the APP within 6 months and 100% of the APP by the third anniversary of issuance. The three-year expenditure period is considered a hard deadline. However, a "relief valve" in the statute does permit issuers to apply to the IRS for an extension if they can show that failure to meet a deadline is due to reasonable cause and that they will proceed with due diligence to complete the project and expend the remaining APP. Any amount unspent after three years (as the same may be extended) must be used to redeem an equal amount of the outstanding CREB.

CREBs, like tax-exempt bonds, are subject to the investment yield restrictions and arbitrage-rebate requirements under IRC Section 148. However, the Energy Act liberalized the arbitrage rules for CREBs proceeds during the construction period,[5] and investment returns on the bond proceeds

[4] A fraction of the principal was due in December of the year the bond was issued.

[5] In previous rounds of CREBs, developers who invested money during the construction period had to pay to the IRS earnings in excess of the cost of borrowing.

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invested during the three-year construction spending period are now exempt from arbitrage restrictions.

Furthermore, an invested sinking fund[6] option was created under the "New CREBs" legislation. Issuers can set aside project revenues (or other funds, such as tax revenues in the case of general obligation bonds) in equal installments annually to an invested sinking fund in order to accumulate the funds needed to pay the CREBs when due.

For this fund to comply with arbitrage-rebate rules, it is expected to be used to repay the issue. The issuer can invest this sinking fund, but the yield on any such investments cannot exceed the discount rate used to determine the maximum maturity on the bonds (Hunton & Williams 2008).[7]

[6] The title to IRC Section 54A(d)(4)(C) refers to this as a "reserve fund." However, this term can confuse those familiar with the law of tax-exempt bonds because it customarily refers to a "debt service reserve fund," which consists of money set aside for paying debt service if and only if the issuer encounters financial difficulties and has no other funds to pay debt service. Rather, the provision under discussion here relates to what is usually called an "invested sinking fund"–a fund set up to accumulate money to pay scheduled debt service. For example, if $1 million in principal is due in five years, an investor may be concerned about the issuer's ability to produce the entire $1 million in year five. To alleviate this concern, the issuer may create a covenant to set up an invested sinking fund into which the investor will pay and set aside $200,000 from project revenues each year. In this way, the $1 million will be on hand in year five and the investor can pay the amount due. (Because payment of debt service on the CREBs is not a qualified cost, project revenues—not CREBs proceeds—must fund the invested sinking fund.) An invested sinking fund is a type of "reserve fund" broadly speaking, but it needs to be distinguished from the debt service reserve fund found in many tax-exempt bond issues. For regular tax-exempt bonds (i.e., those that bear tax-exempt interest in lieu of granting tax credits), a debt service reserve fund can be funded with the bond proceeds (subject to limits set forth in the Code and Regulations). But, as noted above, no portion of the CREBs proceeds can be used to fund a debt service reserve. Thus, the distinction between a debt service reserve fund and an invested sinking fund is particularly important to understand in the case of CREBs.

[7] That is, the maximum "permitted sinking fund yield" (PSFY) is a rate equal to 110% of the long-term adjusted AFR, compounded semi-annually, for the month in which the bond was sold (U.S. Department of the Treasury 2009a). The PSFY is published monthly at https://www.treasurydirect.gov/govt/rates/irs/rates_qtcb.htm and was approximately 5% for April and May of 2009.

This special rule on invested sinking funds is quite favorable to issuers in that it allows them to earn a return on the amounts accumulated in the fund (and these earnings can be used to pay the debt service). Under the normal invested sinking fund rules applicable to tax-exempt bonds (referred to as the "bona fide debt service fund" rules), issuers are not afforded a similar investment opportunity.

Analysis

Investors will only invest in CREBs if they offer a return that is comparable to tax-exempt municipal bonds and the credit risk is reasonable. Because issuers are not required to repay principal until the final maturity date, investors are likely to require the creation of a sinking fund or the pledge of assets as additional collateral.

Tables 2, 3, and 4 compare 16-year "New CREBs" with average tax-exempt bonds (TEB) issued the week of June 15, 2009 when the tax credit rate was 7.59% and the effective rate 5.31% given the 70% credit reduction. This analysis ignores the differences in term, amortization, and liquidity. Table 2 shows that the net benefit after taxes for CREBs is less than tax-exempt bond net benefits, even though the CREBs tax credit rate of 5.31% is higher than certain 20-year tax-exempt rates. If the tax rate is less than 35%, the gap in net benefit is reduced.

Under a scenario such as this, an investor requires supplemental interest payments from the issuer; the interest rate depends on the bondholder's tax rate, the project risk profile, and the issuer's credit rating. If bondholders are assumed to have to pay taxes on the interest income (Benge 2009), an investor with a 35% corporate tax rate might require 2% supplemental interest, which is comparable to estimates from Bank of America, a major CREBs investor (Coughlin 2009). If the municipal bond is rated an investor might require as much as 3% supplemental interest.

Table 3 examines a 35% corporate tax rate and includes the benefits of the tax credit as well as the corporation's ability to deduct interest payments with a tax-exempt bond. This scenario also "nets out" the taxes paid on the tax credit and the interest. At these interest coupons, the net benefits of the "New CREBs" are shown to be approximately the same as tax-exempt bonds, from the standpoint of the investor.

Subsidiaries of companies with lower tax rates may be able to structure bonds such that less supplemental interest is required. For example, if a subsidiary has a tax rate of 20% (as in Table 4), it might be able to offer bonds to AAA-rated borrowers with 0.5% supplemental interest and AA-rated and A-rated borrowers with 1% supplemental interest. In this case, "New CREBs" offer a slight advantage over traditional tax-exempt bonds.

Table 2. Net Benefits of Different Bond Investments under 35% and 20% Corporate Tax Rates

Year 1	“New” CREB (35% Tax Rate)	“New” CREB (20% Tax Rate)	TEB (AAA)	TEB (AA)	TEB (A)
Par Amount	$100,000	$100,000	$100,000	$100,000	$100,000
Tax Credit Rate (70%)	5.31%	5.31%	0.00%	0.00%	0.00%
Interest Rate	0.00%	0.00%	4.85%	5.25%	5.13%
Tax Credit	$5,313	$5,313			
Interest Payment	$0	$0	$4,850	$5,250	$5,130
Tax on Credit	$1,860	$1,063			
Net Benefit (Credit - Taxes)*	$3,453	$4,250	$4,850	$5,250	$5,130

* Net Benefit is the sum of tax credits plus interest payment, minus taxes (on credit and interest).
Sources: Yahoo Finance 2009, Treasury Direct 2009

Table 3. Net Benefits of Different Bond Investments for Companies with a 35% Tax Rate

Year 1	"New" CREB	"New" CREB	TEB (AAA)	TEB (AA)	TEB (A)
Par Amount	$100,000	$100,000	$100,000	$100,000	$100,000
Tax Credit Rate (70%)	5.31%	5.31%	0.00%	0.00%	0.00%
Interest Rate	2.00%	3.00%	4.85%	5.25%	5.13%
Tax Credit	$5,313	$5,313			
Interest Payment	$2,000	$3,000	$4,850	$5,250	$5,130
Tax on Credit	$1,860	$1,860			
Tax on Interest	$700	$1,050			
Net Benefit (Credit - Taxes)	$4,753	$5,403	$4,850	$5,250	$5,130

* Net Benefit is the sum of tax credits plus interest payment, minus taxes (on credit and interest).
Sources: Yahoo Finance 2009, Treasury Direct 2009

Table 4. Net Benefits of Different Bond Investments for Companies with a 20% Tax Rate

Year 1	"New" CREB	"New" CREB	"New" CREB	TEB (AAA)	TEB (AA)	TEB (A)
Par Amount	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
Tax Credit Rate (70%)	5.31%	5.31%	5.31%	0.00%	0.00%	0.00%
Interest Rate	0.50%	1.00%	1.50%	4.85%	5.25%	5.13%
Tax Credit	$5,313	$5,313	$5,313			
Interest Payment	$500	$1,000	$1,500	$4,850	$5,250	$5,130
Tax on Credit	$1,063	$1,063	$1,063			
Tax on Interest	$100	$200	$300			
Net Benefit (Credit - Taxes)*	$4,650	$5,050	$5,450	$4,850	$5,250	$5,130

* Net Benefit is defined the sum of tax credits plus interest payment, minus taxes (on credit and interest).
Sources: Yahoo! Finance (2009), U.S. Department of the Treasury (2009c).

Conclusions

Low-cost municipal debt benefits project developers in the public sector. CREBs, which offer public entities lower cost financing than traditional municipal bonds, may be an attractive option with which to deploy renewables. However, several challenges might make financing with CREBs difficult for public agencies. Deadlines for issuing the bond, reimbursing project costs, and spending all available proceeds are tight. If bonds are not issued within three years, the agency risks forfeiting the allocation. Under new program rules, the issuer also must spend proceeds within three years of issuing the bond. Unspent proceeds must be used for redemption of the outstanding debt. Project developers must heed all deadlines, as extensions are not necessarily easily obtained.

The high cost and complexity of issuing CREB can drive up overall financing costs for projects. Some public agencies (municipal utilities and governments) have cited high transaction costs as a barrier to issuing CREBs. Applying for and issuing CREBs requires considerable up-front legwork. These costs are relatively independent of project size and include the labor required to submit an application and issue the bond, any legal fees, and the costs associated with voter approval (if pursuing a general obligation bond). Furthermore, the new legislation limits non-qualified costs to 2% of the proceeds of the bond, so financing of some transaction costs outside of the bond will likely be required.

State and local governments can overcome these financing challenges. The Commonwealth of Massachusetts, for example, creatively reduced transaction costs and attracted investor interest. Massachusetts' bonding agency, MassDevelopment, issued one bond for 12 bundled projects totaling 1 MW. This approach significantly reduced the cost of issuance and helped attract investor interest with the larger bond size (Cory et al. 2008).

The Energy Act amended CREBs program rules to attract investors and potential issuers. Under the program, public sector renewable energy projects have significant potential to obtain low-cost financing despite the challenges described above.

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