



## CLEAN ENERGY FINANCING POLICY BRIEF

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## Using Qualified Energy Conservation Bonds for Public Building Upgrades: Reducing Energy Bills in the City of Philadelphia

Qualified Energy Conservation Bonds (QEBCs) are federally-subsidized bonds that enable state, tribal, and local government issuers to borrow money to fund a range of energy conservation projects, including public building upgrades that reduce energy use by at least 20 percent, at very attractive borrowing rates and long terms. As part of the American Recovery and Reinvestment Act (ARRA), the City of Philadelphia received a \$15 million QEBC award from the U.S. Department of the Treasury (Treasury). The city leveraged \$6.25 million of its QEBC allocation to finance half of a \$12.6 million initiative to upgrade the energy efficiency of City buildings. The upgrades to four city facilities are expected to deliver over \$10 million of net savings, and are a major step towards achieving the city's goal of reducing government energy consumption by 30 percent by 2015.

### QEBC Basics

A Qualified Energy Conservation Bond (QEBC) is a bond that enables qualified state, tribal and local government issuers to borrow money at attractive rates to fund qualified energy conservation projects.<sup>1</sup> QEBCs were initially established by the Energy Improvement and Extension Act of 2008 and issuance capacity was expanded from \$800 million to \$3.2 billion by ARRA. It is estimated that approximately 20 percent of this issuance capacity has been used,<sup>2</sup> leaving approximately \$2.5 billion available to state, local and tribal governments. A QEBC is among the lowest-cost public financing tools because Treasury subsidizes the issuer's borrowing costs. Issuers may choose between structuring QEBCs as tax credit bonds (i.e., bond investors receive federal tax credits in lieu of—or in addition to—interest payments) or as direct subsidy bonds (i.e., bond issuers receive cash rebates from the Treasury to subsidize their interest payments). Both tax credit and direct payment bonds subsidize borrowing costs; thus far, most QEBCs have been issued as direct subsidy bonds due to lack of investor appetite for tax credit bonds.

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*This paper is part of the LBNL Clean Energy Financing Policy Brief series. These working papers highlight emerging financing models, important issues that financing programs face, and how these issues are being addressed. To join the email list to receive these policy briefs, please click [HERE](#). The work described in this Policy Brief was funded by the Department of Energy Office of Energy Efficiency and Renewable Energy, Weatherization and Intergovernmental Program under Contract No. DE-AC02-05CH11231. Please direct questions or comments to Mark Zimring ([mzimring@lbl.gov](mailto:mzimring@lbl.gov)). The information in this policy brief is for informational purposes only—potential issuers should consult the U.S. Department of Treasury's QEBC guidance and their bond counsels.*

<sup>1</sup> A full list of eligible projects available here: <http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/QEBC.html>

<sup>2</sup> Overview of QEBC issuances available here: [http://www.energyprograms.org/wp-content/uploads/2012/03/QEBC\\_Memo\\_6-8-2.pdf](http://www.energyprograms.org/wp-content/uploads/2012/03/QEBC_Memo_6-8-2.pdf)

## Upgrading Buildings to Achieve Philadelphia's Ambitious Energy Reduction Targets

In 2009, Philadelphia launched *Greenworks*, a comprehensive sustainability strategy targeted at making the city “the greenest city in America” by 2015.<sup>3</sup> The plan includes a goal to reduce overall City government energy consumption by 30 percent from 2009 levels by 2015. By 2011, the city had reduced its energy use by 4.9 percent and saved approximately \$4 million, primarily through reduced vehicle fuel use and lighting upgrades in city facilities. *Greenworks* identified energy savings performance contracting (ESPC) as a tool that had potential to reduce the barriers to further energy savings in city-owned facilities.<sup>4</sup> These barriers included the City’s capital constraints and its public works contract bidding process. This bidding process typically involves four separate contracts on major contracts (general contractor, mechanical, electrical, plumbing), and City staff found that completing projects through performance contracting would avoid this multiple-contract process. Instead of conducting four separate bids, Philadelphia could use performance contracting to bid out a single design/build contract for an energy services company (ESCO) as allowable under the state’s Guaranteed Energy Savings Act.<sup>5</sup> In addition to reducing project contracting complexity, Adam Agalloco, a project manager in the Mayor’s Office of Sustainability (MOS), noted that, “having your engineer and contractor be the same entity is an incredibly effective way to complete energy efficiency upgrades as it creates better alignment between project engineers and the construction team.” Performance contracting also offered the City the opportunity to overcome budget constraints because ESCO-guaranteed energy savings limit the City’s general fund risk in the event that expected project savings do not materialize.

### Moving from Project Design to Implementation

After almost three years of planning, in spring 2012, MOS began implementing Philadelphia’s first ESPC (for the full value of the city’s expected energy savings. NORESO was contracted to perform energy efficiency upgrades (including lighting system replacements, control system upgrades and water conservation improvements) to the four largest city-owned downtown buildings, including City Hall and the City’s courthouse. Over the life of the 15 year ESPC, the energy improvements are expected to yield net energy savings of more than \$10 million (including an estimated \$350,000 positive cash flow in 2014 when the project is completed).<sup>6,7</sup>

### Deploying QECBs to Support the Project

In May 2012, the Philadelphia Municipal Authority issued \$12.6 million revenue bonds to fund the up-front costs of the energy efficiency upgrades.<sup>8</sup> The issuance had two tranches, \$6.355 million of tax-

<sup>3</sup> For more information on the Greenworks Plan, visit: <http://www.phila.gov/green/greenworks/PDFs/GreenworksPlan002.pdf>

<sup>4</sup> An ESPC is an energy conservation project in which a third party energy services company (ESCO) is typically contracted to evaluate energy saving opportunities in buildings, implement energy conservation measures (ECMs) and guarantee the customer that energy savings will achieve a certain level (often this level entails energy savings exceeding the cost of the energy improvements).

<sup>5</sup> Additional information on the Guaranteed Energy Savings Act available here:  
<http://www.energyservicescoalition.org/chapters/PA/resources.htm>

<sup>6</sup> Expected energy savings over the 15 year period are not discounted for the time value of money.

<sup>7</sup> The city pays an annual measurement & verification (M&V) fee to NORESO of approximately \$50 thousand and received a guarantee for the full cost of all predicted energy savings in the four buildings. The City may choose to stop making these payments if it gets comfortable in future years that the expected energy savings stream from the project is materializing (the guarantee would no longer be valid once M&V is halted).

<sup>8</sup> Municipal authorities are special-purpose government authorities unique to the state of Pennsylvania. These authorities are typically used to finance capital projects for cities, counties and school districts.

exempt 10 year bonds (Series A) and \$6.25 million of taxable 15 year QECBs (Series B) resulting in a net interest cost (net of Federal subsidy) of 2.31% for the bonds. Only \$6.25 million of the city's \$15 million QECB allocation was used for the project because the City was originally concerned that while, on average, the project would yield at least 20 percent savings in the four buildings being retrofitted, the expected savings in two of the buildings was just below 20 percent (two buildings were expected to yield savings of around 18 percent while two buildings were expected to save at least 24 percent).

Subsequently, in June 2012, the Treasury and the Internal Revenue Service issued new guidance which clarified that the minimum 20 percent savings threshold can be measured across a portfolio of buildings (e.g. average savings of 20 percent of energy use across multiple retrofitted buildings).<sup>9</sup>

The bonds were structured as a public issuance (as opposed to a private transaction), which necessitated attaining a bond rating—A2 by Moody's (the same as the City's General Obligation rating).

Philadelphia's finance team chose this route because it provided substantially lower costs of capital versus a private issuance, especially as it allowed the City to realize process efficiencies with public transactions already in progress. Issuance costs were 1.9 percent (\$242,497). Technically, the bonds are structured as revenue bonds (e.g. they are not secured by a general obligation of the City of Philadelphia)—the revenue stream is a service agreement between the city and the authority. However, in practice, because the city agrees to appropriate sufficient funding to make service agreement payments each year, investors and the rating agencies view these bonds as having the same security as general obligation bonds. Appropriation debt is common in municipal finance,<sup>10</sup> however, the strength of Philadelphia's appropriation pledge relative to the general obligation is quite rare – typically, appropriations debt is rated at least one notch lower than the GO.

## Future ESPC and QECB Plans

Because it was the first time the City was pursuing the ESPC model, to develop and approve the project took fairly significant effort within the City. Agalloco suggested the effort was split between approximately 1/3 FTE for a project manager, 1/4 FTE from the City's Law Department and varying levels of support from other City agencies in a number of different capacities (Department of Public Property, City Treasurer's Office, Office of Transportation and Utilities). In addition to the City staff, several small consulting contracts were used (all-in city project planning costs were estimated at less than "a couple hundred thousand dollars").<sup>11</sup> Future projects are likely to be easier to complete as the city has put in place the requisite policies (including the creation of a new Philadelphia Energy Authority) and City agencies are now far more familiar with both ESPCs and QECBs.<sup>12</sup> In total project development took approximately two years, but with this additional experience the City believes it could complete future project development in 1.5 years. However, given the multistep process and the number City departments involved in shaping the scope and financing (e.g. Department of Public Property, Law Department, Finance Office, Treasurers Office) in addition to the approvals needed, the project timeline is difficult to compress.

<sup>9</sup> Overview of this guidance available here: <http://financing.lbl.gov/reports/phil-statement.pdf>. Full guidance available here: <http://www.irs.gov/pub/irs-drop/n-12-44.pdf>

<sup>10</sup> Appropriate debt is typically issued because a city's general fund is capacity-constrained or the debt is being used to fund a specialized project that requires an outside bonding authority.

<sup>11</sup> Consultants were used primarily to determine expected energy cost escalation rates, vet the project ECMs, develop the Measurement and Verification program and to compare the pricing. The City's finance department was concerned about ensuring that future utility cost estimates were accurate and conservative (as these influence the size and value of the performance guarantee).

<sup>12</sup> Agalloco expects that future projects will take approximately 2 years from initial RFQ/RFP to implementation.

With an ESPC under their belt and additional QECB guidance in hand, the MOS and City are scoping additional ESPC projects that could be funded with the city's remaining QECB allocation. City staff are also considering altering their RFP process for future issuances to include "open book bidding" that provides more clarity on contractor profit margins in the hopes that they'll be able to deliver even greater savings to city taxpayers.

### Other QECB Issuances for Public Building Energy Improvements

Over 50 percent of QECB issuances have been used for public building energy improvements, and many have not been large ESCO-implemented projects—local governments have issued QECBs to fund and implement a diverse array of smaller initiatives. For example, in 2010, Waterbury, CT issued \$4.7 million of QECBs to replace windows and make heating and air-conditioning improvements in the Waterbury City Hall and public library. In addition to government facilities, public schools and universities have also been frequent beneficiaries of QECB-funded projects—in Wisconsin, for example, at least seven QECB issuances for almost \$14 million of total funding have been used to fund energy improvements in public educational facilities.

### Additional Resources

Program Contacts	
<b>City of Philadelphia Mayor's Office of Sustainability</b>	Adam Agalloco Project Manager <a href="mailto:adam.agalloco@phila.gov">adam.agalloco@phila.gov</a>
Philadelphia QECB Resources	
QECB Official Statement <a href="http://financing.lbl.gov/reports/phil-statement.pdf">http://financing.lbl.gov/reports/phil-statement.pdf</a>	
General QECB Resources	
DOE QECB Website <a href="http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/qecb.html">http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/qecb.html</a>	
LBL QECB Web Portal <a href="http://financing.lbl.gov">http://financing.lbl.gov</a>	
To request technical assistance on QECBs, send an email to <a href="mailto:TechnicalAssistanceProgram@ee.doe.gov">TechnicalAssistanceProgram@ee.doe.gov</a>	