

QUALIFIED ENERGY CONSERVATION BONDS (QECBS)



August 2016



Nothing contained in this issue paper should be construed or relied upon as legal advice. Instead, this issue paper is intended as a general introduction to the subject of the use of qualified energy conservation bonds to finance energy and mass transit projects, from which better informed requests for advice can be formulated.

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About Energy Programs Consortium (EPC)

The purpose of the Energy Programs Consortium (EPC) is to foster coordination and cooperation among state and federal agencies in the areas of energy policy and program development. EPC is a joint venture of the National Association of State Community Services Programs (NASCS), representing the state weatherization and community service programs directors; the National Association of State Energy Officials (NASEO), representing the state energy policy directors; the National Association of State Regulatory Utility Commissioners (NARUC), representing the state public service commissioners; and the National Energy Assistance Directors' Association (NEADA), representing the state directors of the Low Income Home Energy Assistance Program.

EPC provides technical assistance to state, local and federal officials to develop energy efficiency, water conservation, transportation, resilience and renewable finance programs. We examine options for states to issue tax credit bonds to support the financing of energy projects. We coordinate efforts with NASEO, the U.S. Department of Energy (DOE), the National Renewable Energy Laboratory (NREL) and Lawrence Berkeley National Laboratory (LBNL) to provide model documents and other QECB resources.¹

If you are a state or local official exploring your options for energy program financing, EPC and NASEO can offer assistance by sharing others' experiences, putting you in touch with issuers who may have dealt with similar issues, and providing comments and feedback. Conversely, if you have any experiences to share, we would very much like to hear from you so that other state and local governments may benefit from your work.

If you would like more information or if you have information on your state to feature, please contact Elizabeth Bellis at ebellis@energyprograms.org.

Acknowledgments

This paper is an update to and expansion of EPC's periodic QECB Paper, last issued October 2015. I would like to thank Assistant Director of Finance Programs Susan Rosenthal for assisting with the updates to this paper. I would also like to thank Rebekah King, Sarah Sieting Alim and Gabriel Weil, former staffers with EPC, for their many hours of phone calls, emailing, and tireless number crunching for prior versions of this paper, without which this paper would not be possible. It also would not be possible without the input of countless state and local energy officials, attorneys, bankers and contractors across the country. Thank you for sharing your experiences. We look forward to hearing from you.

I also need to thank the Surdna Foundation for their continuing support of this endeavor. Without their support the completion of this paper and the periodic updates to it would not be possible. In addition, I would like to thank the Energy Foundation whose initial support enabled me to develop this project.

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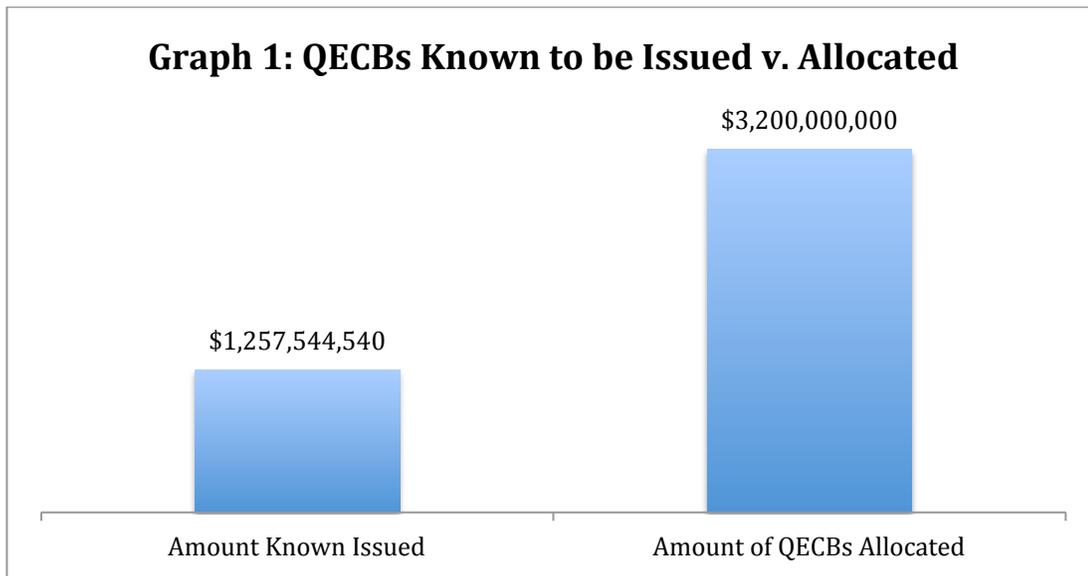
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¹ The NASEO QECB resource page (<http://www.naseo.org/financing-resources-qecb>) contains helpful documents, including examples of authorizing orders, legislation and bond documentation. The DOE QECB resource page is found here: <http://energy.gov/eere/slsc/qualified-energy-conservation-bonds>

I. INTRODUCTION

Qualified Energy Conservation Bonds (QECBs) were authorized by Congress in the 2008 Energy Improvement and Extension Act. The original legislation authorized just \$800 million of QECBs nationwide. In the American Recovery and Reinvestment Act of 2009 (“ARRA”), Congress increased to \$3.2 billion the funding for states, territories, large local governments, and tribal governments to issue QECBs to finance renewable energy and energy efficiency projects. The total allocation was divided among the state and territorial issuers according to population, as shown in Table 1A.

At least 229 projects, totaling just over \$1 billion, have been funded to date. Projects have been financed with QECBs in at least 37 states. Some states, such as Kansas, Kentucky and Nebraska have exhausted or nearly exhausted their allocations (with Colorado, Nebraska, Montana, California, Alabama and Louisiana close behind)², while up to 14³ states have yet to use any portion of their allocation. Approximately 39% of the \$3.2 billion in allocations are now known to have been issued.



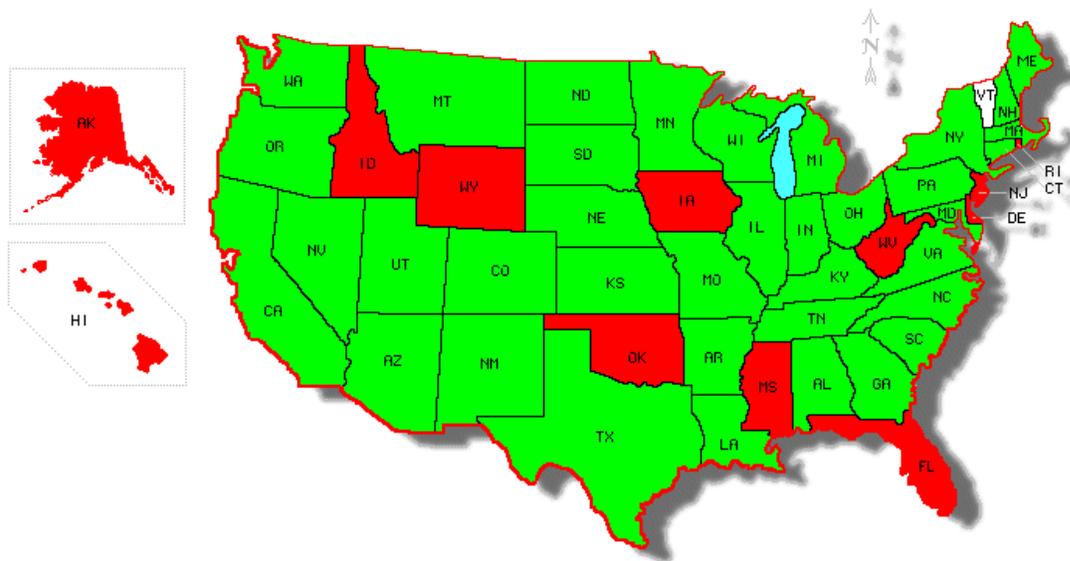
² As of August 2016, percentages in these states are: Kansas, 99.98%; Kentucky, 99.79%; Nebraska 98.37%, Colorado, 96.38%; Montana, 83.03%; California, 82.31%; Louisiana 82.65% and Alabama 81.31%;

³ States not yet known to have issued are: Alaska, Delaware, District of Columbia, Florida, Hawaii, Idaho, Iowa, Mississippi, New Jersey, Oklahoma, Rhode Island, Vermont, West Virginia, and Wyoming. The five U.S. territories that received allocations (American Samoa, Guam, Northern Marianas, Puerto Rico and US Virgin Islands) are also not known to have issued.

Figure 1: State Issuances of QECBs

QECB map

- - Issued QECBs
- - No QECBs issued



Source: diymaps.net (c)

QECBs are among many federal programs that have experienced sequestration cuts. See Section V. Under current federal law, however, the authority to issue these bonds does not sunset.

II. QUALIFIED ENERGY CONSERVATION BOND PROCESS AND MECHANICS

As described above, the U.S. Congress allocated QECB volume to the states⁴ and territories and indicated that the states “shall” suballocate a portion of these allocations to large local governments and municipalities (those with a population of 100,000 or more).⁵ These counties, municipalities or tribes may issue bonds up to the amount of their respective suballocations or waive their suballocations and return them to the states. See Appendix I for a list of known suballocations.

A. Qualified Projects

QECBs may only be issued for qualified conservation purposes as defined in section 54D of the U.S. Internal Revenue Code. “Qualified conservation purposes” include capital expenditures:

⁴ As per IRS Notice 2009-29, the term state includes the District of Columbia and any possession of the United States.

⁵ See IRS Notice 2009-29 (state-by-state allocations). Population determined using census data as of July 1, 2007. The suballocation process has not been completed in some states. See Appendices for examples of state authorizing orders (Appendix C: State Executive Orders) and legislation (Appendix B: State QECB Legislation). Local governments often authorize issuances through a resolution or ordinance. See Appendix G: Local Resolutions. With respect to tribes, Notice 2009-29 provides: “Under § 54D(h), an Indian tribal government shall be treated as a large local government, except that (1) an Indian tribal government shall be treated as located within a State to the extent of so much of the population of such government as resides within the State, and (2) any bond issued by an Indian tribal government shall be treated as a qualified energy conservation bond only if issued as part of an issue the available project proceeds of which are used for purposes for which such Indian tribal government could issue bonds to which § 103(a) applies.”

1. To reduce energy consumption in publicly owned buildings by at least 20%
2. To implement green community programs (including the use of grants, loans, or other repayment mechanisms to implement such programs)⁶
3. For rural development (including the production of renewable energy)
4. For certain renewable energy facilities (such as wind, solar, and biomass)⁷
5. For certain mass commuting projects

To ensure that bonds are being used appropriately, QECB issuers should consider requesting an opinion of qualified and experienced bond counsel that the bonds will qualify as QECBs.

In assessing QECB questions, issuers should keep in mind that the IRS/Treasury, and not the Department of Energy, will audit bond issuances for compliance with section 54D. IRS/Treasury is not bound by Department of Energy interpretation of IRS and Treasury rules and regulations. **A working relationship with experienced bond counsel is critical for potential issuers.** For a list of counsel known to have advised on QECB issuances, see Appendix A.

B. Waivers: Returning Large Local Government Sub-Allocations to the State

Types of Waiver Process

Large local governments may return their sub-allocations to the state. States have used different approaches to this process including:

(1) *Affirmative Waiver*: A large local government affirmatively waives its suballocations (generally by an act such as a resolution or motion of the county or city council) or the state does not recognize the waiver.

(2) *Constructive Waiver*: The state requests each large local government to notify the state by a certain date of its intent to utilize its suballocation, with failure to notify being treated as waiver.

See Appendix E for examples of waiver documentation jurisdictions have used.

There are pros and cons to each approach. Affirmative waivers can be difficult to obtain since local governments may be averse to “giving money back” even if there is no readily apparent use for the money at the present. There have also been questions as to what action of local government is necessary to authorize an affirmative waiver and some states have taken the position that their state law requires a full action of the large local government as a body for an affirmative waiver to be valid. Such action is difficult to obtain and therefore also hinders the use of affirmative waivers. This leaves large numbers of QECB allocations effectively stranded at the local government level with no intent to ever issue them.

While constructive waivers are a more effective way of getting the allocations back to the state level for reallocation, some states have questioned the validity of such waivers and the issuances stemming from them. This position is based upon interpretation of specific provisions of relevant state law.

In an attempt to clarify issues surrounding the waiver process, in June 2015 the IRS revised its “Frequently Asked Questions on Tax Credit Bonds and Specified Tax Credit Bonds”.⁸ The updated FAQ states that ***“The IRS will defer to any reasonable process under applicable State law by which a large local government, acting through its governing body or a duly authorized official of a large local government, voluntarily reallocates its volume cap for QECBs back to the State in which such large local government is located.”*** It is still not clear whether this revised language is enough to give comfort to bond counsel in states where there are questions as to the legality of a constructive waiver process as, at the time of writing, we are not aware of any state that has revised its waiver process as a result of this updated language.

⁶ Note: If QECBs are used to provide funding for loans, grants, or other repayment mechanisms related to green community programs, they are not treated as private activity bonds. See 26 USC 54D(e)(4). To operate a green community program as an energy efficiency loan program, the issuing government might partner with a lender that in turn makes loans to homeowners. See Department of Energy Technical Assistance Program, “Taking Advantage of Qualified Energy Conservation Bonds” (September 22, 2010). Alternatively, the issuing government might use QECB proceeds to make loans directly to homeowners. See, for example, St. Louis County Saves, www.stlouiscountysaves.com.

⁷ Other qualified purposes include geothermal, small irrigation power facilities, landfill gas facilities, trash to energy facilities, hydropower facilities, marine & hydrokinetic renewable energy facilities, and research activities, demonstration projects, and public education campaigns. See 26 USC 54D for exact language.

⁸ See Q.38, page 9: https://www.irs.gov/pub/irs-tege/tc_and_stcb_q-a_09-07-10_1.5.pdf

In our research we discovered a number of different approaches to putting waiver processes into place, including (1) simultaneous allocation and waiver authorization through Executive Order; (2) simultaneous allocation and waiver authorization through legislation; and (3) absence of any officially authorized waiver process.

At least thirteen states utilized Executive Orders to implement and authorize the allocation of QECBs.⁹ Of the thirteen, two states, Idaho and Virginia, used an Executive Order to simultaneously authorize allocations and a constructive waiver process. Virginia issued two Executive Orders because the first expired before all of the state’s allocations were utilized. We are not aware of any state that has used an Executive Order solely for the purpose of clawing QECB funds back to the state.

A plurality of states has an affirmative waiver process. 18 states either have no waiver process (or we have not been able to identify the waiver process) or do not provide information on QECBs at all.¹⁰ There are still a few states that have not authorized the QECB funds and therefore have no QECB program in existence.¹¹

Some states (including Nebraska, Tennessee, Texas and Washington) utilized a “Letter of Intent” (LOI) approach that might be properly characterized as either an affirmative or a constructive waiver depending in part on state law (See Appendix E for LOI examples from Texas and Washington.) In these states, the authorized party or agency sent a “Letter of Intent” to each large local government (LLG) asking whether the LLG was going to use its QECB allocation. If the LLG checked “no” on the Letter of Intent the QECB funds were allocated back to the state.

Waiver Process	Number of States
Affirmative ¹²	24
Constructive ¹³	6
Letter of Intent ¹⁴	4
No Waiver Process/Unknown ¹⁵	17

C. QECB Subsidy and Interest Rates

QECBs are similar to Build America Bonds (BABs) in that the interest on QECBs is taxable but the federal government offers a direct cash subsidy to the bond issuer to subsidize the interest costs. The subsidy on QECBs is (unless reduced by sequestration or similar federal action) twice as large as the standard BAB subsidy, making QECBs an extremely low-cost financing option for many issuers.

The QECB subsidy (70% of the Qualified Tax Credit Bond Rate) is generally correlated with Treasury yields and has historically ranged from 2.68% to 3.9%.¹⁶ Up-to-date Qualified Tax Credit Bond Rates (with respect to which QECB subsidies are set) can be found online at Treasury Direct’s website, sponsored by the U.S. Treasury Bureau of the Public Debt (www.treasurydirect.gov/GA-SL/SLGS/selectQTCDDate.htm). According to the Department of Energy Clean Energy Finance Guide, the rate is set so that the present value of principal payments equals 50% of the original principal amount.¹⁷

Issuers can choose to issue taxable bonds with a corresponding tax credit to the holders of the bonds or (as is more commonly done) elect to receive a direct cash payment from Treasury in lieu of the allowance of the tax credit to the

⁹ Confirmed via State Agencies website or employees. See Appendix H for relevant agencies.

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¹¹ See page 11 for discussion of state utilization and authorization.

¹² Alabama, Arizona, Arkansas, Connecticut, Florida, Georgia, Illinois, Iowa, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Missouri, Nevada, New Hampshire, New Jersey, New York, North Carolina, , Oregon, Pennsylvania, Utah, Wisconsin

¹³ California, Colorado, Kansas, Idaho, South Carolina, Virginia

¹⁴ Nebraska, Tennessee, Texas, Washington

¹⁵ Alaska, Delaware, District of Columbia, Hawaii, Indiana, Maryland, Mississippi, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Rhode Island, South Dakota, Vermont, West Virginia, Wyoming

¹⁶ Based on 70% of the QTCR since the date of first QECB issuance (2/2/10) with rates published at: www.treasurydirect.gov/GA-SL/SLGS/selectQTCDDate.htm

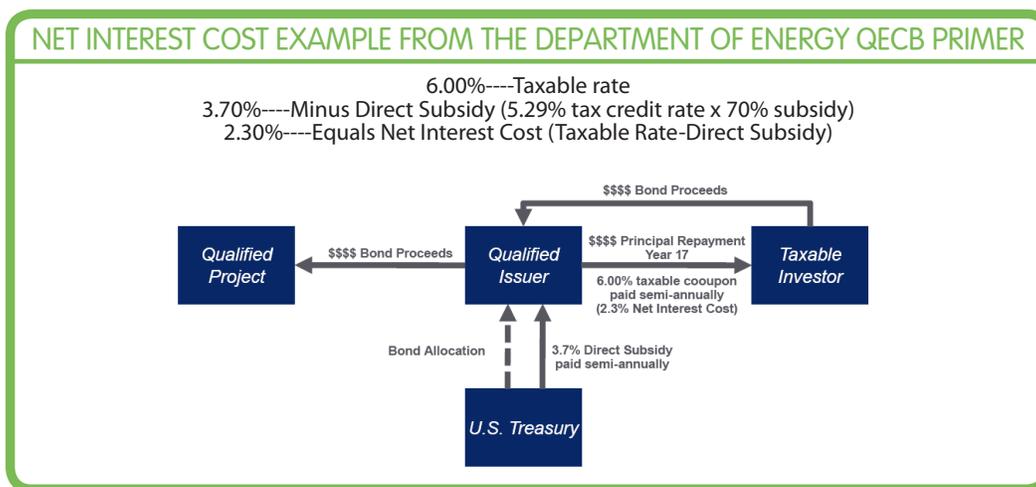
¹⁷ 13 See Chapter 2 in U.S. Department of Energy Clean Energy Finance Guide (December 2010), p. 11,

www4.eere.energy.gov/wip/solutioncenter/finance_guide/content/chapter_documents?print=1.

holders.¹⁸ Tax credit bonds, unlike direct pay bonds, do not appear to be subject to sequestration cuts, but no written guidance confirming this is available as of August 2016.

In the more popular direct-pay QECB, the issuer pays a taxable coupon to the investor and repays principal at the end of the term.¹⁹ Treasury pays the issuer the lesser of the taxable coupon rate or 70% of the tax credit rate.²⁰

Figure 2: How the Subsidy Works



D. Maturity and Repayment Structures

QECBs are fairly long-term financing options. The maximum amount of time the bonds can be outstanding (“maturity”) is set by the government periodically and has historically ranged from 12.5 to 35 years.²¹ Issuers can choose to issue bonds of any maturity *up to* the maximum maturity.

Up-to-date maturity limits can be found online at Treasury Direct’s website, sponsored by the U.S. Treasury Bureau of the Public Debt (www.treasurydirect.gov/GA-SL/SLGS/selectQTCDDate.htm).

E. Call Provisions

QECBs may be issued with one or more “call provisions.” Call provisions give the bond issuer the right to purchase (or “call”) part or all of a bond issue at specified times. Sometimes the bonds must be recalled if certain events occur (“mandatory redemption”); other provisions allow the issuer to decide whether to repurchase the bonds (“optional redemption”). If the issuer may recall the bonds if certain unusual or “extraordinary” events occur, the provision is known as an “extraordinary optional redemption.” In some cases, investors may demand a premium to be paid if the issuer calls the bonds early or before a specified date. The Municipal Securities Rulemaking Board (MSRB) provides a number of examples of redemption provisions that may be of interest to potential issuers.²²

¹⁸ H.R. 2847 Section 301.

¹⁹ In conjunction, the issuer may make level annual payments into a fund known as a “sinking fund,” for payment of principal. Sinking funds are invested at the permitted sinking fund yield established at pricing (not shown in the Department of Energy QECB Primer illustration below). See: U.S. Department of Energy QECB Primer, p. 12, http://www1.eere.energy.gov/wip/pdfs/qecb_creb_primer.pdf.

²⁰ See IRS Notice 2010-35, p. 5

²¹ Wells Fargo Monthly QECB Activity Updates (June 2011-January 2013); www.treasurydirect.gov/GA-SL/SLGS/selectQTCDDate.htm.

²² “Optional redemptions often can be exercised only on or after a specified date, typically beginning approximately ten years after the issue date. Some types of mandatory redemptions occur either on a scheduled basis (made in specified amounts or in amounts then on deposit in the sinking fund) or whenever a specified amount of money is available in the sinking fund (“sinking fund redemptions”). An extraordinary redemption may be triggered by, among other things, bond proceeds remaining unexpended by a specified date (an “unexpended proceeds redemption”), a determination that interest on the bonds is taxable (a “tax call”), a change in use of a project financed with bond proceeds that would cause interest on the bonds to become taxable (a “change in use call”), a failure of the issuer to appropriate funds

In 2015, EPC reviewed the subset of known QECB issuances for which we were able to obtain Official Statements and has identified two call provisions common to this type of bonds: (1) repurchase due to failure to expend proceeds and (2) repurchase due to failure to receive Treasury subsidy payments.

Unexpended Proceeds Provision: These provisions give the issuer the right to redeem the bonds if bond proceeds remain unexpended by a specific date (in this case, generally the date by which they must be used for the bonds to retain eligibility for subsidy payments). Some examples of this type of provision are Allegheny County, Pennsylvania, Itasca County, Minnesota, and Yakima County, Washington.²³ That is, the issuer will repurchase the bonds if proceeds are not spent on qualifying projects within the time required by the Internal Revenue Service (IRS), usually three years under current law. Note that once issued and repurchased, an allocation can not be re-issued for another use and is effectively “lost”. As such, issuers may wish to consider whether their project will be able to expend proceeds within the required time frames.

Revocation of Subsidy Provision. These provisions generally allow for repurchase due to events such as a change in law that results in subsidy revocation and exclude cases in which the revocation is due to the issuer’s action or failure to act. Examples include Alma Center, Wisconsin, Yakima County, Washington, and Itasca County, Minnesota.²⁴

In addition to these more common call provisions, some QECB issuers obtain the right to repurchase the bonds for any reason after a certain number of years. For example, Yakima, Washington, which issued \$2.5 million in QECBs in September 2010, can repurchase its bonds at “par²⁵ plus accrued interest” after 10 years.²⁶

F. Securing QECBs

When a municipality issues QECBs, it promises to make the principal and interest payments on the bond to bondholders. Sometimes an issuer secures its promise with a specific and limited revenue stream (“revenue bonds”) and at other times it secures its promise more broadly as a general obligation backed by the full faith and credit of the issuer (“general obligation bonds”). In some cases, the issuer may offer specific equipment or property as collateral to secure its promise to pay the bondholders. Issuers may also provide for a debt service reserve fund to secure the bonds.

In 2014, EPC was able to identify the apparent bond security for 81 issuances for which Official Statements were publicly available (out of 187 known issuances). Of the 81 issuances for which the type of security were known, 47 (or 58%) appeared to be general obligation issuances.²⁷

G. Nuts and Bolts

- QECB issuances often take several months to structure, market, price, and close.
- Once QECBs are issued, proceeds must be spent (or used to redeem bonds) within three years of issuance. The Secretary of the U.S. Treasury can extend the spending period if it finds reasonable cause to do so, but EPC is not aware of any example of this occurring for any issuance to date.²⁸
- Issuers must also have a binding commitment with a third party to spend at least 10% of the proceeds within six months of issuance.²⁹

needed to pay **debt service** on **lease rental bonds** or **certificates of participation** that are subject to appropriation (an “appropriation or non-appropriation call”) or the destruction of the facilities from which the bonds are payable (a “calamity or catastrophe call”).” Source: <http://www.msrb.org/Glossary/Definition/REDEMPTION-PROVISIONS.aspx>.

²³ See Appendix G: Call Provisions

²⁴ See Appendix G: Call Provisions

²⁵ Par value is the value of a security expressed as a specific dollar amount marked on the face of the security, or the amount of money due at maturity. This is different from face value, which is the value (i.e., principal or maturity value) of a security appearing on the face of the instrument. Face value is also known as principal value. Source:

²⁶ The 2010B Bonds are subject to redemption, at the option of the County as a whole or in part, on any date on or after December 1, 2020 at a price of par plus accrued interest to the date of redemption. Yakima County, Washington Official Statement Dated September 22, 2010 for Series 2010 B QECBs Due June 1, 2027, p. 10.

²⁷ General obligation issuances include: Champaign County (2), Waterbury City, King County, Yakima County, Washington County Housing and Redevelopment Authority, Deerfield, Louisville-Jefferson County, Grant County, Itasca County, Fayette County, York County, Mount Horeb School District, Osseo Fairchild School District, Hartford No. 1 School District, Western Wisconsin Technical College (3), Jefferson School District, Alma-Hunter-Merrillan School District, Wyandotte County, State of Maryland, Belchertown, Lowell, ELY School District, Rochester City, Mandan School District, Allegheny County, Davison County, Menasha School District, Pleasant Prairie Village, Billings School District, Billings School District High School, Nashville and Davidson County, Thurston County, Rapid City, Spotsylvania County, and Goodhue County.

²⁸ See 26 USC 54A(d)(2)(a); see also IRS Notice 2010-35, available at www.irs.gov/pub/irs-drop/n-10-35.pdf.

- Issuers can use up to 2% of the bond proceeds to finance costs of issuance.³⁰
- Generally, QECBs are subject to rules that apply to tax-exempt bonds.³¹
- State Energy Program (SEP) and Energy Efficiency and Conservation Block Grant (EECBG) funds can be used to support QECB issuances within the limitations set by the Department of Energy. Department of Energy Guidance on the use of QECBs in conjunction with SEP and EECBG funds was provided in July 2010.³² Additional tax rules may further restrict the use of outside funds in conjunction with QECBs and may result in the need for careful structuring. Jurisdictions interested in leveraging funds should consult with their bond counsel. In addition, provisions such as Davis Bacon may apply differently to issuances utilizing EECBG and SEP funds than those that do not.
- The governing body may need to make a formal, irrevocable election to designate the bonds as QECBs. The authorizing document for the issuance should have a section that generally describes provisions of the QECB, including the discussion of the direct subsidy payment (if applicable).³³
- At least 30 days prior to the first interest payment date, the issuing authority must file Form 8038-TC with the US Treasury, along with the QECB debt service schedule.³⁴
- At least 45 days prior to each corresponding interest payment date after the first payment date, Form 8038-CP must be filed. These forms are necessary to receive the subsidy.³⁵
- QECBs are subject to sequestration see Section V.

III. UTILIZATION TRENDS

*Note: Although the IRS collects information on QECB issuances on Form 8038-TC, it has declined requests to disclose this information publicly. As such, it is not possible to ascertain definitively the exact number and quantity of QECB issuances to date. The information in this section has been gathered from various sources, including IRS Notice 2009-29, Bloomberg, the Municipal Securities Rulemaking Board, the U.S. Department of Energy, Lawrence Berkeley National Laboratory, Wells Fargo, state and local issuer websites, and state and local energy, development, finance, and commerce officials who have graciously spoken to or corresponded with EPC and/or NASEO regarding their issuance statuses. EPC's inventory and knowledge of QECB issuances is likely incomplete. **We welcome and are grateful for your feedback regarding any issuances we have missed or errors contained in this paper.***

Eligible issuers of QECBs include states,³⁶ state agencies³⁷ and finance authorities,³⁸ territories, municipalities,³⁹ municipal utilities,⁴⁰ municipal agencies,⁴¹ counties⁴², tribes, school districts,⁴³ and higher education institutions.⁴⁴

²⁹ See 26 USC 54A(d)(2)(a); see also IRS Notice 2010-35, available at www.irs.gov/pub/irs-drop/n-10-35.pdf.

³⁰ See 26 USC 54A(e)(4).

³¹ See IRS Notice 2010-35, available at www.irs.gov/pub/irs-drop/n-10-35.pdf.

³² For EECBG and QECB guidance, please see "Guidance for Energy Efficiency and Conservation Block Grant Grantees on Qualified Energy Conservation Bonds and New Clean Renewable Energy Bonds," available at www1.eere.energy.gov/wip/pdfs/final_eeecbg_guidance_qecbs_crebs.pdf, for SEP and QECB guidance, please see "Guidance for State Energy Program Grantees on Qualified Energy Conservation Bonds and New Clean Renewable Energy Bonds, available at http://www1.eere.energy.gov/wip/pdfs/final_sep_guidance_qecbs_crebs.pdf.

³³ See Department of Energy Technical Assistance Program "Taking Advantage of Qualified Energy Conservation Bonds" (September 22, 2010).

³⁴ See: www.irs.gov/pub/irs-pdf/i8038tc.pdf.

³⁵ See: www.irs.gov/pub/irs-pdf/i8038cp.pdf.

³⁶ For example, in July 2011 the state of Maryland issued \$6.5 million of QECBs for improvements to public schools (direct issuance by state).

³⁷ The Commonwealth of Pennsylvania issued \$15.8 million for retrofit projects for corrections facilities.

³⁸ For example, the Kansas Development Finance Authority issued \$17.8 million for university projects.

³⁹ The city of Waterbury, Connecticut issued \$4.7 million for city facilities retrofit projects (direct issuance by city).

⁴⁰ The Los Angeles Department of Water and Power issued \$131 million for solar and wind projects.

⁴¹ In Minnesota, the Washington County Housing and Redevelopment Authority issued \$2.375 million for energy efficiency improvements.

⁴² Sonoma County issued \$1,977,500 for renewable generation

⁴³ The Menasha School District in Wisconsin issued \$1.69 million for school improvements.

⁴⁴ The University of Colorado issued \$4.375 million for university projects.

Total Number of Qualified Energy Conservation Bonds Known Issued by Issuer Type (as of August 2016)	
Issuer	Number of Issuances to Date
Municipal Government	64
County	58
School District	34
Higher Education	25
State/State Agency	21
Municipal Agency	12
Private Activity Issuance ⁴⁵	9
Utility Authority	6
Total	229

The most common use of QECBs to date has been capital improvements to reduce energy consumption in publicly owned buildings by at least 20% (Energy Efficiency or “EE”),

Most Popular Uses of QECBs as of August 2016

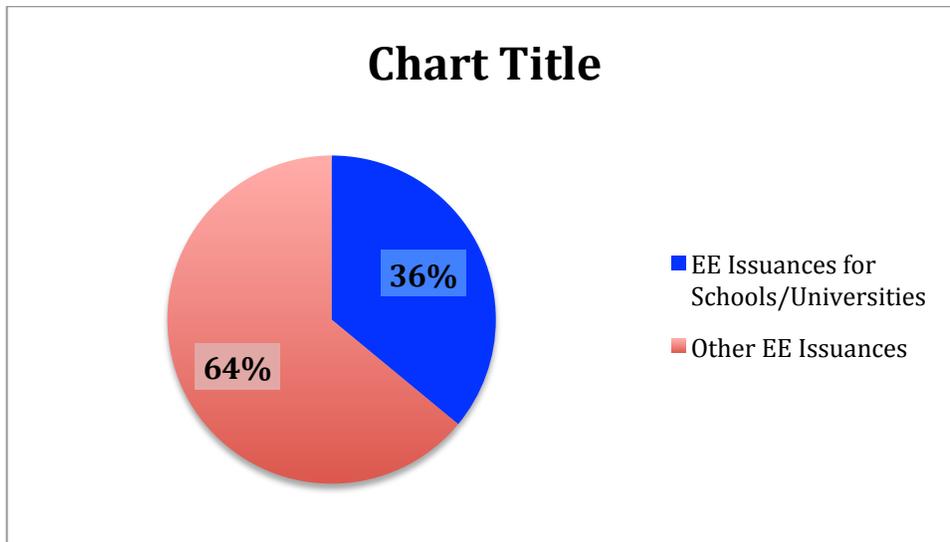
Use	Number of Issuances	% of Issuances
Energy Efficiency	153	67
Renewables	41	18
Green Community Programs	30	13

See Table 1B at the end of this paper for a complete listing of issuances and their use. Energy Efficiency issuances make up almost all known issuances in the Northwest and Southeast regions⁴⁶ and around 67% of total known QECB issuances nationwide. While the majority of energy efficiency QECBs have been issued for public/municipal facilities of some sort, 36% of bonds issued for EE were for school and university projects.

⁴⁵ These issuances are conduit issuances, the actual issuer is a state agency that issues on behalf of the private entity; we have treated them separately from state agencies here for purposes of indicating how many private activity issuances have taken place

⁴⁶ **States in each region** : Central: Colorado, Kansas, Montana, Nebraska, North Dakota, Oklahoma, South Dakota, Texas, Wyoming. Midwest: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin. Northeast: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia. Northwest: Alaska, Hawaii, Idaho, Oregon, Washington. Southeast: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia. Southwest: Arizona, California, Nevada, New Mexico, Utah.

Graph 2 - QECBs Issued for Schools/Universities



Although energy efficiency improvements are the most popular use of QECBs overall, investments in renewables are particularly popular in the Southwest. Of the QECBs issued in the Southwest, 68% have been used for renewable energy facilities, such as installing solar panels at public schools.

At least 30 issuances nationwide to date are known to have been used for, or issued under, green community programs: St. Louis, MO; Boulder, CO; San Diego, CA; Richmond, CA; Las Vegas, NV; GreenFinanceSF, CA; South Carolina SAVES, SC (3 issuances); Missouri Clean Energy District, MO (2 issuances); Memphis Green Communities Program (3 issuances); NYSEERDA, NY; North Carolina Agricultural Finance Authority, NC (4 issuances), Virginia Saves, VA (3), Kitsap County, WA, Renton, WA, Roaring Fork Transportation Authority, CO (2 issuances), Energize New York, NY, Clarksville, TN, Smithville, TX and Silver City, NM. Green Community Programs typically issue QECBs in one of two ways. Some are structured so that the program is established and QECBs issued to fund it. The program then administers the funds for the stated purpose (e.g. San Diego streetlight improvements, St. Louis Saves residential energy efficiency loan program). The second option is that a Green Community Program is set up in conjunction with a state agency that is authorized to issue private activity bonds. QECBs are then issued on a per project basis with each separate project applying to the GCP for financing. For qualifying projects, the GCP works in conjunction with the relevant state agency and the agency acts as a conduit issuer, issuing QECBs and lending the proceeds to the project.⁴⁷ Examples of this type of structure include North Carolina Agricultural Authority GCP and Kitsap County, WA (with Washington State Housing Finance Authority acting as conduit issuer).

Known public education campaign issuances are rare, but one example is Western Wisconsin Technical College's July 2010 issuance. The Spotsylvania, VA rail station and parking lot issuance in July 2012 and the Milwaukee County bus issuance in November 2015 are the only known projects for mass commuting. As of August 2016, EPC is not aware of any QECB issuances used for rural development or research or demonstration projects.

Private Activity Bond Issuances

At least eight QECB issuances to date have been private activity bond issuances, including three in Massachusetts⁴⁸, one in Georgia, one in Lawrence, Kansas⁴⁹, one in Washington state and two in Colorado.

Although Official Statements are not available to confirm, we have learned through interviews with Massachusetts that a state agency, MassDevelopment, issued the bonds on behalf of each private entity.⁵⁰ The Fairhaven Wind project issued

⁴⁷ With a conduit issuance, a state agency issues the bonds but the bonds are not backed by the state and the borrower/project is solely responsible for their repayment

⁴⁸ Fairhaven Wind, Scituate Wind and Westford Solar

⁴⁹ Interview with Diane Stoddard, Assistant City Manager for the City of Lawrence.

⁵⁰ Interview with Elise Avers, Massachusetts Department of Energy Resources.

approximately \$3 million in QECBs in November 2011 and used the proceeds to build two 1.5 MW wind turbines. The Scituate Wind project issued approximately \$1.5 million in August 2011 and used the proceeds to build one 1.5 MW wind turbine. The Westford Solar project issued \$5.8 million in August 2011 and used the proceeds to help fund a 4.5 MW ground-mounted solar project. In Washington, a \$9M wind turbine project was completed in early 2013. It was projected to produce 4.25 megawatts of electricity annually.

In Colorado, the Colorado Housing Finance Authority (CHFA) completed two QECB issuances on behalf of private entities. In April 2012, they issued \$6.7 million in QECBs to a private developer with the proceeds used to finance the installation of solar panels on Denver Housing Authority properties. In August 2013, the CHFA issued \$4.9 million in QECBs to various private entities to finance solar facilities for Denver International Airport, The City of Greeley and the State of Colorado Department of Corrections.

Energy Performance Contract Issuances

At least 24 QECB issuances (as of August 2016) are known to have utilized energy performance contracts.⁵¹ One example is the University of Louisville, which issued \$20.9 million in QECBs for such a project.

Utilization of QECB Allocations State-by-State

Across the United States, state utilization rates range from complete lack of known utilization to complete exhaustion of allocation (99.98% issued in Kansas); see Table 1A. In addition to Kansas, known state leaders include Kentucky (99.79%), Nebraska (98.37%), Colorado (96.38%), Montana (83.03%), California (82.31%), Alabama (81.31%), Louisiana (82.65%), and South Dakota (78.81%). Fourteen⁵² states are not known to have issued any QECBs. In addition, EPC has been unable to locate authorizing documentation for Hawaii, Mississippi, and Wyoming. QECB authorization efforts in Hawaii appear to have stalled in 2012.⁵³ At the time of writing, West Virginia (who had previously confirmed that QECBs had not been authorized) is in the process of reviewing for finalization a draft Executive Order that will authorize their allocation.⁵⁴

Regional Utilization of QECB Allocations

Regionally⁵⁵, known utilization rates range from about 23% in the Northeast to 68% in the Southwest. The Southeast, Midwest, Northwest, and Central regions have utilization rates ranging from about 32% to 49%.

⁵¹ These issuances are the Colorado School of Mines; Commonwealth of Pennsylvania, Fayette County; Kansas Development Finance Authority, Louisville-Jefferson County Metro Government; University of Kentucky; University of Louisville; Department of Corrections, Louisiana, Washington County Housing and Redevelopment Authority; and the Town of Marshfield, Massachusetts.

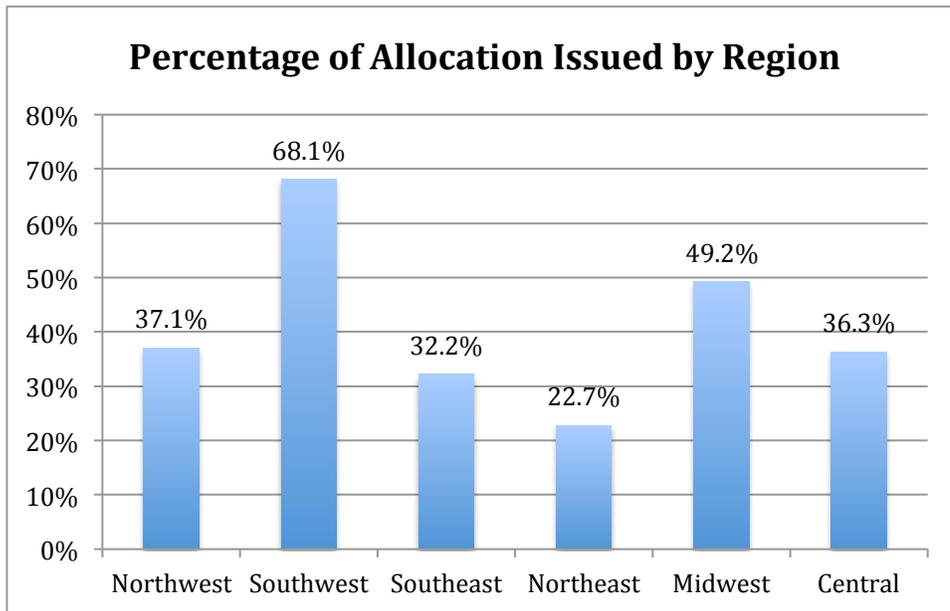
⁵² In addition, 5 US territories have not issued QECBs; status of authorization is unknown as of August 2016

⁵³ HI HB1033, 2012. <http://legiscan.com/HI/text/HB1033/id/623943>

⁵⁴ As per conversations with representative from West Virginia Division of Energy

⁵⁵ **States in each region:** Central: Colorado, Kansas, Montana, Nebraska, North Dakota, Oklahoma, South Dakota, Texas, Wyoming. Midwest: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin. Northeast: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia. Northwest: Alaska, Hawaii, Idaho, Oregon, Washington. Southeast: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia. Southwest: Arizona, California, Nevada, New Mexico, Utah.

Graph 3: QECBs Issued by Region



Local Utilization and Issuance Sizes

At the municipal level, known issuances have ranged from as little as \$120,000 for Rantoul Township High School District 193 in Champaign County, Illinois, to as much as \$131 million for the Los Angeles Department of Water and Power in California (see Table 1B). Large metropolitan areas that have issued QECBs include: Chicago, Philadelphia, Nashville and Davidson Counties (TN), Memphis, Las Vegas, Los Angeles, San Antonio, San Diego, San Francisco, Houston, Milwaukee and St. Louis. Many large metropolitan areas are not yet known to have utilized their allocations, however, and might benefit from coordination with state and territorial energy officials.

IV. BARRIERS TO THE USE OF QECBS

In December 2011, EPC and NASEO reached out to state governments to confirm issuance data and ask questions about state experiences with barriers to issuing QECBs. Twelve states⁵⁶ provided information about barriers to issuances in their state. The most commonly cited barriers were (1) small allocations (four states, or 33% of those that provided information), (2) debt aversion at state and local levels (three states, or 25%), and (3) lack of awareness, familiarity, and/or understanding of QECBs or bonds generally at the state and local levels (two states, or 17%). More recently, in 2012 and 2013, a number of large local governments⁵⁷ have pointed to sequestration concerns.

⁵⁶ Those 12 states are Arizona, Arkansas, District of Columbia, Illinois, Maine, Maryland, New Mexico, North Dakota, Tennessee, Texas, Virginia, and Wyoming. The city of Las Vegas also provided information.

⁵⁷ Examples include Schenectady County, NY and Gresham, Oregon.

Throughout 2013, EPC reached out to large local governments in 11 states⁵⁸ to discuss QECBs and inquire about reasons for nonuse. A total of 230 counties were contacted, with a response rate of 37%. Of the 86 counties who responded 33 provided reasons for nonuse; the most commonly cited barriers were as follows:

Reason for Non-use	No. of Responses	Percentage of Total Responses
Unaware of QECB Allocation	12	36%
No current project	9	27%
Debt Capacity	5	15%
Sequestration	4	12%
Other	3	10%
Total	33	100%

Small Allocations and Issuance Costs

If a state has many local governments with populations greater than 100,000, this necessitates dividing up the total resource into many pieces and also can increase administrative burdens and implementation delays. Small allocation sizes make it challenging to pay issuance costs because small allocations often mean high transaction costs per dollar of bonds issued. This is particularly difficult as only 2% of QECB issuance proceeds may be used for issuance costs.⁵⁹ Transaction costs in many cases are relatively fixed regardless of the size of an issuance.⁶⁰

In 2012, EPC reviewed 66 available official statements to learn more about issuance costs. Of the 66 available, 52 official statements contained information on issuance costs. Based on those statements,⁶¹ EPC found that issuance costs ranged from a low of \$2,400 (Champaign County Township High School District 193, Illinois) up to \$399,000 (Tempe, Arizona)⁶² for issuing QECBs. The median issuance cost was approximately \$53,325 and the median as a percent of total proceeds was 2%. 42% of issuances for which we were able to find information noted issuance costs of 1% or less of total proceeds.

Small issuances may also be difficult to sell.

Techniques for Addressing Small Allocation Issues

Bundling. One approach to dealing with small allocation sizes is to bundle QECBs with other bonds. Of the 79 issuances⁶³ for which information about bundling was available at the time of our 2012 inquiry into this issue, 60 were issued as part of a bundled issuance with at least one other bond issuance. QECBs have been issued simultaneously with other taxable bonds, tax exempt general obligation bonds, revenue bonds, Air Quality Development Bonds,⁶⁴ Build America Bonds,⁶⁵

⁵⁸ Illinois, Michigan, New York, North Carolina, Pennsylvania, Virginia, Minnesota, Missouri, Iowa, Alabama, Wisconsin.

⁵⁹ See 26 USC 54A(e)(4).

⁶⁰ "NASEO and EPC Summary of Barriers for Increasing QECB Activity at the State and Local Levels" (February 2012); "NASEO State Briefing on Qualified Energy Conservation Bonds" (March 2012).

⁶¹ Official statements with breakdown of issuance costs: Allegheny County, PA; Belchertown, MA; Bellingham, WA; Boulder County, CO; Boulder PACE, CO; Chicago, IL; Commonwealth of Pennsylvania; Deerfield, IL; Ely ISD, MN; Fayette County, PA; Foothills, CO; Fort Collins, CO; Grant County, MN; Greene County, MO; Itasca County, MN; Kansas Development Finance Authority; King County, WA; Kitsap, WA; Lake County, SD; Los Angeles Department of Water and Power, CA; Louisville, KY; Mandan School District, ND; State of Maryland; McHenry School District, IL; Menasha School District, WI; Mitchell School District, SD; Pleasant Prairie, WI; Rancho Water District Financing Authority, CA; Champaign County School District 193, IL; Champaign County School District 116, IL; Rapid City, SD; Somerton, AZ; St. Louis County, MO; Tempe, AZ; Thurston County, WA; University of Colorado; University of Kentucky; Washington County Housing and Redevelopment Authority, MN; Waterbury, CT; Western State College, CO; Wyandotte, KS; Yakima County, WA; York, PA; Yuba Community College, CA; Billings School District, MT; Billings School District High School, MT; Spotsylvania County, VA; Nashville and Davidson Counties, TN; Knox County IN; Philadelphia Municipal Authority, PA; Goodhue County, MN.

⁶² The University of Colorado had an issuance cost of \$1.2 million but this was for the entire issuance, which included other bonds in addition to QECBs. The cost for the QECB issuance alone was not broken out in the official statement.

⁶³ EPC was able to locate publicly-available official statements for sixty-six issuances. The additional 13 issuances included in this figure are Ohio issuances for which bundling information was obtained from review of the Ohio Air Development Authority website, press releases, and interviews with staff.

⁶⁴ Twelve of the fourteen issuances in Ohio have involved bundling QECBs with Air Quality Development Bonds: South Euclid, Findlay, Licking County, Pickaway County, Owens State Community College, Ravenna, Hamilton County, three Kent State University issuances, City of Trotwood, Jefferson County, and Ohio University. The Pickaway County issuance involved bundling with Recovery Zone Economic Development Bonds.

⁶⁵ Twelve issuances were bundled with BABs: June 2010 Tucson issuance, University of Kentucky, University of Louisville, Commonwealth of Pennsylvania, Thurston County, City of Chicago, University of Colorado, Champaign County School District 193, Champaign County School District 116, Waterbury City, King County, Kitsap County. Only the University of Kentucky and University of Louisville were issuances of QECBs and BABs alone. The other issuances were bundled with other types of bonds as well.

Clean Renewable Energy Bonds,⁶⁶ Qualified Zone Academy Bonds,⁶⁷ Recovery Zone Economic Development Bonds,⁶⁸ and Recovery Zone Facility Bonds.⁶⁹

Energy Efficiency and Conservation Block Grants. Other jurisdictions have used their EECBGs to help cover issuance and administrative costs. The City of Los Angeles used EECBG funding to help cover interest costs for the first two years of the bond term. St. Louis County used EECBG funding to buy down customer interest rates and to cover the county's program administration costs.⁷⁰

Pooling. Jurisdictions may be able to pool their allocations in order to reduce the transaction cost per dollar financed. This may be done simply by waiving sub-allocations back to the state, but in cases in which this is not possible or desirable, local jurisdictions may in some cases be able to pool their sub-allocations without state involvement. For example, jurisdictions have pooled other tax credit bonds. The Wisconsin Public Finance Authority ("PFA") has facilitated pooled issuances of variable rate revenue bonds,⁷¹ multifamily housing revenue bonds,⁷² disaster revenue bonds,⁷³ and various other types of revenue bond issuances. Similar to PFA, the California Statewide Communities Development Authority (CSCDA) provides local governments with a tool for financing public agency, private activity, and energy finance programs. They have helped finance low-income multifamily and senior housing projects, energy and conservation measures, street lighting, and energy efficiency retrofits. New York has pursued State of New York Municipal Bond Bank Agency pooled Financing of QECBS, meaning that local counties could join their QECB allocations together and issue as one entity. However, while there was some interest in this form of pooling, ultimately an alternative method was used to enable three New York counties (Onodaga, Wayne and Onieda) to issue their QECB allocations. Instead of pooling, the three counties sold their QECBs simultaneously to PFA. PFA then issued non-QECB bonds backed by the underlying QECBs. This enabled the counties to utilize their QECBs without having to pay the high issuance costs associated with having to sell the issuance to the market themselves. An effort to authorize pooling in Hawaii stalled earlier in 2012 after legislators and advocates were unable to obtain guidance from IRS.⁷⁴

Debt Aversion and Debt Caps

Some state and local governments are unwilling to take on additional debt . Other jurisdictions have statutory debt volume caps, which may decrease their motivation to "spend" their volume cap on QECBs versus other types of bonds. In these instances, QECBs and energy efficiency projects may not rank high enough on the state or local government's overall set of priorities for bond issuances.⁷⁵

In some cases, a state may be averse to debt whereas some of its municipalities lack financing options. In these instances, a state might consider an application and award process such as the ones Colorado and Tennessee utilized.⁷⁶ In this process, the state requests applications for allocation awards and cedes portions of its allocation to local applicants who can utilize the funding. Because the allocations are issued by local issuers, they need not increase state-level debt.

Alternatively, debt averse issuers may prefer to cede up to 30% of their allocations (or sub-allocations, as applicable) to private developers for private activity bond issuances.

⁶⁶ Only the Los Angeles Department of Water and Power bundled their QECBs with CREBs.

⁶⁷ Four QECB issuances are known to have been bundled with Qualified Zone Academy Bonds: Alma Center School District, Billings School District High School, Champaign County School District 116, and the state of Maryland. The Alma Center and Billings School District High School issuances were a combination of QECBs and QZABs. The other issuances were bundled with other types of bonds as well.

⁶⁸ Seven issuances are known to have been bundled with RZEDs: Wyandotte County, Champaign County School District 193, Champaign County School District 116, King County, Kitsap County, Pickaway County and Waterbury City. Only Wyandotte and Pickaway Counties bundled QECBs and RZEDs without any other bonds included.

⁶⁹ Lawrence, Kansas bundled its QECBs with Recovery Zone Facility Bonds.

⁷⁰ See Lawrence Berkeley National Laboratory, "Using Qualified Energy Conservation Bonds (QECBs) to Fund a Residential Energy Efficiency Loan Program: Case Study on Saint Louis County, MO" (June 2011), p. 3.

⁷¹ February 15, 2012 issuance. See Official Statement at <http://emma.msrb.org/ER577249-ER448110-ER850651.pdf>.

⁷² September 27, 2011 issuance. See Official Statement at <http://emma.msrb.org/EP571658-EP448706-EP848602.pdf>.

⁷³ September 22, 2011 issuance. See Official Statement at <http://emma.msrb.org/EP572032-EP449005-EP848916.pdf>.

⁷⁴ Interview with Colin Bishop.

⁷⁵ "NASEO and EPC Summary of Barriers for Increasing QECB Activity at the State and Local Levels" (February 2012).

⁷⁶ See Appendix D: State Applications for examples of state application process documentation

Davis Bacon Act and “Buy American” Requirements

All funds made available under ARRA are subject to the requirements of the Davis Bacon Fair Wage Act.⁷⁷ These requirements place a greater burden on the issuer and, especially in cases where other low cost capital is available, make QECBs a less attractive source of financing. Davis Bacon requirements in particular are often cited as a reason for non-use of QECBs, both from a cost perspective and from an administrative standpoint with states/large local governments indicating that their systems are unable to handle the necessary Davis Bacon compliance.

The Buy American provision found in ARRA does not apply to QECBs.⁷⁸

Familiarity and Coordination

In some states a designated agency must be utilized whenever bonds are to be issued; in others a number of different agencies were possible candidates for implementing the QECB program and one was chosen and designated in an executive order or state legislation authorizing the QECB program and suballocations. At least 22 State Energy Offices (SEOs) have been charged with implementing QECBs. See Appendix H for an unofficial list of apparent administering agencies. In other states, bonding authorities, development authorities, or other agencies have been authorized to run the QECB programs. In some instances, the bonding authority may be unclear about eligibility of projects or methodologies for measuring 20% savings. In instances in which the SEO is the designated agency, the SEO may not have bonding experience or may not have a working relationship with bond professionals. In short, increased coordination across state agencies would facilitate implementation in some states.⁷⁹

Similarly, technical assistance and support from the state or the federal government is helpful and, in some cases, necessary for local governments to use QECBs.⁸⁰

Some state agencies administering the QECBs did extensive outreach to local governments to make them aware of this funding opportunity. For example, Maryland Energy Administration (MEA) wrote and distributed QECB information papers and worked with the state Treasurer and the Governor’s office. In Fall 2009, the Governor’s office sent letters to executives and council presidents of each “large local government”, as applicable, with copies to finance directors. The letters included a table of suballocations, MEA/Treasurer contact information, and were followed by a series of phone calls with local government finance staff soliciting feedback on the QECB program and helping establish the groundwork for issuances in Maryland. MEA, the Treasurer, and the Community Development Administration (CDA) continue to consult with suballoctees re QECBs.

Uncertainty

Regulatory and legal concerns also presented a barrier to QECB issuances, particularly in the first years of the program before Notice 2012-44 was issued in June 2012; those concerns and the notice are discussed below. Similarly, after September 2012 but prior to sequester becoming a reality, the threat of cuts to subsidy payments on QECBs was cited by at least one state and one local government as a barrier to issuance. See Section V for an update on sequestration.

⁷⁷ 40 U.S.C. §§ 276a-276a-7, which provides that locally prevailing wages and fringe benefits must be paid to laborers and mechanics employed on federally funded contracts exceeding \$2,000 that may involve construction, alteration, maintenance or repair

⁷⁸ The Buy American provision applies only to programs found in Division A of ARRA. QECBs are found in Division B of ARRA. The provisions found in Division A apply only to that Division: section 4, page 2 states that “The references to “this Act” are treated as referring only to the provisions of that division.” There is no Buy American provision in Division B. This is also the case for program expiration. Since there is no expiration provisions in Division B QECBs do not expire. There is however a separate Davis Bacon provision in Division B and therefore Davis Bacon does apply to QECBs. For full text of ARRA see here: <http://www.gpo.gov/fdsys/pkg/BILLS-111hr1enr/pdf/BILLS-111hr1enr.pdf>

⁷⁹ “NASEO and EPC Summary of Barriers for Increasing QECB Activity at the State and Local Levels” (February 2012).

⁸⁰ “NASEO and EPC Summary of Barriers fInterview with Dan Bresette of the Maryland Energy Administration.or Increasing QECB Activity at the State and Local Levels” (February 2012).

V. UNCERTAINTY, NOTICE 2012-44, AND SEQUESTRATION

A. Introduction

During the early years of the QECB program, a number of legal and regulatory issues delayed or postponed issuances. On June 25, 2012, the IRS issued Notice 2012-44 and resolved many of these issues. Some questions remain. These issues are discussed further below.

Only months after Notice 2012-44 seemed to resolve the most commonly raised concerns regarding QECBs, budget talks surrounding the “fiscal cliff” resulted in a different but equally problematic uncertainty: it was no longer clear how much, if any, subsidy payment QECB issuers would receive, even if they had issued bonds prior to the date on which sequestration cuts were to occur.

B. Sequestration

The White House Office of Management and Budget (OMB) released a report on September 14, 2012 noting potential spending cuts that could come into effect on January 2, 2013, if Congress did not act to modify the Budget Control Act of 2011. With the passage of The American Taxpayer Relief Act of 2012 (H.R. 8), March 1st, 2013 replaced January 2nd, 2013, as the date when cuts will occur should Congress fail to reach an agreement on budget cuts. Since Congress did not provide otherwise, a “sequestration” process occurred that reduced funding for a wide range of government programs, including QECBs.

The OMB report indicated that among the potential cuts under sequestration are an estimated \$2 million reduction to the Qualified Energy Conservation Bond (QECB) program which would likely affect the issuers of existing bonds. At the time, Reuters and the Bond Buyer reported that similar cuts to the Build America Bond program could take away subsidy payments on existing bonds. Although the FY 2013, FY 2014, FY 2015 and FY 2016 sequester amount for QECBs (see below) are not very large in the context of the overall program, the difference could be significant for issuers on tight margins.

To access OMB’s reports on sequestration, please visit: http://www.whitehouse.gov/omb/legislative_reports/sequestration

Sequester Effects on QECBs

For the fiscal year 2016 (ending September 30, 2016) the sequester reduction is **6.8%**. On August 3, 2016 the IRS issued the fiscal year 2017 update regarding the effect of sequestration on QECB issuers.⁸¹ The sequester reduction is applied to section 6431 amounts claimed by an issuer on any Form 8038-CP filed with the Service which results in a payment to such issuer on or after October 1, 2016. The sequestration reduction rate will be applied unless and until an intervening Congressional action, at which time the sequestration rate is subject to change, effectively making these cuts permanent. As determined by OMB, payments to issuers from the budget accounts associated to these qualified bonds are subject to a reduction of **6.9%** of the amount budgeted for such payments.

The new rate represents a slight increase over the FY 2016 rate and is effective unless and until Congress takes action, with no specified end date.

The sequester’s effect on QECBs issued as tax credit bonds (with tax credits for the holders rather than cash subsidies for the issuer) remains unclear, as it is not specifically mentioned in any IRS guidance. It appears that tax credit QECBs may not be subject to the cuts.

Six counties have cited sequestration as a reason for not actively pursuing QECBs. Two of these counties have expressed reluctance to issue tax credit bonds in general, due to the effect of sequester on BABs, and their experience with those bonds

⁸¹ <https://www.irs.gov/tax-exempt-bonds/fy2017-update-effect-of-sequestration-on-state-local-government-filers-of-form-8038-cp>

Intended Scope

The Notice confirms that Congress intended to give state and local governments “wide” and “broad” discretion issuing QECBs. This confirmation should guide IRS auditors when reviewing issuances and provide some additional comfort to issuers and their counsel.

Capital Expenditure Requirement

The QECB legislation requires for some uses that QECB proceeds be spent on capital expenditures. Notice 2012-44 provides guidance on determining whether an expenditure is a “capital expenditure” for purposes of the QECB rules, helpful clarification for issuers of any type of QECB.

20% Savings

As noted earlier, a common use of QECBs is to reduce energy consumption in publicly owned buildings by at least 20% through capital improvements. Prior to the publication of Notice 2012-44, however, there was a great deal of uncertainty about how exactly issuers were required to estimate or measure the required energy savings.

Notice 2012-44 provides pages of information on how issuers can properly estimate projected reductions in energy consumption due to improvements financed by QECBs. It explicitly distinguishes the rules applicable in the context of Internal Revenue Code section 179D, another provision that provides tax benefits for reductions in energy consumption in government buildings.

Instead, the Notice provides specific guidelines for QECB issuers. Energy savings can be measured building by building or across all the buildings improved with the QECB proceeds. They can also be measured by a component or multiple components of the energy system of the building or buildings in question (e.g., HVAC, hot water, lighting, building envelope, or “plug load” due to items plugged into outlets such as refrigerators).

The issuer must “reasonably expect” that the capital expenditures to be financed with the bond proceeds will result in a 20 percent or greater reduction in energy consumption for the selected building, buildings or building system component using a “common energy unit” such as a MMBtu (one million British thermal Units).

In order to determine whether the issuer’s expectation was reasonable, Treasury will look to whether the issuer or its engineer used such tools as an ASHRAE level 3 audit, building energy use simulation techniques and estimating software (including the DOE (Department of Energy) 2 based Quick Energy Simulation Tool (eQUEST)) or other qualified computer software for calculating commercial building energy and power cost savings that meet federal tax incentive requirements as listed by Department of Energy’s Building Technology Program at:

http://apps1.eere.energy.gov/buildings/tools_directory/.

The issuer must use a “reasonable and consistently applied” method to measure (actual or projected) energy savings over a “reasonable and consistent time period” of at least one year (e.g. energy use in the year before the improvements were made and in the year following the improvements). The issuer need not subsequently demonstrate energy savings. An issuer may rely on an engineer’s certification (an example is provided in the notice) if the actual capital improvements financed by the QECB proceeds are substantially similar to those contemplated as the basis for the certification.

Green Community Programs

The term “green community programs” was not defined in the statute or IRS guidance until June 2012; Notice 2012-44 addresses this issue. To qualify as a “green community program” for QECB purposes, the Notice provides that a program must both promote “energy conservation, energy efficiency or environmental conservation initiatives related to energy

consumption, broadly construed” and either involve property that is available for “general public use” (such as replacing streetlights on public roads with LED bulbs) or loans/grants that have “broad public availability” (including residential housing or private building energy efficiency initiatives that provide grants or loans that are broadly available for homeowners or businesses).

The Notice incorporates the frequently-cited conference report that indicates that a green community program can finance retrofits of existing private buildings through loans and/or grants to individual homeowners or businesses, or through other repayment mechanisms.⁸² Retrofits can include heating, cooling, lighting, water⁸³, conservation, storm-water reduction, or other efficiency measures.⁸⁴

Notice 2012-44 indicates that the contact at the IRS is Zoran Stojanovic. The phone number listed in the notice has been updated to: (202) 317-4564.

⁸² The conference report provides: “...the provision clarifies that capital expenditures to implement green community programs includes grants, loans, and other repayment mechanisms to implement such programs. For example, this expansion will enable States to issue these tax credit bonds to finance retrofits of existing private buildings through loans and/or grants to individual homeowners or businesses or through other repayment mechanisms. Other repayment mechanisms can include periodic fees assessed on a government bill or utility bill that approximate the energy savings of energy efficiency or conservation retrofits. Retrofits can include heating, cooling, lighting, water-savings, stormwater-reducing, or other efficiency measures.” See H.R. Report 111-16 Conference Report to Accompany H.R. 1: Making Supplemental Appropriations for Job Preservation and Creation, Infrastructure Investment, Energy Efficiency and Science, Assistance to the Unemployed, and State and Local Fiscal Stabilization, for the Fiscal Year Ending September 30, 2009 and for other purposes. February 12, 2009 p. 627

⁸³ One issuer reported that the IRS declined to rule favorably on whether water-conserving improvements were valid uses of QECBs issued under the 20% reduction in energy consumption prong of the eligible conservation purposes definition.

⁸⁴ See: www1.eere.energy.gov/wip/solutioncenter/pdfs/taking_advantage_of_qualified_energy_conservation_bonds_qecbs_presentation.pdf.

VI. UPDATES SINCE EPC QECB MEMO DATED OCTOBER 2015

The increase in known projects from 209 to 229 consists of 18 new QECB issuances since our October report and 2 previously unknown issuances. Newly reported issuances include:

- School District Number 129 Kane County (Aurora West), Illinois, \$4,865,000 (October 14, 2015). Renewable Generation - Geothermal - Building Level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
- Metropolitan Water Reclamation District of Greater Chicago, Illinois, \$4,000,000 (June 7, 2016). EE - Utility-Scale EE, Renewables and Resilience - wastewater system EE
- Orleans Parish/Louisiana Stadium and Exposition District, Louisiana, \$7,500,000 (December 2015). EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - sports stadiums and related facilities
- St. Louis Municipal Finance Corporation, Missouri, \$3,635,000 (May 4, 2016). EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
- Wayne County, New York, \$2,920,000 (December 15, 2015). EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
- Onondaga County, New York, \$2,650,000 (December 15, 2015). EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
- Oneida County, New York, \$1,845,000 (December 15, 2015). EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
- Energize NY/Town of North Salem, New York, \$23,997 (January 15, 2016). EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - multifamily housing (affordable housing)
- SC Saves/Sumter County, South Carolina, \$5,262,000 (December 15, 2015). EE - ESPC- Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
- City of Clarksville, Tennessee, \$1,240,000 (March 9, 2016). GCP - Utility Scale EE, Renewables and Resilience – Streetlights
- City of Wharton, Texas, \$1,596,383 (November 12, 2015). EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities (equipment lease purchase)
- City of Bowie, Texas, \$4,100,000 (October 5, 2015). EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
- Hearne ISD, Texas, \$1,525,000 (November 18, 2015). EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities – schools
- City of Smithville, Texas, \$2,800,000 (December 22, 2015). GCP - Utility-Scale EE, Renewables and Resilience - utility meters
- Virginia SAVES, Virginia, \$2,500,000 (January 1, 2016). GCP - EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - commercial (private school)
- Virginia SAVES, Virginia, \$3,300,000 (January 1, 2016). GCP - EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities – schools
- Virginia SAVES (Warren County Schools), Virginia, \$8,691,000 (February 16, 2016). GCP - EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities – schools
- Milwaukee County, Wisconsin, \$4,860,000 (November 12, 2016). Transportation, Mass Commuting & Vehicles - Commuter Buses

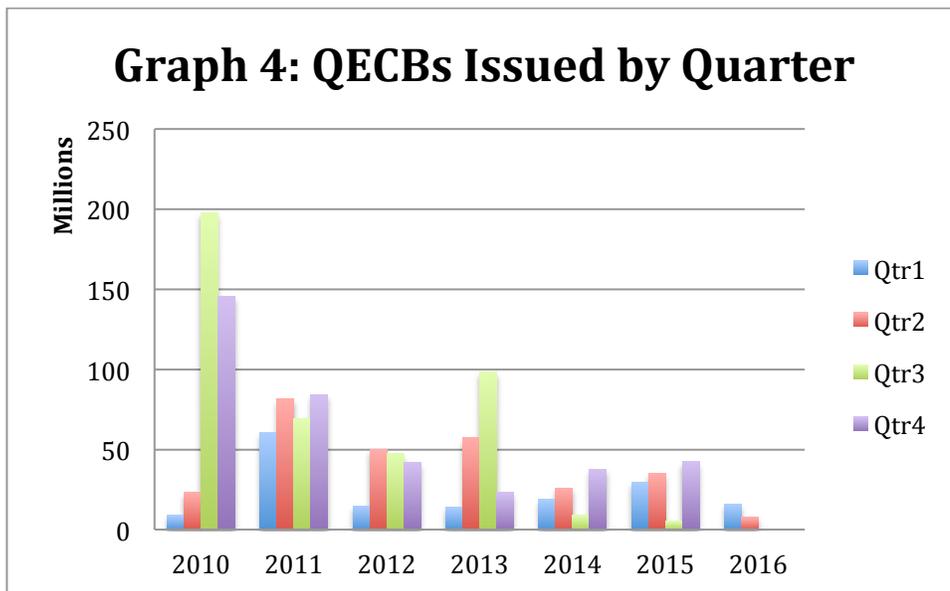
See Table 1B for a complete list of known issuances.

Taking into account all of these issuances, total known QECB issuances have now reached \$1.26 billion. See Tables 1A and 1B at the end of this paper. This figure represents an increase of \$70 million (5.8 percent) since the publication of the October 2015 version of this paper.

Due to the addition of new and previously unknown issuances, known state utilization rates increased in ten states: Illinois, Louisiana, Missouri, Nebraska, New York, South Carolina, Tennessee, Texas, Virginia and Wisconsin.

Known utilization rates have increased in four of six regions. The Southeast showed the biggest change, increasing from 28.3% to 32.2% as a result of new issuances in Louisiana, Tennessee, South Carolina, and Virginia. The Midwest region increased from 46.5% to 49.2% as a result of new issuances in Illinois, Missouri, and Wisconsin. The Northeast saw an increase from 20.9% to 22.7% as the result of new and previously unknown issuances in New York. The Central region saw an increase from 33.5% to 36.3% as a result of new issuances in Texas and a previously unknown issuance in Nebraska. We are not aware of any issuances in the Northwest or Southwest since October 2015, with the utilization rate for the Northwest remaining at 37.1% and the Southwest remaining at 68.1%.

The graph below shows the rate of QECB issuances on a quarterly basis beginning in the first quarter of 2010. \$23,389,997 of QECBs have been issued in the first 2 quarters of 2016, a 63% decrease over the \$64,644,032 issued for the same two quarters of 2015.



VII. CASE STUDIES

Building-Level Energy Efficiency, Water Efficiency, Renewables and Resilience – Large Commercial



Image: Pier 1; Source: <http://prologispier1.com>

GreenFinance SF, San Francisco, CA

On October 15, 2012, GreenFinance SF issued \$1,400,000 of QECCBs as part of a Commercial PACE (C-PACE) green community program. The QECCBs were issued to finance energy efficiency and solar upgrades for San Francisco’s Pier 1, a 151,000 square foot commercial class A office space owned by the Port of San Francisco (“The Port”) and located on a renovated pier on San Francisco’s historic waterfront. The building had been converted to offices in 1999 as part of a public-private partnership with the Port of San Francisco that gave building operator Prologis a 50-year master lease on the property. At the time of financing the building had 5 subtenants in occupancy, including the administrative offices of the Port of San Francisco.

The energy efficiency upgrades (completed by Johnson Controls) included retrocommissioning of building systems, installation of a 200kW rooftop solar array and upgrades to lighting systems. The energy savings as a result of the upgrades were estimated to be around 390,486 kWh, amounting to annual savings of almost \$100,000.

The project was financed with 20-year QECCBs at an interest rate of 6.93% to the bondholders and a net interest rate for the issuer after subsidy of 3.86%. Davis Bacon applied but did not have a significant impact on wages due to pre-existing prevailing wage requirements due to Port ownership/involvement.⁸⁵

The project was the first C-PACE project in the City and County of San Francisco and also the first privately financed C-PACE project to incorporate both energy efficiency and renewables. In addition it was the first PACE project in California to finance the retrofit of a publically owned building using the leasehold of the master tenant as collateral. While PACE is not typically available for publicly owned properties, the legal structure of the GreenFinance SF program allowed the 50-year master lease to act as the interest for securing the lien (the leasehold had to run longer than the lien term for this to be possible).⁸⁶ Prologis reached agreement with all subtenants to pass through the pro-rata share of additional property tax assessments as the result of the PACE financing but also agreed to pass along all energy and cost savings associated with the retrofit. As such, the tenants receive their proportional share of both the benefits and the costs of the project over the 20-year term.

⁸⁵https://www4.eere.energy.gov/challenge/sites/default/files/uploaded-files/DOE_BBC-PACE_Clean_Fund_Playbook_2-17-14.pdf

⁸⁶For discussion of the legal structure underlying this program and subsequent legislative changes in California see https://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/PACE_in_California.pdf

Building Level Energy Efficiency, Water Efficiency, Renewables and Resilience – Multifamily Residential – Multifamily PACE



Image from PACE Nation: <http://www.pacenation.us/pace-talk-missouri-clean-energy-district-completed-its-first-pace-financing-a-closer-look-at-the-670000-wornall-plaza-project>

Missouri Clean Energy District – Wornall Plaza Condominiums, Kansas City, Kansas

In November 2014, the Missouri Clean Energy District (MCED) issued \$571,430 in QECBs for a Property Assessed Clean Energy (PACE) loan to finance energy efficiency improvements to the 88-unit Wornall Plaza Condominiums in Kansas City, Missouri. Missouri established a PACE program in 2010 and the city of Kansas City subsequently adopted an ordinance that established an affiliation with MCED to make PACE financing available to commercial building owners in the city.

The Wornall Plaza complex was in need of major upgrades to the heating and cooling system. The building residents and the building's management company, Signature Property Management, were concerned with the financing of these improvements as most traditional commercial financing structures would involve dipping in to the building's capital reserve and charging owners an assessment, a very unpopular option. Signature Property Management engaged an ESCO, Energy Solutions Professionals, who had previously worked closely with BluePath Finance, a finance company specializing in energy efficiency financing. BluePath suggested using PACE financing as it allowed for 10 year financing (as opposed to 5-10 years for traditional financing options) and would lead to positive cash flow savings. The unit owners found this option very appealing and chose to move forward with the PACE financing. The financing was structured as a loan between MCED and Wornall Plaza financed by the QECBs that were issued by MCED and purchased by BluePath. To enable the use of QECBs, which substantial reduced the cost of the project, Kansas City allocated \$571,430 of its \$4,670,389 in QECB allocations to MCED.

The energy conservation measures financed by this project included low-wattage LED and fluorescent lighting, heating and air conditioning upgrades, and enhanced building controls. The primary goal for the building owner was to replace the original 1960s boilers that required repairs. These old boilers were replaced with three highly efficient boilers that use 60% less gas.



Green Community Programs – NYSERDA, New York

In August 2013, the New York State Energy Research and Development Authority (NYSERDA) issued \$24.3 million of QECBs for the Green Jobs – Green New York (GJGNY) residential energy efficiency loan program. The bond proceeds were used to replenish the \$42.5 million GJGNY revolving loan fund that began in with the GJGNY Act of 2009, a statewide initiative to promote energy efficiency and the installation of clean technologies to reduce energy costs and greenhouse gas emissions, support sustainable community development and create opportunities for green jobs.

Because it had no history of issuing bonds, NYSERDA initially struggled to achieve a rating that would enable the QECBs to be sold at an interest rate that made the transaction worthwhile. To achieve a more favorable rating, the New York State Environmental Facilities Corporation (EFC) guaranteed the issuance through its State Revolving Fund (SRF) program. This guarantee enabled the bonds to be rated AAA/Aaa by Standard & Poor's and Moody's.

This transaction was the first in the nation to utilize the SRF to support initiatives that address atmospheric depositions that impact public health and pollute critically-important water bodies. EFC determined these bonds qualified for financial assistance under the Clean Water SRF because of the reductions in fossil fuel combustion and related reductions in air pollutants being emitted and deposited into New York State's water bodies as a result of residential energy efficiency improvements.

The QECBs were sold with an average term of approximately 6.8 years and an average interest rate of approximately 3.21%. The net interest cost is anticipated at approximately 0.48 percent. This low cost of financing therefore allowed NYSERDA to continue to offer GJGNY loans to consumers at low interest rates. The transaction recognized as the 2013 Small Issuer Financing Deal of the Year by The Bond Buyer, a leading public finance publication.

For further documentation on this issuance see the section **NYSERDA Sale of QECBs Supports Residential Energy Efficiency** at <http://www.naseo.org/financing-resources-qecb>



Image via: www.bouldercounty.org

Commercial PACE – Boulder County, Colorado

In November 2010, Boulder County issued \$1.515 million in QECCBs for a Property Assessed Clean Energy (PACE) commercial program. PACE financing is an approach by which a municipality can fund commercial and/or residential energy improvements; those improvements are repaid through a yearly property.

Boulder County negotiated a private placement of the bonds with UMB Bank. The bonds had one maturity date and one interest rate but were issued in three parts: \$115,000 for 5-year loan terms, \$1.4 million for 10-year loan terms, and \$30,000 in non-QECCBs (to help cover issuance costs). Interest rates to consumers were below 3% for both the 5-year and 10-year term options.

Commercial entities interested in the PACE commercial program had to submit project applications by August 2010. Eligible entities included non-profits, apartment buildings, small manufacturing facilities, and multifamily, low-income, and/or elderly housing complexes. The county then pre-qualified and approved all of the improvements that would be funded before the QECCBs were issued. By requiring that applications be submitted prior to bond issuance, Boulder County could determine exactly how large a bond issuance it needed; the process also gave the county more confidence about bond repayment.

Twenty-nine projects were approved by March 23, 2011 and the program was fully subscribed. The average project size is \$51,000. Fifty-five percent of the measures known funded through the Boulder PACE QECCB proceeds are energy efficiency improvements: HVAC units (30%), cool roofs (11%), insulation of doors and/or windows (8%), and other insulation (6%). Sixteen percent are renewable energy improvements: solar (11%) and solar hot water (5%). Twenty-nine percent of the projects are other measures, such as lighting, retro commissioning, and energy managements systems.

Building-Level Energy Efficiency, Water Efficiency, Renewables and Resilience - University



Image: Ohio University campus. Source: <http://www.ohio.edu>

Ohio University, Athens, Ohio

On July 1, 2012 Ohio University issued \$8,500,000 in QECCBs as part of a \$29 million Energy Performance Contract (EPC) for energy efficiency upgrades at its Athens, Ohio campus. The financing came from the Ohio Air Quality Development Authority and including Air Quality Development bonds along with the QECCBs. The project required no up front capital from the university. Improvements financed included campus wide lighting retrofits, air system and tower condition improvements, heating/ventilation/air conditioning (HVAC) direct digital control system expansion, pipe and blanket insulation and retro commissioning of various building equipment and water conservation measures.

The project was anticipated to result in energy savings of over \$1.9 million. The savings will be used to make principal and interest payments on the bonds over the project's 15-year term. When complete, the project will generate significant air quality benefits including the removal of 50,145 tons of carbon dioxide, 10w tons of nitrogen oxide and 262tons of sulfur dioxide. These reductions are the equivalent of removing 13,359 cars from the road or planting 16.7 million trees.

With the subsidy, the net interest rate for the QECCB portion of the financing was 1.4142 percent. This issuance is one of a number of large university energy efficiency upgrade projects in Ohio financed by QECCBs issued from allocations given by the Ohio Air Quality Development Authority.

Building Level Energy Efficiency, Water Efficiency, Renewables and Resilience - Prisons



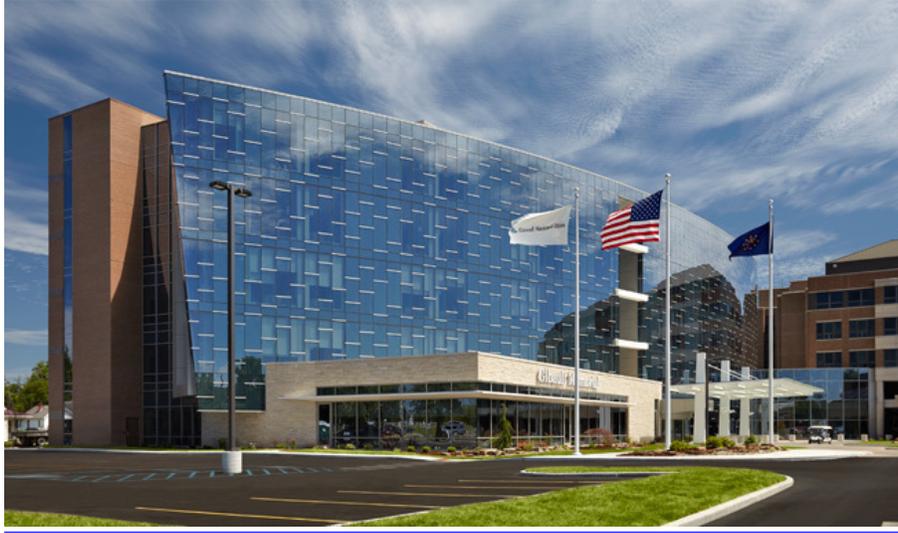
Image: Louisiana State Penitentiary; Source: <http://www.doc.la.gov/pages/correctional-facilities/louisiana-state-penitentiary/>

Louisiana Department of Public Safety and Corrections

In December 2011, the Louisiana Local Government Environmental Facilities and Community Development Authority issued \$31,000,000 of QECBs on behalf of the Louisiana Department of Public Safety and Corrections-Corrections Services for energy efficiency upgrades to nine facilities statewide. These facilities were: Louisiana State Penitentiary; Elayn Hunt Correctional Center; Louisiana Correctional Institute for Women; Dixon Correctional Institute; David Wade Correctional Institute; B.B. Rayburn Correctional Center; C. Paul Phelps Correctional Center; Forcht-Wade Correctional Center; and the Louisiana Department of Public Safety and Corrections' headquarters in Baton Rouge. The \$31,000,000 in QECBs issued comprised of a combination of the State of Louisiana's \$17,282,462 retained allocation and a portion of the \$20,986,830 of QECBs that were waived back to the state by large local governments. This issuance accounted for 66.26% of Louisiana's total QECB allocation.

The QECB proceeds were used for upgrades to correctional facility buildings that were in excess of 30 years old and that contained building systems that were of a similar age. The planned uses of the proceeds included replacing boilers that provide hot water to laundries, showers and kitchens; replacing heating units that heat dormitories; replacing chillers for administration buildings and infirmaries that need cold water for air-conditioning systems; replacing lighting; and installing systems that monitor thermostats. The project was anticipated to have no out-of-pocket cost to the state with the savings from the projects being sufficient to repay the costs of financing.

Building-Level Energy Efficiency, Water Efficiency, Renewables & Resilience - Hospitals



New patient tower, Good Samaritan Hospital. Image from BSA Lifesciences, project architect <http://www.bsalifestructures.com/gibault-memorial-tower>

Knox County, Indiana – Good Samaritan Hospital

On April 12, 2012, Knox County, Indiana issued \$16,200,000 of QECBs on behalf of the Good Samaritan Hospital Board of Trustees, which operates the Good Samaritan Hospital, an acute care hospital located in Vincennes, Indiana that is the county hospital for Knox County. The hospital is organized as a unit of the county government.. The QECBs were issued as economic development revenue bonds and used to finance the construction and installation of various energy efficiency upgrades as part of a larger \$109 million project. The existing hospital facilities were renovated and a number of new facilities were constructed: a new patient tower housing 120 patient beds, a new wing for prenatal and obstetrics care, a cardiac catheterization laboratory and a clinical decision unit.

The project replaced existing systems that were over 40 years old with a new central plant to include chilled water, steam generation, electrical power systems and other energy and utility systems.

Utility-Scale Energy Efficiency, Renewables and Resilience – Hydroelectric



Image from <http://www.bowersockpower.com/about> showing part of the flow control system of the dam

Lawrence, Kansas

On October 3, 2011 the city of Lawrence, Kansas issued \$8,720,000 of QECBs for the Bowersock Mills & Power Company Hydroelectric Project. The QECBs, which were issued as industrial development bonds, were part of a larger \$23,815,000 issuance of industrial development bonds. The bonds were issued as private activity bonds on behalf of the Bowersock Mills & Power Company (“Bowersock”). The issuance was used to finance the expansion of the electricity generating capacity of the Bowersock Dam and South Powerhouse, a run-of-river hydroelectric facility located on the Kansas River in Lawrence, Kansas. The project financed the construction of a new North Powerhouse, which was completed in December 2012. The new powerhouse houses four additional turbine generators and provides a total additional capacity of 4.6 MW. The addition of the four new generators allowed Bowersock to approximately triple the energy production from the facility on an annual basis. The bonds were sold via private placement and had an interest rate of 8.80%..



Boulder Housing Partners, Boulder, Colorado

One of the first QECB issuances in the United States was the Boulder Housing Partners (BHP) August 25, 2010, issuance of \$1.44 million for energy efficiency improvements to public housing projects. BHP used the bond proceeds for an Energy Performance Contract (EPC) to do weatherization and other energy-reduction improvements on BHP's eight public housing sites, work that was expected to reduce carbon emissions in BHP's housing by 6,915 metric tons over the life of the project. These QECBs were issued jointly with \$120,000 of Build America Bonds (BABs), which were needed to finance planned water-conservation improvements after the IRS refused to rule that such improvements would count as energy reducing under the 20% test.

The timeline for BHP's QECB issuance was as follows: BHP applied for the QECB allocation on November 16, 2009, and received its allocation from the state on February 11, 2010. In May 2010, it issued a Request for Proposals for bond counsel. In August 2010, BHP issued \$1.45 million of 16-year QECBs to finance the improvements as well as issuance and bond counsel costs associated with the offering. BHP experienced some difficulty placing the bonds due to the small size of the offering. However, BHP's QECBs were successfully sold in a private placement to Bank of America.

The energy savings realized, combined with the U.S. Department of Housing and Urban Development subsidy, cover the interest and principal payments on the bonds. BHP estimated that traditional financing would have cost 2 percentage points more than was achieved with this offering.

Building-Level Energy Efficiency, Water Efficiency, Renewables & Resilience - Municipal Facilities



Image: Philadelphia City Hall; source <http://www.phila.gov/virtualch//index.html>

Philadelphia, Pennsylvania

On May 11, 2012 the Philadelphia Municipal Authority issued \$6,250,000 of QECBs for energy efficiency upgrades to city buildings. Philadelphia decided to use energy savings performance contracting (ESPC) for these upgrades as it guaranteed energy savings and allowed the entire project to be bid out to a single energy service company (ESCO) rather than seeking separate bids for different aspects of the work.

The Philadelphia Mayor's Office of Sustainability (MOS) began implementing the ESPC in spring of 2012 and NORESO was contracted to perform the upgrades for the four largest city owned buildings including City Hall and the City's courthouse. The upgrades included lighting system replacements, control system upgrades and water conservation improvements. The MOS estimated that the energy savings from these improvements over the 15-year life of the ESPC would be around \$10 million. The Philadelphia Municipal Authority issued \$12.6 million of revenue bonds to finance the upfront cost of the ESPC. \$6.25 million of these were QECBs and thanks to the QECB subsidy the net interest cost for the total issuance (QECB and non-QECB) was 2.31%. The city did not use its entire QECB allocation of \$15 million for the project because of concerns that not all of the buildings in the project portfolio would achieve the 20% energy savings necessary to use QECBs. However, shortly after the transaction closed the Treasury issued IRS Notice 2012-44 which provided guidance on the 20% reduction in energy use and clarified that the reduction can be measured across a portfolio of building rather than for each building individually. The QECBs and the non-QECB bonds structured as a public issuance and were revenue bonds rated A2 by Moody's.

[For further details on this project see LBL's Clean Energy Policy Brief found here:](http://www.osti.gov/scitech/servlets/purl/1223008)
<http://www.osti.gov/scitech/servlets/purl/1223008>

Building Level Energy Efficiency, Water Efficiency, Renewables and Resilience – Parks and Recreation



Foothills Park and Recreation Division's Peak Community & Wellness Center, image courtesy of <http://www.ifoohills.org>

Foothills Park and Recreation District – Jefferson County, Colorado

On August 13, 2010, Foothills Park and Recreation District issued \$1,000,000 of QECBs for energy efficiency upgrades to their facilities. Foothills Park and Recreation District (FHPRD) is located in Jefferson County, Colorado and it is a separate agency with its own taxing authority and authority to issue bonds. FHPRD operates 70 park sites totaling over 2,400 acres including four regional parks, 43 community and neighborhood parks, 23 greenbelts and two golf courses. Facilities include three recreation centers, one ice arena, four indoor and four outdoor swimming pools and one sports arena.

FHPRD worked with McKinstry on an Energy Savings Performance Contract (ESPC) that used QECBs to fund multiple energy conservation measures throughout their facilities, including the installation of a system that recovers waste heat from the ice rink chiller system to heat water for the neighboring swimming pools at the Ridge Recreation Center.

Utility-Scale EE, Renewables and Resilience – SmartGrid



Image: sample SmartGrid meter; source: <http://tdworld.com/news/fort-collins-utilities-deliver-multi-utility-smart-grid-ami-deployment>

Fort Collins, Colorado

On June 28, 2010, the City of Fort Collins, Colorado issued \$6,410,000 in QECBs for a SmartGrid system. The QECBs were used to finance a portion of the City of Fort Collins' Front Range Smart Grid development project in conjunction with a Smart Grid Investment Grant (SGIG) from the U.S. Department of Energy. The City of Fort Collins' Front Range Smart Grid Development project involved the municipal utilities for the cities of Fort Collins and Fountain, Colorado. The project included citywide deployment of advanced metering infrastructure (AMI) for water and electric meters which allow for two-way digital communication between the meter and the utilities. Using AMI technology provides system and operational improvements and allows customers more flexibility when it comes to electric and water meters.

The program aimed to install around 79,000 smart meters. Once installed the smart meters allow the utilities to analyze meter data to maintain system reliability, make operations more cost effective, provide more information to customers and better prepare the utilities and the customers for emerging technologies. Smart meters help to conserve environmental and economic resources by reducing the losses in electricity and water infrastructures. The meters also better enable utilities to implement demand response programs that can conserve resources and reduce costs, particularly during periods of peak demand. For customers the benefits include improved outage response and repair time and the ability to see real-time information to allow them to better manage their energy consumption.

Transportation, Mass Commuting and Vehicles – Compressed Natural Gas Buses



Image of Velocirfta bus from <http://www.rfta.com/routes/velocirfta-brt/>

Roaring Fork Transportation Authority, Colorado

In August 2012, the Roaring Fork Transportation Authority (RFTA) issued \$6,650,000 of QECBs for the purchase of Compressed Natural Gas (CNG) buses. RFTA is the second largest transit system in Colorado and is among the largest rural public transit system in the United States. It operates a rural Bus Rapid Transit (BRT) system in the United States along the corridor between Glenwood Springs and Aspen. The system is known as the VelociRFTA Bus Rapid Transit system and comprises 13 stations that span 42 miles of State Highway 82. RFTA had been planning the BRT system for 11 years prior to deciding in March 2012 to move forward with using CNG buses for the project. The RFTA anticipated that operating CNG vehicles would save over \$250,000 per year compared to diesel-fueled buses.

The QECBs were issued under a Green Community Program as part of a \$16.4 million purchase of 22 CNG buses and related facilities updates and fueling station construction. Other project funding included grants from the Federal Transit Administration and the private sector. The subsidy on the QECBs meant that the RFTA was able to finance almost half of the project at an effective interest rate of 1.7%.

Both the project and the financing have received awards in recognition of their innovation. The White House recognized the RFTA as a Transportation Innovators Champion of Change in 2012 for its CNG BRT system, and the QECB issuance won recognition from The Bond Buyer (an industry publication) as the 2012 Deal of the Year in the small issuer category.

In October 2013, shortly after the first issuance, RFTA voted to expand the GCP to allow for more energy efficiency upgrades, improvements and renovations at RFTA facilities. The State of Colorado awarded RFTA addition volume cap allocation to finance the project. In November 2013, RFTA issued an additional \$1,300,000 in QECBs to finance energy efficiency measures as part of the recommissioning of the 30 year old Aspen Maintenance Facility.

For more information on this project see: <https://www.whitehouse.gov/blog/2012/07/30/urban-growth-through-rapid-transit>; <http://www.nrel.gov/docs/fy15osti/63893.pdf>

Transportation, Mass Commuting and Vehicles – Commuter Rail and Stations



Image: Spotsylvania VRE station; Source: Spotsylvania County Government

Spotsylvania, Virginia

Spotsylvania County issued \$1.2 million in QECBs on July 19, 2012. The County used the proceeds (along with \$19.2m from various sources including federal and state funds and other general obligation bonds) to construct and equip a passenger train station and 1,000 space parking area in the County along the Virginia Railway Express (VRE) rail line.

The station is Spotsylvania's first commuter rail station. About 900 Spotsylvania citizens are estimated to be VRE riders, but these riders had previously needed to drive a significant distance to reach the nearest VRE station in Fredericksburg.

Spotsylvania County estimates that up to 50 percent of the 900 drivers travelling the route from the existing VRE terminus by car would extend their VRE trip rather than drive this route as a result of the new station and parking lot. After experiencing some delays, the station opened on November 16, 2015.

The County, which was already familiar with the structure of QECBs because of its experience with Build America Bonds (BABs), chose to issue QECBs as part of the bond package for the deal because the debt service costs were significantly lower with QECBs than with tax-exempt general obligation bonds. The County estimates the savings over the life of the bonds to be around \$180,000.

Transportation, Mass Commuting and Vehicles – Commercial Fleets



Image: Randolph Trucking, Gaffney, SC. Source: South Carolina Jobs and Economic Development Authority at <http://www.scjeda.com/randolph-trucking-utilizes-sc-energy-conservation-financing-programs/>

Randolph Trucking/South Carolina SAVES, South Carolina

In June 2014, the South Carolina SAVES Green Community Program issued \$2 million of QECBs to assist in financing the acquisition of 10 compressed natural gas (“CNG”) vehicles for Randolph Trucking, LLC of Gaffney, South Carolina. The Business Development Corporation of South Carolina issued the bonds as part of the SC SAVES Green Community Program. SC SAVES was established to provide low cost financing to South Carolina governmental, institutional, and commercial and industrial properties. Qualified conservation measures that may be financed include: lighting, heating/ventilation and air conditioning (HVAC), controls, envelope, process improvement upgrades, solar photovoltaic systems, and Liquefied Natural Gas (LNG)/CNG or propane fleet conversions.

The purchase of the 10 CNG trucks was the first step in Randolph Trucking’s plan to convert its entire diesel fleet to CNG vehicles. With these 10 trucks in operation, Randolph expects to displace consumption of 158,000 gallons of diesel fuel annually with CNG fuel. This change is expected to save close to 50% a year in fuel costs for the company and reduce GHG emissions by the equivalent of 640 metric tons annually which would equate to removing 135 cars from the road annually.

Utility-Scale EE, Renewables and Resilience – Streetlights



Image: Broad spectrum induction streetlight; Source: <http://www.sandiego.gov/environmental-services/energy/programs/projects/saving/broadspectrumretrofit.shtml>

San Diego, California

In 2011, the City of San Diego (the “City”) used their \$13.1M QECB allocation to replace the 39,000 sodium vapor streetlights (approximately 60% of the city’s lights) with broad-spectrum induction lighting.

At the time of issuance QECBs had yet to be used for streetlight conversions and such use was not explicitly laid out in the QECB legislation (16 U.S. Code § 54D) and were unable to obtain assurances from Treasury blessing the City’s planned issuance. The City mitigated the risk of loss of subsidy by structuring the project economics so that even if this was not a QECB eligible project they would still have a cost-effective project without the QECB subsidy. Subsequent to the issuance the Treasury issued guidance in Notice 2012-44 that clarified that streetlight upgrades were indeed an eligible use of QECBs under the Green Community Program designation and this removed any uncertainty surrounding the subsidy.

The QECBs were sold as a private placement to Bank of America. The QECBs were designated equipment lease-purchase agreement, which meant that the underlying security for the bonds is the installed streetlights. While the City uses the streetlights, Bank of America as purchaser of the bonds technically owns the fixtures until the repayment of the bonds. The interest rate on the bonds was 6.16 percent but the QECB subsidy resulted in a net interest cost to the city of 2.88 percent.

The new broad-spectrum induction lights have an expected lifetime of 20 years (compared with a 4-5 year lifetime for the lights they replaced). The annual savings resulting from the project were estimated to be around \$2.2 million dollars with 16 million annual kilowatt-hours in energy savings, equal to the amount of energy used by 2,540 homes.

Utility-Scale Energy Efficiency, Renewables and Resilience – Water Meters



Example of a radio-read water meter similar to those to be installed by Silver City. Image courtesy of <http://www.cityofbrooklyncenter.org>

Silver City, New Mexico

On September 1, 2015, the Town of Silver City, New Mexico issued \$3,910,000 of Qualified Energy Conservation Bonds (QECCBs) for a Green Community Program (GCP). The GCP was established in order to replace the city's antiquated water meters – which required manual reading by city personnel – with newer, radio based meters. The QECCB proceeds were used for the acquisition and installation of these new meters which more accurately measure residents' water use and allow city personnel to simply “drive by” the meter to get a reading.

The new meters are expected to save the city money by ensuring customers are more accurately charged for the water they use. Over 65% of Silver City's water meters were over 15 years old. The new meters will catch more water that is going through the meter, enabling the city to bill the customer for water that previously would not have been properly measured.

The new meters also provide a 90-day snapshot (in 5 minute increments) of a resident's water use and this information will help the city inform residents about potential leaks and make them more aware of their water use, which in turn should help in water conservation efforts.

The net cost of financing to the city for the project was around 1%. The project was the first QECCB issued in the state of New Mexico.

For further details on this project see <http://financing.lbl.gov/reports/street-lighting-qecb.pdf>

Utility-Scale EE, Renewables and Resilience – Solar



Image: Mayberry Solar; Source: O2 Energies: <http://www.o2energies.com/new-page/>

Green Community Programs - North Carolina Agriculture Authority

In 2012, the North Carolina Agricultural Finance Authority (“the Authority”) established a green community program to promote the development of renewable energy resources on agricultural land in North Carolina. Developers with a project that meets the necessary criteria apply for loans funded by QECBs issued by the Authority.

A wide variety of projects are eligible for the program so long as the project has a nexus to agriculture. Eligible projects include: wind energy facilities, solar facilities, distributed generation initiatives, research facilities to support research into fossil fuel alternatives and demonstration projects that are designed to promote the commercialization of clean energy sources (such as the conversion of agricultural waste for use in the production of fuel.) The required nexus to agriculture exists if the project is located on land that is leased from an owner who is also using the land for agricultural purposes, or the pursuit of some form of agriculture on the same land, or use of agricultural products or by-products as part of green energy production.

The Authority issues QECBs from the State of North Carolina’s allocation on behalf of the project borrower. The Authority acts as a conduit issuer and loans the QECB issuance proceeds to the project borrower. The project borrower is responsible for the repayment of the funds and the bonds are not considered a debt of the state.

The Authority charges each participant a fee equal to 1% of the aggregate amount of the loan closed and the fee may be paid from loan proceeds. The participant must also pay the Authority’s fees and out-of-pocket expenses relating to the bonds and the project.

As of October 2015, four projects, all for solar installations on agricultural land, have been financed under this program:

Avery Solar, 3/20/12, \$1,977,702
Mayberry Solar, 5/15/12, \$2,215,000
Sandy Cross Solar, 8/29/12, \$1,200,000
Progress Solar 1, 2/6/13, \$2,100,000

The total value of QECBs issued under the program to date is \$7,492,702. The bonds were all sold in private placements.

Utility-Scale Energy Efficiency, Renewables and Resilience – Combined Heat and Power (CHP)



Atlanta Syrup Plant CHP facility, image courtesy Coca-Cola via <http://www.theguardian.com>

Development Authority of Fulton County, Georgia

In 2012, the Development Authority of Fulton County, Georgia issued \$16,934,000 of Qualified Energy Conservation Bonds (QECBs) to finance the construction of a 6.5-megawatt combined heat-and-power system to supply electricity, steam and chilled water to Coca-Cola's Atlanta Syrup plant. The project was developed and is owned and operated by MAS Energy (a renewable energy system developer and investor) and provides 100 percent of the plant's energy needs, completely offsetting the use of fossil fuels. Coca-Cola estimated that the system would reduce its carbon footprint by approximately 20,400 tons annually.

The project includes a vacuum-collection system that captures methane gas from a Georgia-based landfill. Methane, a greenhouse gas that is more than 20 times more potent than carbon dioxide, is naturally produced as organic waste breaks down anaerobically in landfills. The vacuum collection system converts this gas to clean-burning fuel and delivers it to the combined heat-and-power facility via a six-mile pipeline. The CHP plant then uses the gas as a primary fuel source to produce energy.

Utility-Scale EE, Renewables and Resilience – Solar



Adelanto Solar Project; image courtesy TTG Corp. via <http://www.ttgcorp.com/home/markets/ladwp-adelanto-solar-power-plant-2/>

Los Angeles Department of Water and Power -- Los Angeles, California

The Department of Water and Power of the City of Los Angeles (LADWP) utilized QECBs to finance three renewable energy facilities: the Pine Tree Wind Turbine Expansion, the Pine Tree Solar Project, and the Adelanto Solar Project.

LADWP issued \$131 million of revenue bond QECBs and \$8 million of Clean Renewable Energy Bonds (CREBs) on August 17, 2010. The issuance is the largest known QECB issuance to date. The proceeds were used to (1) expand an existing facility, the Pine Tree Wind Turbine facility, with the addition of ten 1.5 MW wind turbines; (2) build a new photovoltaic generator targeted at 10 MW with an output of 34.5 kv (the Pine Tree Solar Project); and (3) build another 10 MW photovoltaic generator with an output of 4.16 kv and generating 20 Gwh per year (the Adelanto Solar Project). LADWP installed, owns, and operates the Adelanto system.

The Adelanto system features several innovative design elements, including interconnection with a critical bulk-grid substation as well as a more efficient, 1,000-volt solar power system. The system also incorporates ground-mounted systems--solar panels held in place by racks or frames that are attached to ground-based mounting supports--to reduce site-preparation costs. According to experts, ground-mounted systems are best suited for utility-scale power or for an application where roof space is not available, and they can be oriented to capture more sunlight than rooftop solar panels.

Utility-Scale EE, Renewables and Resilience – Wind



Image: Swauk Creek wind turbines; source NREL: <http://images.nrel.gov/viewphoto.php?imageId=7381158>

Swauk Creek Ranch, Kittitas County, Washington

In December 2012, the Washington State Housing Finance Commission (WSHFC) issued \$9 million of QECBs to finance the development and construction of five wind turbines. The turbines are located on the privately owned Swauk Creek Ranch, a 3,865 reserve in Kittitas County, Washington and were developed in partnership with the Seattle-based energy and facility services firm McKinstry. The QECBs were issued as private activity bonds and were the first use of QECBs for private activity in Washington.

The project consisted of five Gamesa 850 kW G58 model wind turbines which were completed in early 2013. The five turbines are able to deliver 4.25 megawatts of electricity, enough to power more than 1,000 homes annually. The project is connected to the local grid to provide energy for local consumption and serves as a model for how to efficiently harness and keep resources within the community they reside. In addition, by connecting the turbines to the existing local power grid there was no need to expend resources on new, expensive transmission lines.

Utility-Scale Energy Efficiency, Renewables and Resilience – Waste-to-Energy



Image: Lebanon, TN gasification plant groundbreaking; source <http://www.districtenergy.org/blog/2015/11/20/lebanon-tn-waste-to-energy-plant-called-model-for-partnerships/>

Lebanon, Tennessee

On April 14, 2015, the city of Lebanon, Tennessee issued \$3,500,000 of QECBs to finance the construction of a Waste-to-Energy gasification plant. The project broke ground on November 17, 2015 and is situated adjacent to the city's wastewater treatment facility. The facility will process tens of thousands of tons of sewer sludge, used tires and industrial wood waste and convert it to electricity to help power the wastewater treatment facility as well as divert these materials from area landfills. It is anticipated that the plant will reduce annual electricity expenses by around \$235,000 and divert over 8,000 tons of material from landfills each year.

Gasification is a clean thermo-chemical process that breaks down biomass-based material in a high-heat and low-oxygen environment. There is no incineration or burning involved in the process and it is zero waste – around 95% of the waste that goes in to the plant comes out as fuel and the 5% residue that remains is a carbon biochar that has multiple agricultural, industrial and direct fuel uses. In Lebanon, the synthetic fuel gas produced by the gasification process will be used to power an generator, which will provide for the gasification operation's internal needs, and deliver up to 200 kW directly to the operation of the wastewater treatment plant.

The Tennessee Department of Environment and Conservation (TDEC) awarded the project \$250,000 through the Clean Tennessee Energy Grant program; the remainder of the costs were financed by the QECBs.

VIII. Tables and Charts

Table 1A: Qualified Energy Conservation Bonds Known Issued by State (as of July 31, 2016)

State	Amount	Known Issued	Percent Issued	Remaining
Alabama	\$48,364,000	\$39,325,325	81.31	\$9,038,674
Alaska	\$7,120,000	0	0.00	\$7,120,000
American Samoa	\$673,000	0	0.00	\$673,000
Arizona	\$67,436,000	\$24,650,379	36.55	\$42,785,621
Arkansas	\$29,623,000	\$10,710,000	36.15	\$18,913,000
California	\$381,329,000	\$313,853,250	82.31	\$67,475,750
Colorado	\$51,244,000	\$49,390,321	96.38	\$1,853,679
Connecticut	\$36,323,000	\$10,700,000	29.46	\$25,623,000
Delaware	\$9,058,000	0	0.00	\$9,058,000
District of Columbia	\$6,140,000	0	0.00	\$6,140,000
Florida	\$190,146,000	0	0.00	\$190,146,000
Georgia	\$100,484,000	\$26,476,000	29.33	\$71,008,000
Guam	\$1,826,000	0	0.00	\$1,826,000
Hawaii	\$13,364,000	0	0.00	\$13,364,000
Idaho	\$15,809,000	0	0.00	\$15,809,000
Illinois	\$133,846,000	\$91,660,000	68.48	\$42,186,000
Indiana	\$66,155,000	\$23,700,000	35.82	\$42,455,000
Iowa	\$31,150,000	0	0.00	\$31,150,000
Kansas	\$29,070,000	\$29,065,000	99.98	\$5,000
Kentucky	\$44,291,000	\$44,179,000	99.75	\$112,000
Louisiana	\$45,759,000	\$37,818,244	82.65	\$7,940,756
Maine	\$13,657,000	\$4,097,100	30.00	\$9,559,900
Maryland	\$58,445,000	\$10,665,000	18.25	\$47,780,000
Massachusetts	\$67,413,000	\$36,303,237	53.85	\$31,109,763
Michigan	\$103,780,000	\$25,675,544	24.74	\$78,104,456
Minnesota	\$54,159,000	\$39,321,151	72.60	\$14,837,849
Mississippi	\$30,486,000	0	0.00	\$30,486,000
Missouri	\$61,329,000	\$16,346,430	26.65	\$44,982,570
Montana	\$10,037,000	\$8,334,000	83.03	\$1,703,000
Nebraska	\$18,502,000	\$18,200,000	98.37	\$302,000
Nevada	\$26,975,000	\$8,135,950	30.16	\$18,839,050
New Hampshire	\$13,651,000	\$1,129,348	8.27	\$12,521,652
New Jersey	\$90,078,000	0	0.00	\$90,078,000
New Mexico	\$20,587,000	\$3,905,000	18.97	\$16,682,000
New York	\$202,200,000	\$41,803,206	20.67	\$160,396,784
North Carolina	\$95,677,000	\$7,492,702	7.83	\$88,184,298
North Dakota	\$6,655,000	\$3,780,000	56.80	\$2,875,000
Northern Marianas	\$899,000	0	0.00	\$899,000
Ohio	\$119,160,000	\$81,256,888	68.19	\$37,903,112
Oklahoma	\$37,787,000	0	0.00	\$37,787,000

Oregon	\$39,320,000	\$9,680,000	24.62	\$29,640,000
Pennsylvania	\$129,144,000	\$41,835,000	32.39	\$87,309,000
Puerto Rico	\$41,021,000	0	0.00	\$41,021,000
Rhode Island	\$10,901,000	0	0.00	\$10,901,000
South Carolina	\$46,475,000	\$12,512,000	26.92	\$33,963,000
South Dakota	\$8,343,000	\$6,575,000	78.81	\$1,768,000
Tennessee	\$64,476,000	\$34,302,000	53.20	\$30,174,000
Texas	\$252,378,000	\$37,696,508	14.94	\$214,681,492
US Virgin Islands	\$1,140,000	0	0.00	\$1,140,000
Utah	\$28,389,000	\$6,918,774	24.37	\$21,470,226
Vermont	\$6,445,000	0	0.00	\$6,445,000
Virginia	\$80,600,000	\$18,201,000	22.58	\$62,399,000
Washington	\$67,944,000	\$43,550,000	64.10	\$24,394,000
West Virginia	\$18,824,000	0	0.00	\$18,824,000
Wisconsin	\$58,387,000	\$31,182,883	53.41	\$27,204,117
Wyoming	\$5,526,000	0	0.00	\$5,526,000
Total	\$3,200,000,000	\$1,257,544,540	39.30	\$1,942,455,660

1. The information attached hereto has been gathered from various sources, including IRS Notice 2009-29, Municipal Securities Rulemaking Board, Department of Energy (DOE), Wells Fargo, state and local issuer websites, state and local government contacts. The amount issued figure may be rounded.

2. Chart compiled by Elizabeth Bellis, Director, QECB Program, and Susan Rosenthal, EPC, and funded by the Energy Foundation, Ford Foundation, and others. Chart includes all known QECB issuances through July 31, 2016 but may not include all QECB issuances.

For more information, please contact Elizabeth Bellis at ebellis@energyprograms.org or Susan Rosenthal at srosenthal@energyprograms.org.

Table 1B: Qualified Energy Conservation Bonds Known Issued by State (as of July 31, 2016)

Issuer	State	Issue Date	Amount Issued	Use of Proceeds
Montgomery County Commission	Alabama	6/30/14	\$4,350,986	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - youth detention facility
City of Trussville	Alabama	4/20/14	\$2,485,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - parks and recreation (lighting, sports complex)
Montgomery County Commission	Alabama	3/9/12	\$4,416,936	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Scottsboro- City	Alabama	11/29/12	\$5,750,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
City of Foley	Alabama	1/30/13	\$2,900,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
City of Vestavia Hills	Alabama	5/15/13	\$4,245,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - parks and recreation (lighting, sports complex)
Madison County Board of Education	Alabama	11/18/13	\$5,647,153	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Madison County Board of Education	Alabama	7/3/13	\$9,530,250	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Tempe	Arizona	7/1/11	\$7,300,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Tucson City	Arizona	6/9/11	\$1,430,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Tucson City	Arizona	6/23/10	\$5,590,000	Renewable generation - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Navajo County/City of Show Lo	Arizona	1/3/12	\$723,804	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Lake Havasu City	Arizona	??/11	\$3,203,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Lake Havasu City	Arizona	??/12	\$2,000,000	Renewable generation - Utility-Scale EE, Renewables and Resilience - Solar
Casa Grande	Arizona	2/1/12	\$2,787,000	Renewable generation - Solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Mayer USD	Arizona	??/12	\$636,575	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Somerton	Arizona	11/22/11	\$980,000	Renewable generation - Solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities

Arkansas Development Finance Authority/Osceola County School District	Arkansas	5/11/15	\$1,585,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Arkansas Development Finance Authority	Arkansas	5/23/13	\$4,630,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Arkansas Development Finance Authority/Osceola County School District	Arkansas	11/1/13	\$4,495,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
GreenFinanceSF (City and County of San Francisco)	California	Oct-12	\$1,400,000	GCP - EE/renewable generation- Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - Large Commercial (C-PACE)
Yuba College Central Plant Efficiency Project	California	6/3/11	\$6,324,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - University
Yuba Community College	California	6/21/11	\$15,040,000	Renewable generation - Solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - University
Richmond	California	12/1/10	\$1,070,000	GCP - Utility Scale EE, Renewables and Resilience - Streetlights
San Diego	California	4/15/11	\$13,141,596	GCP - Utility Scale EE, Renewables and Resilience - Streetlights
Santa Clara County Photovoltaic Project	California	2/10/11	\$20,368,000	Renewable generation - Solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Sonoma County	California	8/6/10	\$1,977,500	Renewable generation - Solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Kern County	California	4/12/11	\$4,337,131	Renewable generation - Solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Yolo County	California	3/16/11	\$2,019,214	Renewable generation - Solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - prison/detention facilities
Santa Barbara County	California	5/25/11	\$4,170,000	Renewable generation - Solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Los Angeles County	California	8/31/11	\$14,000,000	Renewable generation - Solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
City of Los Angeles	California	10/25/11	\$11,920,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
San Francisco County	California	10/1/11	\$8,291,079	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Irvine Unified School District	California	7/29/10	\$4,840,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Lodi Unified School District Project	California	11/18/10	\$9,915,000	Renewable generation - solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools

Oxnard Union High School District Project	California	9/29/10	\$19,067,730	Renewable generation - solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities – schools
Los Angeles Dep't of Water & Power	California	6/4/13	\$27,855,000	EE - Utility-Scale EE, Renewables and Resilience
Los Angeles Dep't of Water & Power	California	8/17/10	\$131,020,000	Renewable generation - Utility-Scale EE, Renewables and Resilience - solar/wind
Fallbrook Public Utility District Project	California	11/18/10	\$7,227,000	Renewable generation - Utility-Scale EE, Renewables and Resilience - solar
Rancho Water District Financing Authority	California	11/7/11	\$9,870,000	Renewable generation - Renewable generation - Utility-Scale EE, Renewables and Resilience - solar/wastewater system EE
Regents of the University of Colorado	Colorado	10/20/10	\$4,375,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities – university
Western State College	Colorado	8/19/10	\$1,635,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities – university
Colorado School of Mines	Colorado	4/12/11	\$2,800,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities – university
Boulder Housing Partners	Colorado	8/25/10	\$1,443,881	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience -multifamily residential/municipal facilities (public housing)
Roaring Fork Transportation Authority	Colorado	8/21/12	\$6,650,000	GCP - Transportation, Mass Commuting & Vehicles - Commuter Buses
Roaring Fork Transportation Authority	Colorado	11/21/13	\$1,300,000	GCP - Transportation, Mass Commuting & Vehicles - Commuter Buses
Boulder County PACE	Colorado	11/5/10	\$1,515,000	GCP - EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - Large Commercial/Small Commercial/Multifamily residential/industrial (C-PACE)
Boulder County	Colorado	2/2/10	\$5,800,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
City of Boulder	Colorado	9/27/10	\$1,500,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - municipal buildings
City of Englewood	Colorado	9/15/10	\$1,286,440	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Foothills Park & Rec Dt	Colorado	8/13/10	\$1,000,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - parks and recreation
Fort Collins City	Colorado	6/28/10	\$6,410,000	EE - Utility Scale EE, Renewables & Resilience - Smart Grid
Colorado Housing Finance Authority (private issuance)	Colorado	4/20/12	\$6,775,000	Renewable generation - solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities/multifamily residential (public housing)
Colorado Housing Finance Authority (private issuance)	Colorado	8/30/13	\$4,900,000	Renewable generation - solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities

Mesa County School District #51	Colorado	10/29/10	\$2,000,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
East Hartford	Connecticut	4/10/10	\$6,000,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Waterbury City	Connecticut	8/11/10	\$4,700,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Development Authority of Fulton County/MAS ASB Cogen, LLC Project	Georgia	5/11/12	\$16,934,000	Renewable generation - CHP - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - Industrial
Fulton County	Georgia	8/23/11	\$5,372,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Brunswick and Glynn County Development Authority	Georgia	4/16/15	\$7,170,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Southern Illinois Univ Bd of Trustees	Illinois	12/6/12	\$5,365,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Illinois Central College / Tazewell County	Illinois	3/13/14	\$1,300,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Cook County	Illinois	7/23/13	\$24,945,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
City of Chicago	Illinois	11/4/10	\$29,665,000	EE - Utility-Scale EE, Renewables and Resilience - wastewater system EE
Deerfield	Illinois	9/26/11	\$12,500,000	EE - Utility-Scale EE, Renewables and Resilience - wastewater system EE
Champaign Cty (Rantoul) Township High School District 193	Illinois	12/20/10	\$120,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
McHenry CCSD	Illinois	8/31/11	\$1,500,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Champaign Cty School District 116 (Urbana)	Illinois	12/14/10	\$585,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Village of Bensenville	Illinois	11/18/14	\$6,815,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
School District Number 129 Kane County (Aurora West)	Illinois	10/14/15	\$4,856,000	Renewable Generation - Geothermal - Building Level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Metropolitan Water Reclamation District of Greater Chicago	Illinois	6/7/16	\$4,000,000	EE - Utility-Scale EE, Renewables and Resilience - wastewater system EE
Ivy Technical Community College	Indiana	10/1/10	\$3,300,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Knox County	Indiana	4/12/12	\$16,200,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities

City of South Bend	Indiana	5/1/15	\$4,200,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Kansas Development Finance Authority	Kansas	12/21/10	\$17,815,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Wyandotte County/Kansas City Unified Govt.	Kansas	11/18/10	\$2,530,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Lawrence City	Kansas	3/10/11	\$8,720,000	Renewable generation - Utility-Scale EE, Renewables and Resilience - Hydroelectric
University of Kentucky	Kentucky	11/19/10	\$12,955,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
University of Louisville	Kentucky	12/20/10	\$20,942,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Louisville-Jefferson County Metro Govt.	Kentucky	9/14/10	\$7,400,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Lexington/Fayette Urban County Government	Kentucky	12/16/14	\$2,900,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - correctional facility
Department of Corrections	Louisiana	12/15/11	\$30,318,244	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - correctional facility
Orleans Parish/Louisiana Stadium and Exposition District	Louisiana	12/15	\$7,500,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities (sports stadiums and related facilities)
Portland Housing Authority, Portland	Maine	6/7/13	\$4,097,100	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - multifamily residential/municipal facilities (public housing)
Montgomery County	Maryland	10/3/13	\$4,165,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
State of Maryland - St. Mary's County Public schools - Leonardtown Middle School	Maryland	7/27/11	\$6,500,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Belchertown	Massachusetts	9/20/11	\$3,140,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Georgetown	Massachusetts	10/18/12	\$2,199,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Lowell City	Massachusetts	12/2/11	\$2,648,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
South Hadley	Massachusetts	12/18/13	\$1,901,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
City of Northampton	Massachusetts	12/22/10	\$1,698,790	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities

Town of Gill	Massachusetts	8/25/11	\$127,500	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Town of Marshfield	Massachusetts	7/2/12	\$5,000,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Lancaster Town	Massachusetts	9/18/12	\$1,484,000	Renewable Generation - Utility Scale EE, Renewables & Resilience - wind
Cathartes Private Investments/ Westford Solar	Massachusetts	8/22/11	\$5,800,000	Renewable Generation - Utility Scale EE, Renewables & Resilience - wind
Fairhaven Wind	Massachusetts	11/7/11	\$3,035,957	Renewable Generation - Utility Scale EE, Renewables & Resilience - wind
Scituate Wind/Town of Scituate	Massachusetts	8/10/11	\$1,531,480	Renewable Generation - Utility Scale EE, Renewables & Resilience - wind
Pentucket Regional School District	Massachusetts	10/21/11	\$4,567,510	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Town of Ashland	Massachusetts	4/1/15	\$3,170,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Genesee County	Michigan		\$7,815,784	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Osceola County	Michigan		\$650,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Saginaw	Michigan	12/20/10	\$2,088,779	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
City of Greenville	Michigan		\$800,000	
Ottawa County	Michigan		\$2,825,981	
Grant Schools	Michigan		\$995,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities- schools
Monroe County	Michigan	6/6/14	\$10,500,000	EE - Utility-Scale EE, Renewables and Resilience - wastewater system EE
New Hope Economic Development Authority	Minnesota	11/18/11	\$3,505,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Washington County Housing and Redevelopment Authority	Minnesota	2/22/12	\$2,375,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - multifamily residential/municipal facilities (public housing)
Grant County	Minnesota	2/1/11	\$2,000,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Gilbert City	Minnesota	6/24/12	\$350,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Goodhue County	Minnesota	8/16/12	\$1,295,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Itasca County	Minnesota	2/8/11	\$3,690,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities

ELY ISD #696	Minnesota	5/19/11	\$2,810,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Metropolitan Airports Commission	Minnesota	10/3/14	\$23,296,151	Renewable generation - Utility-Scale EE, Renewables and Resilience - solar (airport)
Greene County	Missouri	3/3/11	\$1,130,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
St. Louis County	Missouri	4/29/11	\$10,305,000	GCP - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - Single Family Residential (Loan Program)
Missouri Clean Energy Program/Wornall Plaza Condominiums	Missouri	11/6/14	\$571,430	GCP - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - multifamily residential (CPACE)
Missouri Clean Energy District/Otterville Wastewater Improvement	Missouri	4/30/15	\$705,000	GCP - Utility-Scale EE, Renewables and Resilience - wastewater system EE
St. Louis Municipal Finance Corporation	Missouri	5/4/16	\$3,635,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Billings High SD #2	Montana	7/12/12	\$3,780,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Billings SD #2	Montana	7/12/12	\$4,554,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
University of Nebraska	Nebraska	4/1/14	\$4,325,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Nebraska Utilities Corp	Nebraska	2/6/14	\$5,500,000	Renewable generation -Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities- University
Nebraska Utilities Corp	Nebraska	2/1/14	\$6,500,000	Renewable generation - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - University
University of Nebraska Facilities Corporation	Nebraska	1/15/15	\$1,875,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - University
City of Reno	Nevada	6/1/10	\$2,261,650	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Las Vegas	Nevada	3/16/11	\$5,874,300	GCP - Utility-Scale EE, Renewables and Resilience - Streetlights/EE -Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Manchester	New Hampshire	11/1/10	\$1,129,348	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
New Hampshire Business Finance Authority/Jericho Wind	New Hampshire	12/1/14	\$4,095,300	Renewable Generation - Utility Scale EE, Renewables & Resilience - wind
Silver City	New Mexico	10/6/15	\$3,905,000	GCP - Utility-Scale EE, Renewables and Resilience - water meters

Albany Co - New York	New York	12/27/12	\$1,600,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Rochester City	New York	6/16/10	\$2,166,400	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Chautauqua County	New York	1/19/11	\$1,403,470	Renewable generation - Utility-Scale EE, Renewables and Resilience - waste-to-energy
NYSERDA	New York	8/13/13	\$24,300,000	GCP - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - single family residential/multifamily residential (loan program)
Town of Hempstead	New York	8/7/12	\$4,894,340	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Wayne County	New York	12/16/15	\$2,920,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Onondaga County	New York	12/11/15	\$2,650,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Oneida County	New York	12/11/15	\$1,845,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Energize NY/Town of North Salem	New York	1/15/16	\$23,997	GCP - EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - multifamily housing (PACE, Affordable Housing)
Avery Solar	North Carolina	3/20/12	\$1,977,702	GCP - Renewable Generation - Utility Scale EE, Renewables & Resilience - solar
Mayberry Solar	North Carolina	5/15/12	\$2,215,000	GCP - Renewable Generation - Utility Scale EE, Renewables & Resilience - solar
Sandy Cross Solar	North Carolina	8/29/12	\$1,200,000	GCP - Renewable Generation - Utility Scale EE, Renewables & Resilience - solar
Progress Solar I	North Carolina	2/6/13	\$2,100,000	GCP - Renewable Generation - Utility Scale EE, Renewables & Resilience - solar
Morton County (Mandan S.D.)	North Dakota	2/9/2011; 5/4/2011	\$3,780,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Ohio University	Ohio	8/1/12	\$8,500,000	EE/Renewable Generation - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university (includes solar)
University of Akron	Ohio	9/30/13	\$15,000,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Kent State University (Main Campus)	Ohio	5/31/11	\$7,000,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Kent State University (Regional Campus)	Ohio	3/30/11	\$2,693,612	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Kent State University (Stark Campus)	Ohio	6/11/10	\$672,130	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Owens State Community College	Ohio	3/18/10	\$3,125,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university

Kent State University	Ohio	10/25/12	\$7,500,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Ohio State University	Ohio	12/20/12	\$2,340,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Wright State University	Ohio	2/28/13	\$8,312,700	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Central State University	Ohio	5/16/13	\$7,000,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
City of South Euclid	Ohio	8/31/11	\$386,145	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
City of Trotwood	Ohio	4/12/12	\$883,361	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Jefferson County	Ohio	5/12/12	\$658,040	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
City of Akron	Ohio	8/15/13	\$2,355,914	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Franklin County	Ohio	5/23/13	\$3,806,167	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Licking County	Ohio	11/20/12	\$796,252	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Findlay	Ohio	6/30/11	\$518,010	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Hamilton County	Ohio	10/22/11	\$2,063,750	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Licking County	Ohio	9/29/11	\$2,121,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Pickaway County	Ohio	12/15/10	\$1,479,807	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
City of Cincinnati	Ohio	8/20/15	\$3,450,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Williams Co (Edgerton) LSD	Ohio	2/23/12	\$595,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Gresham County	Oregon	7/30/13	\$7,600,000	Renewable Generation - Utility Scale EE, Renewables & Resilience – wind
State of Oregon	Oregon	6/26/14	\$2,080,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Philadelphia Municipal Authority	Pennsylvania	5/11/12	\$6,250,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Allegheny County	Pennsylvania	11/22/10	\$9,385,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Fayette County	Pennsylvania	9/28/11	\$1,490,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities

York County	Pennsylvania	12/28/11	\$2,200,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Commonwealth of PA Department of Corrections	Pennsylvania	9/30/10	\$15,810,000	EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - correctional facilities
Tri-Valley School District	Pennsylvania	12/30/13	\$1,500,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Lancaster County	Pennsylvania	8/7/13	\$5,200,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
SC Saves/Anderson School District 3	South Carolina	3/19/15	\$5,250,000	GCP - EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
SC Saves/Randolph Trucking	South Carolina	5/24/14	\$2,000,000	GCP - Transportation, Mass Commuting & Vehicles - Commercial Fleets (CNG/Electric)
SC Saves/Sumter County	South Carolina	12/15/15	\$5,262,000	GCP - EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Rapid City	South Dakota	11/1/11	\$4,000,000	Renewable generation - solar - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Lake County	South Dakota	6/1/11	\$850,000	Renewable generation - geothermal - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Davison County (Mitchell) #17-2	South Dakota	11/10/10	\$1,725,000	Renewable generation - wind - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Nashville and Davidson County	Tennessee	8/15/12	\$6,440,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Memphis - Memphis Green Communities Program - Sears Crosstown	Tennessee	2/18/15	\$8,316,000	GCP - EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - large commercial (historic building redevelopment)
Memphis - Memphis Green Communities Program - Universal Life Insurance Building	Tennessee	4/29/15	\$2,015,300	GCP - EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - large commercial (historic building redevelopment)
Memphis - Memphis Green Communities Program - Knowledge Quest	Tennessee	4/29/15	\$340,700	GCP - EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - multifamily residential (residences for urban farmers)
City of Lebanon	Tennessee	4/1/15	\$3,500,000	Renewable generation - Utility-Scale EE, Renewables and Resilience - waste-to-energy
Knox County	Tennessee	6/30/15	\$12,450,000	Renewable generation - Utility-Scale EE, Renewables and Resilience - solar
City of Clarksville	Tennessee	4/6/15	\$1,240,000	GCP - Utility Scale EE, Renewables and Resilience - Streetlights
City of Houston	Texas	7/1/14	\$9,000,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities

Hamshire-Fannet ISD	Texas	7/1/14	\$2,608,093	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Edgewood ISD (San Antonio)	Texas	9/1/15	\$14,067,032	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Sweeny ISD (Brazoria County)	Texas	1/1/15	\$2,000,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
City of Wharton	Texas	11/12/15	\$1,596,383	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities (equipment lease purchase)
City of Bowie	Texas	10/5/15	\$4,100,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Hearne ISD	Texas	11/18/15	\$1,525,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities – schools
City of Smithville	Texas	12/22/15	\$2,800,000	GCP - Utility Scale EE, Renewables and Resilience – Utility Meters (water and electric)
Utah County	Utah	10/22/10	\$5,000,970	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Salt Lake County	Utah	7/12/11	\$1,917,804	Renewable generation -Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Norfolk	Virginia	11/7/13	\$2,470,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Spotsylvania County	Virginia	7/19/12	\$1,240,000	Mass Commuting - Transportation, mass commuting and vehicles - commuter rail and stations
VirginiaSAVES	Virginia	1/1/16	\$2,500,000	GCP - EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - commercial (private school)
VirginiaSAVES	Virginia	2/1/16	\$3,300,000	GCP - EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities – schools
VirginiaSAVES (Warren County Schools)	Virginia	2/16	\$8,691,000	GCP - EE - ESPC - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities – schools
Washington State Housing Finance Commission	Washington	3/6/14	\$1,150,000	GCP - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - Small Commercial
Kitsap County	Washington	12/16/10	\$1,110,000	EE - Utility-Scale EE, Renewables and Resilience - wastewater system EE
Bellingham City	Washington	4/13/11	\$6,480,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
King Co- Washington	Washington	12/10/12	\$6,020,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Yakima County	Washington	9/8/10	\$2,430,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
King County	Washington	11/15/10	\$5,825,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Renton	Washington	7/1/13	\$3,200,000	GCP - Utility Scale EE, Renewables and Resilience – Streetlights
Mason County	Washington	12/10/13	\$1,620,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - correctional facility

Okanogan County	Washington	9/5/13	\$1,115,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Thurston County	Washington	10/26/10	\$2,040,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Longview	Washington	4/18/13	\$3,560,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Swauk Creek Ranch (WSHFC Private Issuance)	Washington	12/27/12	\$9,000,000	Renewable Generation - Utility Scale EE, Renewables & Resilience – wind
Western Wisconsin Tech College Dt	Wisconsin	1/27/11	\$1,500,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Western Wisconsin Tech College Dt	Wisconsin	7/27/11	\$1,200,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - university
Western Wisconsin Tech College Dt	Wisconsin	7/21/10	\$1,500,000	Public Education Campaign
Pleasant Prairie Village	Wisconsin	8/16/10	\$1,890,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Jefferson School District	Wisconsin	3/18/11	\$2,345,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Racine Unified School District	Wisconsin	6/10/13	\$2,020,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities
Alma Center-Humbird-Merillan School District	Wisconsin	8/18/11	\$4,600,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Osh Kosh School District	Wisconsin	1/26/11	\$1,817,883	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Osseo Fairchild School District	Wisconsin	11/1/11	\$750,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Rock Co (Beloit) SD	Wisconsin	8/28/12	\$2,215,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Menasha School Dist. (Winnebago County)	Wisconsin	6/28/11	\$1,690,000	EE - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities - schools
Dane Co (Mount Horeb) ASD	Wisconsin	4/18/11	\$2,500,000	Renewable generation - Geothermal - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities- schools
School Dist Hartford No. 1 (Dodge and Washington Counties)	Wisconsin	4/11/11	\$2,295,000	Renewable generation - Geothermal - Building-level Energy Efficiency, Water Efficiency, Renewables and Resilience - municipal facilities- schools
Milwaukee County	Wisconsin	11/12/15	\$4,860,000	Transportation, Mass Commuting & Vehicles - Commuter Buses
Total			\$1,257,544,540	

Note: Abbreviation “EE” is energy efficiency, “GCP” is Green Community Program and “ESPC” is Energy Saving Performance Contract