

Leveraging Bond Financing to Support Energy Efficiency and Renewable Energy Goals: A Resource Summary for State and Local Governments

Executive Summary

This resource summary is for state, local, and K-12 energy professionals and non-finance experts seeking to understand how bonds can be used to pay for energy efficiency and renewable energy projects and initiatives. The objective of the resource summary is to inform energy professionals, so they can more confidently and efficiently discuss bond financing with public finance officers and executive leadership as an option for supporting energy goals. The resource summary outlines market trends in bond financing for energy efficiency and renewable energy, reviews the key considerations of bond issuances (e.g., who has bond issuance authority, what are eligible uses of proceeds, what about taxes, and what are the transaction costs?), briefly compares bond financing to other options (e.g., tax-exempt leases and loans), and provides two case studies—one case study of a general obligation bond issuance and one case study of a revenue bond issuance.

Key Takeaways

Nearly every state and territory in the United States has used bonds to support energy efficiency, renewable energy, or environmental infrastructure. Between 2005 and 2017, almost \$30 billion in bonds were issued to support these purposes, with an average issuance size of \$150 million. Smaller issuances of \$1-3 million were also successful, signaling bond financing as a viable option to support smaller projects.

Bonds are often selected as a financing option because they are familiar, offer low borrowing costs, and have longer terms. Bonds offer security (e.g., assurance repayment will occur) and are often structured as tax-exempt (i.e., bondholders do not pay taxes on interest payments), which often translates to lower borrowing costs compared to alternative financing options.

Common barriers to using bonds are identified and solutions are presented to inform non-finance experts about the bond financing process. Key barriers to prepare for include: (1) debt constraints or bond rating concerns that can deter public executives from authorizing additional bonds and (2) high fixed transaction costs that may be difficult to justify relative to the anticipated benefits (e.g., energy cost savings and higher performing buildings).

Bonds are not monolithic—bonds may be structured in a variety of ways to address different barriers. Several different bonding authorities may be able to support a state, local government, or K-12 school energy initiative or project, including

an authority less limited by debt constraints or bond rating. Also, the predictable revenue streams associated with energy efficiency and renewable energy generation (e.g., energy cost savings) can enable more favorable bond structures, and bonding can be used in conjunction with energy savings performance contracting (ESPC).

Current economic conditions in 2020 present both challenges and opportunities for bond financing. The current economic conditions are anticipated to reduce state and local tax revenue¹, making it more challenging for prospective bond issuers (i.e., state and local governments) to maintain good credit ratings and obtain approval to issue bonds. However, bond issuers that are able to maintain good credit ratings can benefit from historically low borrowing costs to finance longer-term projects. *Note: This takeaway is specific to current economic conditions in 2020 and will likely be less applicable in the future.*

The bond issuance process is time- and labor-intensive, and there are numerous specialized considerations that need to be accounted for by state, local, and K-12 leaders that wish to use bond financing to support their energy projects or initiatives; however, bond financing is a well-understood process, is a frequently used financing tool in the public sector, and there are experts well-qualified to facilitate bond issuances. Public-sector energy professionals can use this resource summary to become more familiar with bond financing, so they can be better prepared to engage executive leadership and make more informed decisions about how to pay for energy projects or initiatives.

¹ Center on Budget and Policy Priorities. July 29, 2020. States Grappling With Hit to Tax Collections. See: <https://www.cbpp.org/research/state-budget-and-tax/states-grappling-with-hit-to-tax-collections>.

Introduction

Bond financing is an often-used mechanism for supporting state and local energy efficiency and renewable energy goals. The history of municipal bonds goes back centuries; New York City issued the first recorded U.S. municipal bond in 1812 to fund canal construction.² State and local governments issue bonds to raise large amounts of capital at a comparatively low cost to fund projects with an important public purpose. This resource summary provides a jump-start for decision makers that wish to better understand how and why bond financing can support energy efficiency and renewable energy goals.

Market Size and Opportunity

Municipal bonds (i.e., a bond issued by a public or quasi-public authority) have been issued for energy efficiency, renewable energy, and environmental infrastructure in almost every state in the United States, as well as many territories and the District of Columbia. States with particularly large numbers of issuances include California, Ohio, New York, and Texas.³ Almost \$30 billion in municipal bonds were issued for energy efficiency, renewable energy, or environmental infrastructure purposes across the United States between January 2005 and June 2017, including \$16.5 billion in 2016 alone.⁴ The average issuance size was \$150 million, but numerous smaller issuances of \$1-3 million were also successful. In fiscal year 2012, local governments accounted for 60% of outstanding debt from municipal bond issuances, compared to 40% from state governments.⁵

Key Features of Municipal Bonds

This section reviews who can issue what types of municipal bonds, for what purposes, at what cost, and with what potential preferential tax treatment. It covers some of the key features that impact the borrowing cost to a municipal bond issuer, which include: (1) eligibility for favorable tax treatment; (2) current market interest rates; (3) bond rating; (4) the collateral security and cash flows offered to support repayment of the bonds; and (5) transaction costs.

Authority to Issue

Most state and local governments may issue bonds, provided they have met any applicable state or local requirements to do so; however, only certain issuers may issue tax-exempt municipal bonds. Issuers that may benefit from favorable U.S. federal income tax treatment for their bond issuance include:

- Qualified issuers: States, territories, the District of Columbia, or any possession of the United States and any political subdivision thereof that has one or more of the three “substantial sovereign powers”—taxation, eminent domain, and/or police power⁶;
- Constituted authorities formed under state law to issue bonds for a governmental purpose but that do not have any substantial sovereign powers; and
- Certain conduit entities formed under state nonprofit corporation law whose formation and issuance are approved by action of the governmental unit on whose behalf the bonds are being issued, where the property financed vests in the governmental unit by the end of the bond term⁷ (e.g., 63-20 issuers).⁸

State and local governments interested in issuing bonds to finance energy efficiency or renewable energy projects have a few options: (1) issue bonds directly; (2) form a bonding authority; or (3) vest one or more agencies with bonding authority. While a state or local government may issue bonds directly, it may choose to set up a bonding authority with finance-trained staff familiar with bonds who can specialize in and focus solely on overseeing bond issuances on behalf of various governmental units.

Use of Proceeds

Municipal bonds are typically used for governmental purposes—to finance facilities that will be used by a state or local government and/or the public (such as a city hall, public roads, police cars, or public schools). However, state and local governments may also issue or support the issuance of bonds for private purposes.⁹

² Hennion and Walsh. See: <https://www.hennionandwalsh.com/short-history-municipal-bonds/>.

³ Energy Program Consortium (EPC), The Growing U.S. Green Municipal Bond Market: Labeled, QECBs, CREBs, and Unlabeled. See: <http://www.energyprograms.org/wp-content/uploads/2017/06/greenmunicipalbonds.pdf>. Note that issuances attributed to a state may have been issued by local governments or other qualified issuers and were not necessarily issued by the state government or an agency or instrumentality thereof.

⁴ EPC, The Growing U.S. Green Municipal Bond Market: Labeled, QECBs, CREBs, and Unlabeled. Note that these figures include issuances for purposes other than energy efficiency and renewable energy, including certain water-related projects. See: <http://www.energyprograms.org/wp-content/uploads/2017/06/greenmunicipalbonds.pdf>.

⁵ Tax Policy Center Briefing Book: What Are Municipal Bonds and How Are They Used. See: <https://www.taxpolicycenter.org/briefing-book/what-are-municipal-bonds-and-how-are-they-used>.

⁶ U.S. Treasury Regulation Section 1.103-1.

⁷ Revenue Ruling 63-20 & Revenue Procedure 82-26. 63-20 financing may be compared to certificates of participations (COPs) structures. Robbins/Vander Meulen, An Examination of 63-20 Financing (September 2009 Conference Paper). See: <http://coppfs1.asu.edu/spa/abfm2009/papers/robbins%20vandermeulen%20abfm%20paper%202009.pdf>.

⁸ Many Development Finance Agencies (DFAs) are constituted authorities (e.g., 63-20 issuers), and may also be authorized to issue other types of bonds that might be used for energy efficiency and renewable energy projects. For more information on and links to DFA bond issuers, see: <https://www.cdfa.net/cdfa/cdfaweb.nsf/pages/df.html>.

⁹ Municipal bonds issued for nongovernmental or private purposes or uses may nonetheless be eligible for favorable U.S. federal income tax treatment if they are “qualified private activity bonds” under the U.S. Internal Revenue Code and Regulations and have state authorization. Unlike some other municipal bonds, private activity bonds (PABs) can be issued on a conduit basis—the full faith and credit of the issuer is typically not pledged and the credit rating of the underlying government is not subject to downgrade due to nonpayment of the PABs. Industrial development bonds (IDBs), 501(c)(3) bonds, solid waste bonds, and tax increment finance (TIF) bonds are some examples of tax-exempt bonds that may be issued on a conduit basis to assist manufacturers (IDBs), district energy (TIF bonds) and waste-to-energy project developers (solid waste bonds), nonprofits (501(c)(3) bonds), and homeowners and businesses (TIF bonds used for property assessed clean energy, or PACE); however, state and/or local laws may limit would-be issuers from lending governmental credit to private entities. Potential issuers should consult a qualified and experienced bond attorney to assist in making this determination.

Private purposes include financing facilities:

- That will be used for a person or entity in a trade or business, a nonprofit organization, or the federal government;
- For which the source of repayment is derived or secured directly or indirectly by a private source of payment or security (such as rent from the bond-financed property);
- The proceeds of which are loaned to nongovernmental persons (including individuals not acting in a trade or business capacity).

Municipal bonds used for such private purposes must meet additional detailed legal requirements to be eligible for tax exemption as qualified private activity bonds (PABs) or similar instruments.

Bonds can be used to support one-off projects or to capitalize programs and are used in conjunction with ESPC.¹⁰ In fact, at least one U.S. rating agency, DBRS, has an ESPC bond-specific section in its ratings methodology guide.¹¹

Favorable Tax Treatment and Market Environment

When a municipal bond issuer pays interest on tax-exempt bonds to bondholders, bondholders expect that they will not have to pay U.S. federal income tax on the amounts so received and that the interest may be exempt from state and local income tax as well.¹² Bondholders will accept a lower interest rate on tax-exempt bonds than they would for otherwise similar taxable issuances, meaning issuers pay less than they would otherwise be required to pay. The attractiveness of tax-exempt status fluctuates depending on the tax and market interest rate environment. For example, a low tax and low interest rate market makes tax-exempt bonds, in general, less competitive with alternative forms of non-tax-exempt financing.

Security

Bonds can be categorized based on what assets or cash flows the issuer offers bond purchasers to backstop the issuer's ability to meet its payment obligations on the bond. This is referred to as the "security" on the bonds. In the municipal context, bonds are typically either revenue bonds or general obligation (GO) bonds. Revenue bonds are backed by the revenues generated by a facility, system, or enterprise.¹³ For example, cost savings from an ESPC project can be pledged to pay off a bond.¹⁴ GO

bonds are backed by the issuer's full faith and credit, supported by the issuer's ability to levy and collect taxes, and generally require voter approval.¹⁵ Many jurisdictions are subject to "debt limits" that cap the amount of bonds they can issue and may be more restrictive of GO bond issuances than revenue bond issuances. Energy efficiency and renewable energy projects often generate revenue and may be suitable for financing through either general obligation or revenue bonds. Suitability for revenue bond financing is a special feature of energy efficiency and renewable energy projects that differentiates them from other public projects that do not produce a predictable, quantifiable revenue stream (e.g., new community playgrounds). Last, due to the reliable revenue stream of energy projects, revenue bond-financed projects have continued relevance even when state and local tax revenues may be less robust as result of economic disruption.

Ratings

Bonds can be issued with a rating by one or more rating agencies or without a rating, typically through a private placement, depending on size and credit characteristics. For example, an issuer may choose not to pursue a rating for a small bond issuance (e.g., under \$2 million) because the bond purchaser in a private placement will likely still complete their own internal underwriting, and the additional (relatively fixed) cost of a full bond rating is more challenging to absorb on a smaller issuance. Bonds that receive higher ratings from reputable rating agencies typically pay lower interest costs. In addition, institutional municipal bond investors and funds typically have minimum ratings requirements (e.g., they may require bonds to be A-rated).

When rating a general obligation bond, rating agencies may consider: (1) the amount of debt of the issuer; (2) the amount by which such debt will be increased by the proposed issuance; (3) the state or local valuation, tax levy, and taxes receivable; (4) the population trends and the economic outlook for the community; and (5) any litigation that may affect an issuer's ability to pay the debt service on its bonds and any analysis with respect thereto.

The rating agencies have specific criteria for rating each type of revenue bond, as the risk factors depend on the type of project being financed. For example, the existence of a performance guarantee may impact the rating analysis in an ESPC issuance, as the rating agency may consider the extent to which the guarantee reduces the risk on the bond in question, depending on the nature of the guarantee and the creditworthiness of the guarantor.

¹⁰ For example, see case study from Douglas County School District in Nevada: <https://www.energy.gov/sites/prod/files/2014/06/f16/lbnl-6133e-nv.pdf>.

¹¹ DBRS ABS Ratings Methodology. See: <https://www.dbrs.com/research/333380/rating-us-structured-finance-transactions>.

¹² For example, the Tax Policy Center reports that in 2007, a high-grade taxable municipal bond yielded 1.2% more than a similar tax-exempt issuance (5.6% compared to 4.4%). A taxpayer with a 21% effective tax rate would receive the same after-tax yield from either bond because 21% of 5.6% is 1.2%. Note: While state and local governments typically exempt interest on bonds issued by the taxpayer's state of residence, states may tax interest on bonds issued by other jurisdictions. See U.S. Supreme Court decision in *Department of Revenue of Ky. v. Davis*, 553 U.S. 328 (2008).

¹³ While revenue bonds are structured to provide limited revenues pledged for repayment of the bonds, they may carry a "moral" obligation, particularly if the issuer is a governmental entity (rather than a special purpose entity), as a default of the bonds could impact the governmental entity's ability to access bond markets in the future.

¹⁴ U.S. Department of Energy (DOE), Energy Savings Performance Contracting Toolkit. See: <https://betterbuildingssolutioncenter.energy.gov/espc/financing-options>.

¹⁵ GO bonds can be further subdivided into unlimited tax and limited tax GO bonds. Unlimited tax GO bonds are backed by the total taxing power of the issuer. The issuer can often use property taxes, sales taxes, special taxes, and other sources of income to repay the bonds, as well as the interest owed to investors. Limited tax GO bonds are backed by a specific, narrow taxing power. For example, a town might pass a bond to build a bridge and agree to a \$0.01 increase in sales tax for every \$1.00 increase in sales tax for every \$1.00 generated within the city limits for five years to pay for the debt. See: <https://www.thebalance.com/general-obligation-vs-revenue-municipal-bonds-357926>.

However, revenue bond issuers may be required to provide audited and unaudited financial statements going back several years and on an ongoing basis, evidence of approval of the project by the public utilities or public service commission if required, and evidence that the ratio of project or system revenues to the sum of amounts owed on the bonds will equal or exceed a specified number. Such issuers must typically agree to limit the issuance of additional bonds to pay for project costs, to maintain rates or fees at levels needed to ensure sufficient revenues to pay the amounts due on the bonds, and to maintain certain reserve funds.

Transaction Costs

All bond issuances involve transaction costs, including “costs of issuance,” but the amount and nature of these costs depends on the type and structure of the issuance and how it will be marketed and sold to bond purchasers.¹⁶ Transaction costs can generally be financed from bond proceeds or may be funded from proceeds contributed by the issuer (including for the purpose of protecting the tax-exempt status of the bonds, which may be lost if excess issue costs are claimed).¹⁷ The three most common types of transaction costs in a bond issuance include fees associated with placing and/or underwriting, bond counsel, and financial advisors. There are other fees, as well as variations on the three common types of transaction costs listed previously. See Table 1

for a summary of bond issuance participants, some of which may contribute to transaction costs of a bond issuance.

Bond issuance costs are typically relatively fixed, resulting in greater cost-effectiveness of bonds when used for larger dollar amount projects that can achieve economies of scale.¹⁸ Similarly, financing an energy efficiency or renewable energy project as part of a larger pooled issuance can reduce the transaction cost per dollar of energy efficiency or renewable energy work financed (for pooled bond example, see the Vermont Municipal Bond Bank case study below). However, if financed through a stand-alone bond issuance, bond buyers typically require the same due diligence (e.g., engineering work, savings guarantees, underwriting, and so on) for individual projects in a pooled issuance as they would for each underlying project. In turn, pooled bonds can often achieve economies of scale when the individual projects in the pool are very similar to one another in terms of underlying structures, documentation, and parties.

Transaction costs are typically no more than 2% of bond proceeds,¹⁹ but may run 3% or more for smaller issuances or less than 1% for larger issuances.²⁰ For example, between 2009-2011 among local agencies in California, the median bond issuance in the \$10 million or less par value category paid \$50,000 to underwriters (1%), \$63,675 financial advisor fee (1.18%), and \$47,500 legal fee (.917%).²¹



¹⁶ The Municipal Securities Rulemaking Board’s 2018 publication “Roles and Responsibilities: The Financing Team in an Initial Municipal Bond Offering,” explaining who is involved in a public issuance (competitive bid or negotiated sale to underwriter or otherwise). See: <http://msrb.org/msrb1/pdfs/Financing-Team.pdf>.

¹⁷ U.S. Internal Revenue Code Sec. 147 & Treas. Reg. Sec. 1.150-1; PLR 200813022. Transaction costs considered “issue costs” for U.S. federal income tax purposes may include the following to the extent incurred in connection with, and allocable to, the borrowing: underwriters’ spread (including to the extent paid via sale of bonds at a discount to the face value to the underwriters, who expect to sell the bonds to the ultimate purchasers at a higher price), counsel fees, financial advisor fees, rating agency fees, trustee fees, paying agent and certifying and authenticating agent fees, accountant fees, printing costs, costs incurred in connection with the required public approval process, costs of engineering, and feasibility studies.

¹⁸ For example, California Debt and Investment Advisory Commission (CDIAC) publication No. 12-08 (California Local Agency General Obligation Bond Cost of Issuance 2009-2011), which reviewed 478 CA local agency GO bonds issued between 2009 and 2011 and found an inverse relationship between bond par value and transaction costs as a percentage of par value. In other words, the transaction costs (as a percentage of the face amount of bonds being issued) decrease as the bond par value increases. See: <https://www.treasurer.ca.gov/cdiac/publications/issuance.pdf>.

¹⁹ For example, EPC, Qualified Energy Conservation Bonds (QECCB) Paper, which contains of survey of issue costs on those bond issuances. See: <http://www.energyprograms.org/2017/05/qecb-papers/>.

²⁰ For example, CDIAC Publication No. 12-08, which found that issuance costs on bond issuances of less than \$10 million often constituted around 3% [of bond par value] while those on issuances of \$75 million or more constituted only .74%.

²¹ CDIAC Publication No. 12-08 Figure 3.

Table 1. Municipal Bond Team Roles and Responsibilities

Role	Responsibilities
State or Local Government	Identifies financing need; passes resolution approving issuance (if required); procures needed services (e.g., contractor, engineer, bond counsel, municipal advisor, and so on).
Taxpayers	Vote whether to approve issuance (if required); pay taxes that support government's ability to issue (and pay interest on) bonds (pertains only to GO bonds).
Ultimate Obligor	Repays principal and interest on the bonds. <i>Note: The ultimate obligor may be the bond issuer or the conduit beneficiary.</i>
Bond Authority	Facilitates issuance; aggregates bonds for pooled issuances; provides technical assistance.
Bond Counsel	Advises on legal and tax issues related to issuance; provides opinion as to interest tax exemption.
Securities/Disclosure Counsel	Advises on securities and other legal matters involved in public offering documents for bonds that will be marketed broadly and are required to be registered as a public offering with the Securities and Exchange Commission (SEC).
Contractor	Completes the financed construction or improvements.
Engineer	Assists in planning work to be financed and oversees contractor's progress; provides opinion as to satisfactory completion; may certify energy savings/guarantee if applicable.
Savings Guarantor	Pays the guarantee beneficiary if actual savings are less than guaranteed.
Placement Agent	Finds a buyer for the bonds in a timely manner; places the bonds at the lowest financing cost to the issuer feasible in the time period.
Underwriter	Assists in structuring and pricing the transaction; may agree to buy a certain portion or all of the offering if unable to sell and/or place the bonds at an agreed-upon price.
Bond Insurer	Provides additional security that can increase a bond's credit rating and decrease the interest cost by more than the cost of the insurance ²² ; "wraps" the issuance with a guarantee of payment of the debt service in the event that the issuer is unable to make good on its obligations.
Energy Savings Guarantee Provider	Makes payments in the event that some or all of a specified level of savings is not achieved (i.e., energy performance guarantee). <i>Note: This is only if the bond is being used to finance improvements that are expected to reduce energy costs.</i>
Municipal Advisor (SEC-Registered Financial Advisor)	Advises the issuer as to the various options, structures, and partners; assists in reviewing documents, negotiating terms, and making decisions.
Bond Trustee	Ensures bond issuer compliance with its contractual obligations to the bondholders.
Payment Agent	Ensures orderly payment of principal and interest on the bonds.
Escrow Agent	Holds required reserve funds.
Printers	Print the offering statement and/or other official materials for the bonds (to the extent required and not supplanted by electronic documentation and publication).

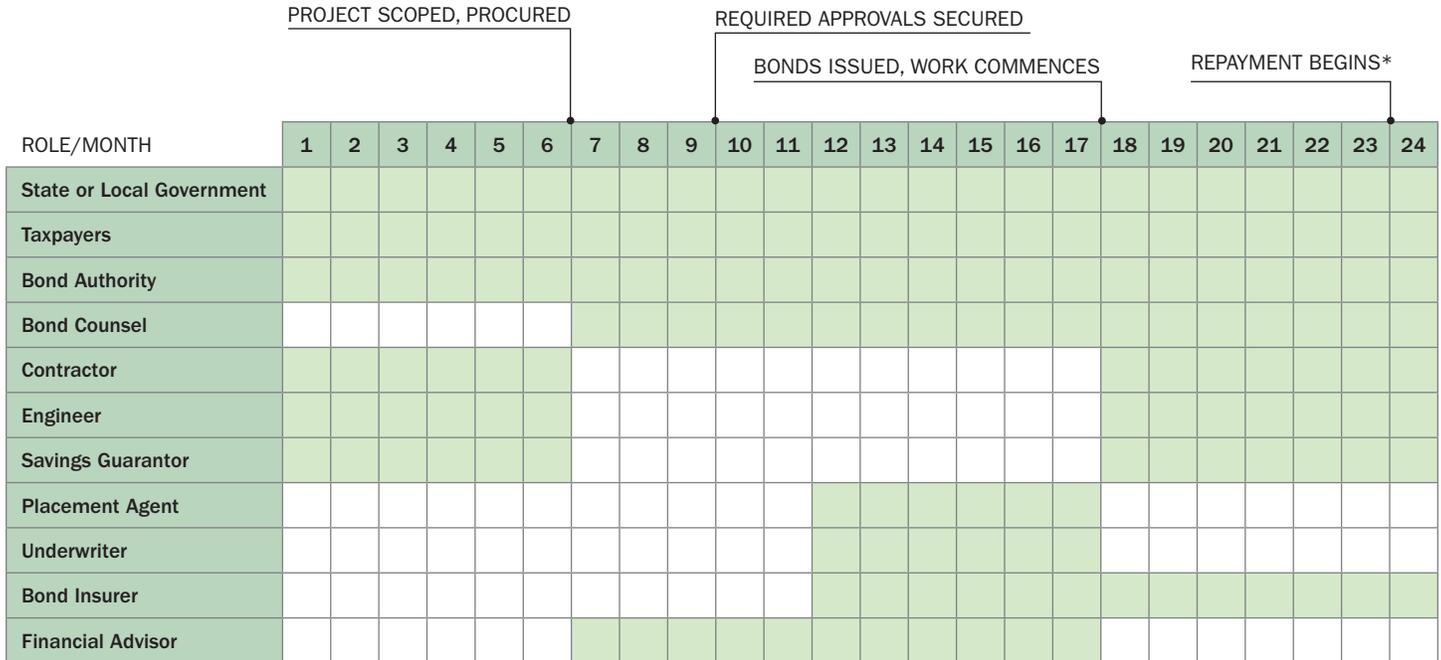
Note: Not all roles may be used or desired in a bond issuance.

²² Benchmark yields on five-year general obligation bonds show that a single-A rated bond is priced to yield 3.76%, or 29 basis points more than an uninsured triple-A rated bond yielding 3.47%. Because more than half of the new municipal bonds issued now come to market rated triple-A with bond insurance, there are fewer bonds that continue to show an outstanding underlying rating. See: http://www.piperjaffray.com/pdf/02-1605_creditratingrole.pdf.

Bond Issuance Process and Timeline

The bond issuance process and timeline varies significantly depending on the circumstances relevant to the issuance. See Figure 1 for a “best-case” municipal bond issuance timeline. For a more concrete example, note the timeline indicated for

the Vermont projects financed by the bond described in the case study below. In each case, as noted in the cited news articles, the need for the improvements financed was known for years prior to successful bond issuance; however, faster timelines are possible if public opinion and finances permit.



*Assumes a typical semi-annual bond repayment schedule. ■ Cells filled in light green indicate an active role for actor during that period.

Figure 1. Municipal Bond Financing Process Timeline and Actors: Best Case

Comparing Financing Options

State and local governments have options to consider when supporting energy efficiency and renewable energy projects and programs and their financing. For example, a project or program might be paid for through bonds (i.e., GO or revenue), loans, tax-exempt leasing (i.e., 63-20 or COP), or if resources permit, with existing cash. Key considerations when comparing these financing options include debt treatment, risks to public funds, suitability to project size, transaction costs, term length, and overall complexity.²³

One key difference between GO and revenue bonds is the risk each poses in the event of default (i.e., when a public entity is unable to make payments to bondholders). In the event of default on a GO bond, public entities risk the seizure of public funds or

a requirement to raise taxes to pay bondholders. With revenue bonds, on the other hand, bondholders can seize the revenues from a project or the assets associated with the project, but do not have the authority to access public funds or mandate an increase in taxes as a means to pay bondholders. The risks associated with default on a GO bond are a significant barrier for state and local leaders. Revenue bonds, which are a viable option for energy projects, do not pose the same level of risk to public funds or taxpayers. Unlike GO bonds, energy projects backed by revenue bonds will typically require an upfront, robust demonstration of anticipated project revenue from efficiency improvements (e.g., an investment grade audit) or a renewable energy project (e.g., an engineering-grade feasibility analysis).

²³ Credit rating impacts should be considered as well; however, all financing approaches can impact credit ratings—although bonds, which are closely monitored by ratings agencies, often impact credit ratings more immediately and with greater magnitude relative to other approaches (e.g., tax-exempt leasing, using cash on hand).

Table 2 provides a simplified introductory summary of considerations as compared across different financing approaches, but experiences can vary significantly depending

on particular circumstances. Each potential issuer must consult qualified attorneys and professional advisors to evaluate and determine their best course of action.

Table 2. Bond Financing and Alternative Mechanisms for Public Facility Energy Efficiency and Renewable Energy Improvements: A Side-by-Side Comparison

	General Obligation (GO) Bond	Revenue Bond	Loans	Tax-Exempt Leasing ²⁴ (63-20 or COP) ²⁵	Paying with Cash-on-Hand
Treated as Governmental Debt	Yes	Yes, frequently if issued by government directly ²⁶	Yes	Depends on state and local law and interpretation under accounting standards ²⁷	No
Risk of Increased Taxes in Event of Project Default	Yes	No	No	No	No
Typical Project Size (\$)	Medium to Large (\$2M+)	Medium to Large (\$2M+)	All	Small to Medium (up to \$2M)	Typically Small; limited by amount of cash on hand and competing needs for its utilization
Transaction Costs	Low to Medium (1%-3% depending on project size)	Medium to High (2%-4% depending on project size)	Low (1% depending on project size)	Medium to High (2%-4% depending on project size)	Lowest (<1% depending on project size)
Close Time	Longest (several months)	Long (months)	Short to Medium (days to weeks)	Short to Medium (days to weeks, assuming preexisting issuer)	Shortest (days)
Maximum Term/Tenor	Longest (30+ years)	Long (20-30 years)	Short to Medium (20 years or less)	Long (20-30 years)	N/A
Complexity	Low	Medium	Lower	Medium	Lowest

²⁴ These types of obligations are typically subject to nonappropriation clauses: if the appropriation is not made, the obligee cannot pay debt service. As a result, these obligations typically involve higher interest rates even if payable from tax revenues.

²⁵ In municipal lease financing, the government, rather than vendor, floats the debt directly (certificates of participation) or creates a conduit—a nonprofit corporation—to float the debt (e.g., 63-20 financing). In both instances, the government leases back the project for the duration of the debt. Although 63-20 bonds are tax-exempt, the debt is not subject to the legal debt limits of the public agency, nor is it measured as a long-term liability. Rather, because the public agency leases the project from the nonprofit corporation, the lease payments are calculated under current liabilities. In addition, the debt does not have to be approved by referendum or state legislature. The nonprofit issuer may not be subject to public works and procurement laws and may have more flexibility around hiring the workers needed to get the project finished and to maintain and operate it over the lease term. For more on tax-exempt leasing, see: <http://www.clpusa.net/faq/what-is-a-municipal-or-tax-exempt-lease> and <http://www.clpusa.net/lease-purchase-financing/what-is-it>.

²⁶ Washington State is an exception. “Under current statutes, only GO debt counts against a jurisdiction’s debt capacity.” See: <https://www.commerce.wa.gov/about-us/research-services/bond-users-clearinghouse/local-debt-limitations-primer/>. Additionally, many state and local governments partner with conduit bond authorities (e.g., quasi-public authorities or authorities that are instruments of the state) to issue revenue bonds without treatment as public debt.

²⁷ FASB Accounting Standards Update, see: https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1176167901010&acceptedDisclaimer=true. As of January 2019, the FASB (Financial Accounting Standards Board) issued an update to improve transparency and comparability among organizations. Companies and organizations are now required to record lease assets and lease liabilities on the balance sheet. FASB and the International Accounting Standards Board (IASB) efforts to improve financial reporting resulted in an amendment to the FASB Accounting Standards Codification and creating Topic 842, Leases.

Case Study: Vermont Municipal Bond Bank, General Obligation Bonds

Issuer: Vermont Municipal Bond Bank, an authority of the State of Vermont.

Purpose of Bond Issuance Proceeds: Used to complete efficiency upgrades on K-12 school district facilities and develop a new net zero emission police and fire facility for a town.

Background: The Vermont Municipal Bond Bank (the Bank) is an authority of the State of Vermont that issues bonds and uses the proceeds to purchase bonds issued by local governments within the state. Local governments first submit an approved application to the Bank and enter into a loan agreement with the Bank prior to the Bank's purchase of local government bonds.²⁸

In March 2017, the Bank issued \$6.1 million in labeled green general obligation bonds as part of a larger, pooled \$38 million general obligation bond issuance, enabling green-focused investors to target their investment dollars to projects aligned with their investment objectives. The bond issuance supported the following two projects:

- (1) The Bennington School District, as part of an ESPC project, invested \$4.5 million in higher efficiency boilers, heating control systems, water heating, energy recovery ventilators, windows, insulation, and LED lighting²⁹; and
- (2) The Town of Norwich invested \$1.4 million to develop a net zero emissions fire and police facility that did not rely on natural gas, fuel oil, or propane and incorporated solar electricity.³⁰

Conclusion

Bond financing is an important, common, and time-tested mechanism for supporting state, local, and K-12 energy efficiency and renewable energy goals. This resource summary presents public-sector energy professionals with key considerations for using bond financing to support energy projects or initiatives so they can have informed discussions with their public-sector leadership. Energy professionals can use this resource summary to understand key bond financing terms and processes, reference resources, and case studies to be more informed and prepared when considering bonds as a financing option for achieving energy efficiency and renewable energy goals. In particular, energy professionals should note the variable ways in which bonds can be issued and structured to address key barriers (e.g., debt constraints and high fixed costs) and seek out partnerships and expertise to navigate the bond issuance process.

²⁸ 2017 Financial Statements, see: <http://www.vmbb.org/wp-content/uploads/VMBB-fs-17-final.pdf>. State legislation established the Bank in 1970 as an instrumentality of the State of Vermont exercising public and essential governmental functions. As such, the Bank falls under the second category of qualified issuers described in "Key Features of Municipal Bonds" of this resource, or those entities referred to as "constituted authorities."

²⁹ The need for improvements in the schools was documented years prior to the issuance. For example, see: <http://benningtonvt.org/wp-content/uploads/2012/11/BenningtonMunicipalEnergyPlan2012.pdf>. For examples of the challenges potential issuers may face, see: <https://www.manchesterjournal.com/stories/bennington-agency-of-ed-puts-bennington-school-districts-energy-retrofit-on-hold,9895> (2016); <https://www.benningtonbanner.com/stories/bennington-school-districts-energy-improvement-project-delayed,116356> (2016).

³⁰ For coverage of the progress of the issuance, from voter approval to construction process, see: <http://digital.vpr.net/post/norwich-voters-will-decide-whether-replace-outmoded-police-and-fire-stations#stream/0> (2015) and <https://www.vnews.com/Norwich-Fire-Police-Renovations-Begin-10849375> (2017).

³¹ An independent third party (First Environment) reviewed the bonds and certified that they are aligned with the green bond principles created and maintained by the International Capital Markets Association.

³² NYSERDA's Tier 2 underwriting criteria enables access to financing for customers who may not have access via traditional underwriting criteria. For GJGNY loan performance information, see: <https://www.nyserda.ny.gov/Researchers-and-Policymakers/Green-Jobs-Green-New-York/Data-and-Trends>. This is NYSERDA's second rated direct issuance and sixth issuance to fund GJGNY. Prior issuances were executed with support from the Clean Water State Revolving Fund. The bonds are non-recourse and are not guaranteed by NYSERDA.

Case Study: New York State Energy Research and Development Authority, Green Revenue Bonds

Issuer: New York State Energy Research and Development Authority (NYSERDA), an authority of the State of New York.

Purpose of Bond Issuance Proceeds: Used to fund NYSERDA's Green Jobs Green New York (GJGNY) program, which offers single-family homeowner loans to pay for residential energy efficiency improvements and solar installations.

Background: In March 2019, NYSERDA issued \$15.5 million in A-rated Green Revenue Bonds.³¹ The bonds were backed by a pledge of loan assets (i.e., loans in repayment by homeowners) originated through the GJGNY program. In other words, the source of repayment to the bondholders (i.e., the "revenue" underlying the revenue bond) is the principal and interest payments made by homeowners on their loans to NYSERDA.

The pledged loan assets took two different forms including: (1) loans for which payment is collected by the homeowner's utility on their utility bill ("on-bill" loans, about 32% of the pool); and (2) loans originated via NYSERDA's Tier 2 underwriting criteria (remaining 68%).³² Approximately 66% of the underlying GJGNY loans supported energy efficiency improvements while about 34% supported solar installations. As of the date of issuance, outstanding GJGNY bond issuances totaled over \$120 million.

Resources

Learn more about bond financing through the following resources:

U.S. Department of Energy’s (DOE’s) State and Local Solution Center: Bonding Tools—Learn more at: <https://www.energy.gov/eere/slsc/bonding-tools>.

Case Study: Douglas County School District in Nevada—Lawrence Berkeley National Laboratory (2014). Learn more at: <https://www.energy.gov/sites/prod/files/2014/06/f16/lbnl-6133e-nv.pdf>.

Case Study: Oxford Area Community School District in Michigan—Lawrence Berkeley National Laboratory (2014). Learn more at: <https://www.energy.gov/sites/prod/files/2014/06/f16/lbnl-6133e-mi.pdf>.

Report: The Growing U.S. Green Municipal Bond Market: Labeled, QECBs, CREBs, and Unlabeled—Energy Programs Consortium (2017). Learn more at: <http://www.energyprograms.org/programs/green-bonds/>.

Tools: Energy Savings Performance Contracting Financing Decision Tree—DOE (2017). Learn more at: <https://betterbuildingssolutioncenter.energy.gov/espc/financing-decision-tree>.

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For more information, visit: [Energy.gov/eere/slsc](https://www.energy.gov/eere/slsc)

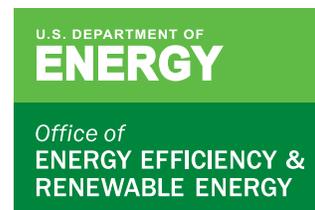
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Questions? Contact stateandlocal@ee.doe.gov



For more information, visit:
[energy.gov/eere/slsc](https://www.energy.gov/eere/slsc)

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