Early Lessons on Introducing Energy Performance Contracts in Italy: Milan's Energy Efficiency Program

Valerio Micale, Jeff Deason, and Morgan Hervé-Mignucci
September 2014

The worldwide energy efficiency market is valued in the hundreds of billions of dollars (IEA 2014) yet most of that opportunity has yet to be tapped despite decades of policy and private sector efforts. Public interest in energy efficiency has increased worldwide of late as countries attempt to improve productivity and achieve low-cost carbon emissions reductions; however, a set of investment barriers and the global financial crisis have restricted the available public support, preventing money saving energy efficiency investments (CPI 2013).

Experience shows that financing arrangements can help overcome some of these barriers. For instance, in light of scarce public finance, public institutions in a growing number of countries are managing to reduce the energy costs and carbon emissions of public buildings without any budget outlay through energy service companies (ESCOs). ESCOs have successfully carried out public sector energy efficiency programs in countries such as the United States, Canada, Germany, Finland, and Denmark (Shonder et al., 2010) by facilitating financing arrangements known as energy performance contracting (EPC). Under the EPC model, ESCOs perform energy efficiency projects, take on the performance risk of energy-saving improvements, guarantee cost savings to the end user, and use the energy bill savings resulting from the projects to pay off the initial investment at no up-front cost to the building owner.

A lack of capital, knowledge gaps, and institutional barriers have deterred other countries from implementing similar initiatives. In Italy, ESCOs generally supply bundled energy services contracts to the public sector, including both energy-saving services and fuel supplies. This discourages the diffusion of non-bundled, "pure" EPC. Pure EPC is a more effective formula for energy efficiency; however, it is less advantageous for Italian ESCOs, who earn more money through bundled service arrangements and therefore do not offer pure EPC services. As a result, their clients miss out on energy efficiency opportunities (Zabot and Di Santo, 2013).

This CPI Brief introduces the "Energy Efficiency Milan Covenant of Mayors" program implemented by the Province of Milan and supported by a Technical Assistance grant from the European Commission's European Local ENergy Assistance (ELENA) program and a loan from the European Investment Bank (EIB). The program is designed to facilitate and finance energy efficiency retrofits for public school buildings in municipalities participating in the Covenant of Mayors initiative. ESCOs perform the work and guarantee savings using standardized energy performance contracts with third-party financing. The program is the first in Italy covering energy savings alone and introducing pure EPC on a regional scale. No projects have yet been implemented, so the ultimate energy, cost, and emissions impacts of the program cannot be evaluated. Still, we can learn lessons from the program implementation experience to date.

We conclude that the EPC model helped the Province by 1) moving energy efficiency investment off municipal balance sheets; 2) testing a new system of incentives and contract structures in support of "efficient energy efficiency projects"; and 3) inducing participation by one local bank, partially unlocking the energy efficiency lending market. From the implementation of the program we learn that:

- Grant-based support from the ELENA facility (funded from the Intelligent Energy Programme II, managed by the EIB) and a private banking foundation was critical to enabling the Province's initiative.
- The program successfully tested standard energy performance contracts (EPC) in the Italian ESCO market for public retrofits, mobilizing local banks and improving the governance of energy-related investments through the involvement of the Province. However, program startup costs have been higher than expected.
- The program still faces barriers from existing ESCO business models in Italy, while banks' uncertainties with regards to the energy efficiency sector make it hard to guarantee the cost reductions and transparency needed to foster market transformation.

The brief begins with an overview of the program, including a description of the main contract and financial arrangements. We then review the principal barriers the program has faced and preliminary lessons learned from the development of the program, as well as potential implications for similar programs. We conclude with an update on the next steps of the program, and potential follow-up analysis.

Program Description

Objectives

The program, administered by the Province of Milan, facilitates the energy efficiency retrofitting of schools and other public buildings. The buildings to be retrofit are located in municipalities participating in the Covenant of Mayors initiative, and the program is designed to meet the energy reduction targets set out by the Covenant.[1] The environmental targets of the program include the achievement of energy savings of at least 20%, with emission reductions of about 9,000 tCO2 every year. In terms of economic results, on top of energy bill savings for the municipalities through off-balance sheet financing of energy efficiency measures, the program is expected to support local ESCOs, small businesses, and professionals, and lead to the creation of 900 permanent jobs (Giunta Provinciale, 2010).

Design

The program introduces a regional EPC-based system for supporting public sector energy efficiency retrofits that is novel in Italy.[2] The program benefits from financial support from the European Investment Bank (EIB), with ESCOs carrying out the energy efficiency improvements. Its third party financing structure results in immediate energy bill savings for the public administrations that support investments in energy efficiency.

On the next page, Table 1 and Figure 1 summarize program actors and financial flows.

1 The "Covenant of Mayors" initiative was launched in 2008 by the European Commission to encourage cities and their citizens to achieve (or go beyond) the objectives of a sustainable energy policy in the implementation of the 20-20-20 Package (a 20% reduction in greenhouse gas emissions relative to 1990 levels, a 20% share of renewable electricity generation, and a 20% reduction in primary energy use relative to projections, all by the year 2020). In line with the targets set in the provincial program on energy efficiency, on February 2009 (EIB, 2009) the Province entered into a partnership with the European Commission in which the Province plays a supporting role in the implementation of the Covenant of Mayors (EIB, 2013a). The EIB also joined the Covenant of Mayors.

2 EPC was first used in Europe by the Berlin Energy Agency in 1996, and subsequently replicated in other European countries. EPC is also used in other countries, such as the United States, that are not specifically modeled after the Berlin program but use generally similar contracting approaches.

Figure 1 - Program Stakeholders' Map

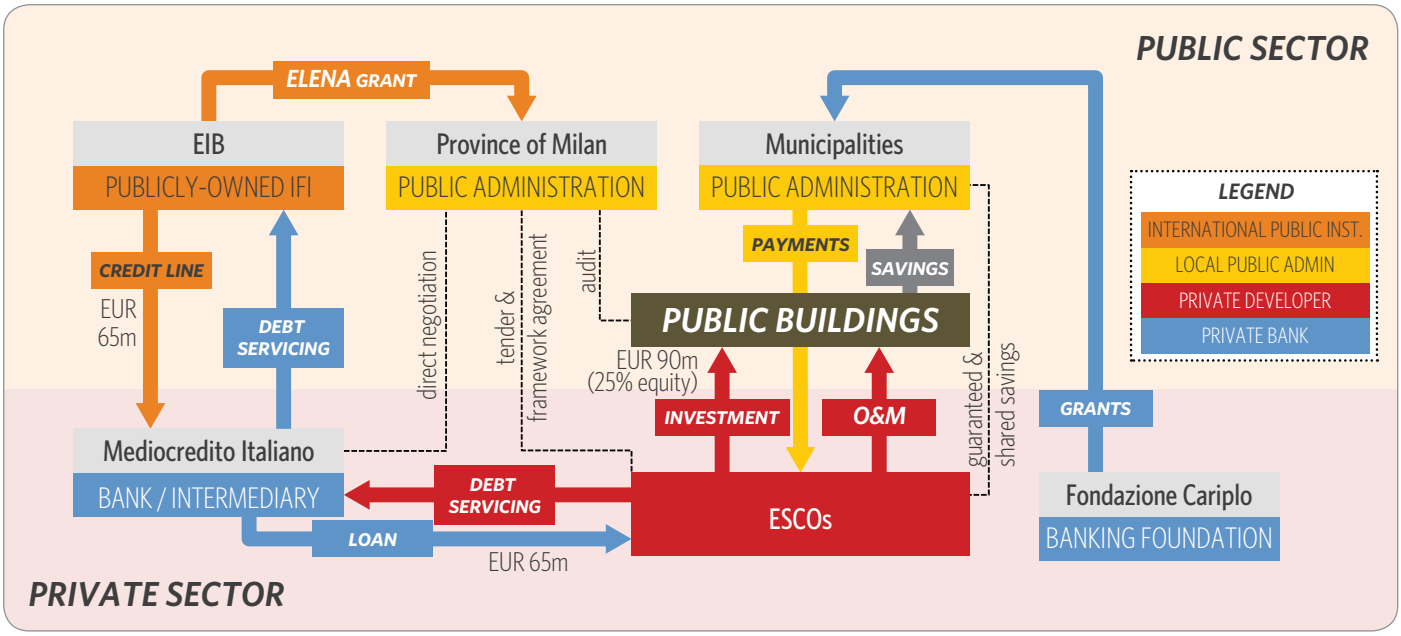


Table 1 – Program key actors and roles

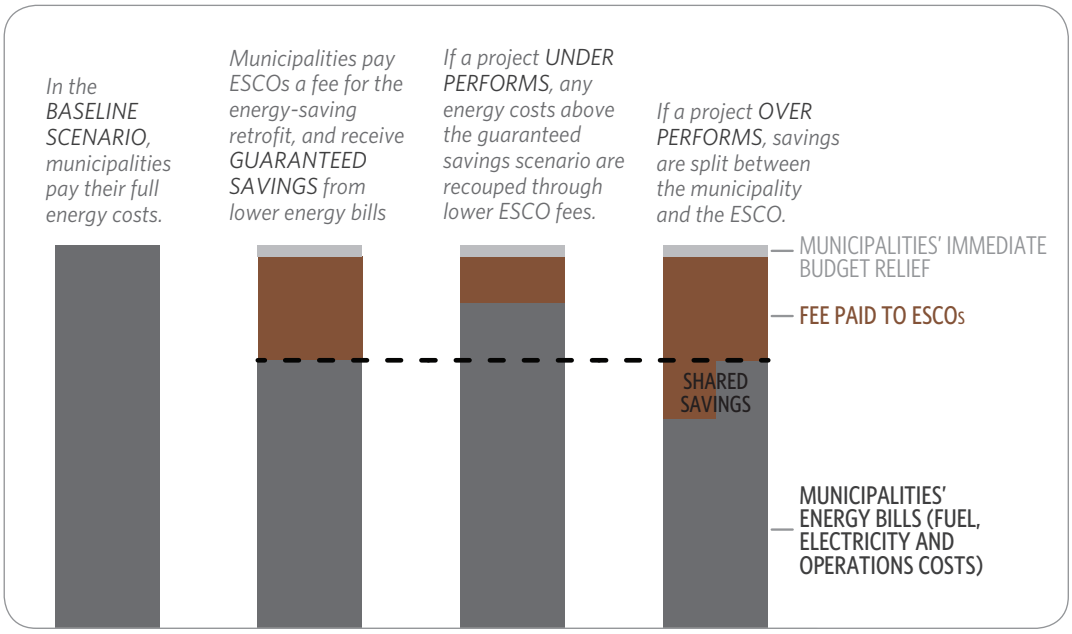
PROVINCE OF MILAN	**Manages the investment program through a dedicated Project Implementation Unit, supported by external experts.** The unit promotes and analyzes the proposals of potential projects by municipalities[a] and provides technical support for their implementation. The Province is assisted by external legal and technical advisors for the co-ordination and harmonization of energy audits, and for structuring the entire process from a legal, economical and technical standpoint. This includes the production of legal documentation necessary to select the ESCOs via a tender process, negotiations with ESCOs and banks, and monitoring and dissemination of results and transfer of knowledge to other provinces.
EIB - EUROPEAN INVESTMENT BANK	**Plays a key role in securing financing to the program, acting both as lender for the financing of energy efficiency interventions and as administrator of a grant for capacity building.** As a lender EIB provides a credit line for about EUR 65 million, covering up to 75% of ESCOs' investment, via a local financial intermediary (Intesa San Paolo/Mediocredito Italiano). The European Local ENergy Assistance (ELENA) program — a program funded by the European Commission's Intelligent Energy-Europe programme and run by the EIB to support local and regional authorities to reach 20-20-20 targets[b] — covers 90% of technical assistance costs (both internal and external through consultants) needed to support the development of the investment program, for EUR 2 million (Giunta Provinciale, 2010). ELENA expects to leverage its grant by a factor of 20 in total energy efficiency investment, and hopes to induce replication of the initiative in other municipalities (EIB, 2013b).
ESCOS - ENERGY SERVICE COMPANIES	**Receive financing from the intermediary, provide the additional investment cost from their own resources, perform the work planned under the program, and guarantee savings to the municipalities.** ESCOs deal with the different phases of project development, including performing a feasibility study, planning the intervention, and installing and maintaining equipment. They guarantee energy savings of at least 20% of annual consumption. ESCOs bear not only the performance risk but also an obligation to provide the balance of funding that the EIB credit line will not cover (around 25% of investment costs), likely in the form of equity.
MEDIOCREDITO ITALIANO	**Intermediates lending between EIB and ESCOs**, adding a spread on top of the EIB credit line.
MUNICIPALITIES	**Make payments to ESCOs based on actual building energy use and receive guaranteed bill savings;** the precise terms are discussed below.
FONDAZIONE CARIPLO	**Key enabler of the Program by having funded prior audits of municipal buildings in the Province.** The grant provided in 2006 by Cariplo, a philanthropic banking foundation, covered the energy audits of 900 public buildings in 103 municipalities with less than 30,000 inhabitants in the Province of Milan (Fondazione Cariplo, 2011).

a Province has to contact the municipalities adhering to the Covenant of Mayors verifying their willingness to participate to the Program, and helping them identify a priority list of buildings for the assessment of Energy audits.

b The 20-20-20 targets were approved by the EU Council in March 2007, and confirmed in December 2008 with the adoption by the European Parliament of the "Climate and Energy Package". Specific targets are a 20% reduction in greenhouse gas emissions relative to 1990 levels; attaining a 20% share of renewable electricity generation; and a 20% reduction in primary energy use relative to projections, all by the year 2020.

The program is designed to separate contracts for energy delivery from energy savings services, usually bound together in previous practice across the Italian ESCO market, by introducing standard energy performance contracts (EPC) with guaranteed performance. After the retrofit projects are done, the municipality pays its remaining fuel and electricity costs, together with a fee to the ESCO that is recalculated every year on the basis of that year's energy bill. Regardless of actual performance, the municipality receives a percentage of the guaranteed energy savings during the 15-year contract period as immediate financial savings. As such, only the ESCO is at risk if savings fall short of the guarantee. If actual energy savings are lower than the guarantee, the municipality retains the difference from the fee paid to the ESCO; if actual energy savings are higher than the guarantee, the additional savings are shared between the municipality and the ESCO. See Figure 2 for a representation of the savings distribution under various scenarios.

Figure 2 – EPC shared savings mechanism as used in Milan



Adapted from Zabot and Di Santo, 2013. Note: Guaranteed savings are calculated based on the energy baseline only, excluding expenses related to O&M.

The Province selects ESCOs through a series of public calls for tender, each of which covers a subset of the participating municipalities. Most parameters of the contract are open for definition in the tender process within pre-established bounds, including some of the measures to be implemented in each building; the value of the investment proposed; the duration of the contract period; the energy savings the ESCO guarantees to achieve; the percentage of the guaranteed savings provided as immediate financial savings to the municipalities; and how any additional savings on the energy bill will be shared between the municipality and ESCOs should energy savings exceed those in the ESCOs' guarantee. The Province selects the winning bid by weighting these economic parameters and according to the policy goals it wants to achieve (including energy use and emissions reductions, financial savings for the municipalities, and other factors). The Province has successfully completed two calls for tender. See Table 2 for a summary of the first tender requirements and the terms specified by the winning bid.

Table 2 - Summary of first tender requirements and terms of the winning bid

	VALUE OF INVESTMENT	DURATION OF CONCESSION PERIOD	GUARANTEED SAVINGS	IMMEDIATE BUDGET RELIEF	SHARE OF EXTRA SAVINGS GOING TO MUNICIPALITIES
First tender requirements	≥EUR 6,000,000	≤15 years	≥20%	≥5%	20-50%
Results of 1st tender	EUR 13,000,000	15 years	35%	5%	50%

Source: Zabot, 2012; Zabot and Di Santo, 2013.

Implementation

Program activity started in 2009, but the program is only now entering its operational phase with retrofit projects likely to be completed in the second half of 2014. The program officially started in July 2009, with the approval of the loan by the EIB, followed by the ELENA funding agreement between the province and the EIB in 2010. There has been a significant delay compared with the original 36-month timeline, in which all projects were to be completed by 31 December 2013. Delays have mainly been due to the time-consuming tender process for choosing technical, financial and legal consultants and to the lengthy process of identifying the financial intermediary, which was ultimately determined via direct negotiation after two public tenders failed to find one. The tender process for the first lot of public buildings, covering 98 buildings in 16 municipalities, was concluded in September 2012, and project work began in the summer of 2014 (Riqualificazioni, 2014). A second tender covering 38 public school buildings in the municipality of Milan was concluded in summer 2014, for a total investment value of EUR 4,211,353.46 (Provincia di Milano, 2014). An additional lot of projects is still undergoing tender selection.

The Province of Milan originally set up a tender process to select a financial intermediary that would administer the lending process and charge a spread above the EIB interest rate, but tenders went void and the intermediary was eventually chosen via direct negotiation. In order to push for lower end-user interest rates and more transparency, the Province of Milan originally set up a tender process to select a financial intermediary. Potential intermediaries were originally asked to offer a spread above the EIB interest rate that they would charge to lend to ESCOs; the Province could then select the lowest spread bid. However, local banks that had initially expressed interest chose not to participate. As a result, no intermediaries submitted bids; the intermediating bank was eventually chosen via direct negotiation. The intermediary will now apply interest rates on a case-by-case basis, after assessing the beneficiary's creditworthiness.

Implementation barriers and preliminary insights about the program

The following are some preliminary takeaways from the program that may have potential implications for similar projects around the world:

- **Information, knowledge, and technical capacity are fundamental prerequisites for setting up effective public energy efficiency programs, but public administrations at the local level often lack adequate financial resources to acquire them. External grant funding — both private and public — can play a critical role.** ELENA funds, approved in 2010, have been used to enhance the Province's implementation capacity by financing the technical, administrative, and financial engineering of the program. This support is necessary because small municipalities have limited experience with standard contracts and monitoring of similar programs, and they lack financial resources to hire this expertise internally (Zabot, 2011). Preliminary energy audits of public buildings sponsored by Cariplo in 2006 were also fundamental in estimating the investment potential of the program and enabling the Province to negotiate with ESCOs without information asymmetries (EIB, 2013c).[3]
- **The implementation of EPC contracts in the public sector can encounter barriers from existing business models, markets, and regulation in a country. A barrier faced by the program in Milan is the existence of current ESCO "servizio energia" contracts in Italy, which bundle together energy savings and energy supply.** The Energy Efficiency program in Milan introduces pure EPC, attempting to overcome existing conflicts of interest in current ESCOs energy supply contracts ("servizio energia" as per Legislative Decree N. 115/2008), which bundle supply of electricity and fuel with energy-saving improvements. These contracts

3 If the public administration does not have a full awareness of savings potential, and investment required, it hardly is able to enter contractual negotiations with ESCOs starting from a position of strength similar to the one of the Province of Milan within its Program. Nevertheless, such audits require significant investments that municipalities often cannot make without external financial support (EIB, 2013c). Despite not being directly involved in the current implementation of the Program run by the Province of Milan, Cariplo is still playing a pioneering role by extending Technical Assistance grants directly to Municipalities (see "Bando 100 comuni efficienti e sostenibili" at http://www.fondazionecariplo.it/it/bandi/index.html).

are financially and administratively advantageous for energy services providers (who profit from fuel supply) and public administrations (who can launch an individual tender for energy services and supply, rather than two separate tenders).[4] However, this form of contracting does not favor reduction of energy consumption, as ESCOs can achieve energy bill reductions through discounts on fuels, thus lowering performance risks and discouraging energy efficiency investments (EIB, 2012; Zabot, 2013). The Milan program has successfully established contracting procedures for pure EPC, but ESCOs' interests in bundled contracting may be limiting their interest in participating in the program. To overcome this barrier, it may be necessary to require that local governments in Italy use pure EPC contracts where reductions are pursued exclusively on energy efficiency interventions (Zabot and Di Santo, 2013), which would require significant political will and effort. More incremental approaches, such as increased transparency of how bundled contracts are satisfied (perhaps via requiring accounting separation between fuel supply and other activities), may also be possible.

Moreover, the availability of performance bonds that insure ESCO customers if ESCOs fail to satisfy their performance contracts is limited in Italy. This lowers the efficiency of risk allocation, reducing the attractiveness of some interventions that might be viable in a more fully developed market (Zabot, 2013).

- **The tranfer of control over energy-related investments from municipalities to the province is one of the main barriers to the successful replication of this and other similar programs, especially in contexts characterized by political divisions between levels of government.** The Milan program has successfully engaged municipalities, but for them participation in the program entails a trade-off between improvement of governance and loss of control over energy-related investments. The benefits (energy savings) occur over time and are in large part not relevant to the electoral concerns of incumbent officials. Furthermore, in the case of the Province of Milan, only 16 municipalities out of 30 contacted participated in the bid for the first lot of public buildings: upcoming administrative elections interfered with decisions over participation in the program, as did existing energy supply contracts (see previous bullet). Municipalities have also faced personnel-related costs as they hire or train staff to help implement the program.
- **The involvement of local banks in the provision of loans has significant advantages, but the uncertainties still perceived in the energy efficiency sector, along with the strictness of current Basel rules, make it difficult to guarantee a level of cost reduction and transparency that would be transformative for the market.** Using local banks as intermediaries for EIB's loans is likely to be more efficient to the extent that they are more familiar with the territory where they operate. However, with the failure of the tender process for the intermediary (at least in part due to the ongoing financial crisis), the program lost the opportunity to identify a fixed spread over EIB's interest rate that would make it easier for ESCOs to predict the potential returns of their investments and under what terms they would want to participate. In addition, resultant spreads are likely to be higher than initially hoped, reducing the economic attractiveness of the projects from the ESCOs' perspective and, perhaps, the ambition of the retrofits they are able to profitably propose. A number of reasons may explain the void tenders:
  - » Despite initial expressions of interest in an auction starting from a maximum spread, and despite the success of similar previous initiatives,[5] financial intermediaries were in the end reluctant to specify lending terms without knowing which ESCOs would be performing the work;

4 These contracts also allow ESCOs to direct a portion of the contract towards additional measures that are not related to energy efficiency (such as extraordinary maintenance and regulatory compliance), allowing the municipality to avoid conducting separate tenders but weakening the incentives for energy savings (Zabot, 2013).

5 The use of committees for estimation of client creditworthiness had already been implemented by the program "Mutuo a Profitto". The program, launched in 2007 by the Province of Milan, provided green loans to consumers for energy efficiency retrofits of their homes. Banks applied a fixed interest rate covered by the Province contribution and by the banks themselves. In order to overcome banks' lack of information on the creditworthiness of the loans, an Evaluation Team was established, including representatives from the bank and from the Province's network of energy information desks (InfoEnergia), evaluating the request respectively from a financial and technical point of view (Zabot et al., 2011).

  - » In general it is difficult to engage banks in a tender process for complex programs targeting markets that are not very developed and involve relatively innovative forms of contracting (in this case, pure EPC for Italy);
  - » Unlike infrastructure investment, energy efficiency investments cannot be backed by mortgages on physical assets. Thus, the intermediating bank cannot be made whole from collateral in the event of default, and is exposed to long-term (15 years') corporate default risk. This is a classic problem of energy efficiency finance, and the lack of project-based security is reflected in the interest rates intermediaries will charge, perhaps contributing to their unwillingness to offer the rates the Province sought.
  - » Banks prefer a project financing approach, in which projects are financed based on their cash flows and their own collateral value without recourse to company balance sheets. However, due both to the high transactions costs of arranging the contractual arrangements required and to the relatively low collateral value of energy efficiency improvements, this is impracticable for small investment amounts of less than € 5-10 million (Rezessy and Bertoldi 2010).
- **These programs can be costly and time-consuming for the public administrations that run them.** Time requirements need to be properly estimated and account for internal regulations and administrative procedures, in order to avoid unforeseen delays in program implementation. Costs also need to be properly assessed: while some of them are direct and immediate like contracting costs, other costs are indirect and more difficult to estimate. The largest costs in the Milan case related to the initial determination of energy use baselines; the preparation of documentation needed for tendering processes; monitoring and verification of ESCOs' work; and the negotiation of changes required during the implementation of the contracts. In addition to these costs, unexpected expenses such as legal claims represent a particular threat during the tender process; these can paralyze local administrations unless they are assisted by legal advisors (EIB, 2012; Zabot and Di Santo, 2013).

Learning the lessons from the Milan program: next steps

This brief presents early findings from the Milan program, which is at an early stage. In the future, as retrofits are completed and investments made and repaid, it will be possible to acquire more information on the investment structure of participating ESCOs and on the experience of all program participants. This would allow for:

- Analysis of the **financial impacts** of the program for different stakeholders, in particular on returns and investment decisions for ESCOs and for the public administration running the program, as well as implications of the **risk distribution mechanisms.**
- Analysis of the **effectiveness of the use of public money** compared to alternative energy efficiency initiatives targeting public buildings, and potential improvements to catalyze finance.
- Analysis of the best approaches for r**eforming existing energy contracting practices and/ or improving the availability of performance bonds** to facilitate more effective use of EPC to drive energy savings.
- Analysis of potential impacts of the program on the **spread of the EPC model** in Italy, with an assessment of its **replicability**. This may include considerations over the design of the contractual and tender mechanisms and their complexity, and potential improvements such as the possibility of moving to project financing (or other techniques) rather than corporate finance to isolate the program from corporate default risk, free ESCOs balance sheets, and improve their access to affordable finance.
- Analysis of the **merits of intermediation** for this and similar programs relative to alternative financing channels.

CPI remains committed to improving the understanding of how to accelerate efforts to achieve the transition to a sustainable economy, based on lessons learned from experience.

References

Berger, S. 2011. "Energy Saving Partnership Berlin - Best Practice Examples and Future Developments". International Conference "Climate protection potential of energy efficiency", Brussels, 09 November 2011. Berliner Energieagentur GmbH. Available at: http://www.ecologic.eu/files/attachments/Projects/2358/prasentation_berger.pdf

CPI. 2013. "Buildings Energy Efficiency in China, Germany, and the United States". Climate Policy Initiative: San Francisco. Available at: http://climatepolicyinitiative.org/publication/buildings-energy-efficiency-in-china-germany-and-the-united-states/

EIB. 2013a (access). "Energy Efficiency Milan Covenant of Mayors." Available at: http://www.eib.org/projects/pipeline/2008/20080739.htm

EIB. 2013b (access). "FAQ - Programme development support from ELENA". Available at: http://www.eib.org/attachments/documents/elena_faq_en.pdf

EIB. 2013c. Personal communication. July 30th 2013

EIB. 2012. "ELENA Interim Report: Energy Efficiency Milan Covenant of Mayors". European Investment Bank.

EIB. 2009. "Document 09/465 - Board of Directors. Framework Loan from own resources – Energy Efficiency Milan Covenant of Majors Project". European Investment Bank.

Fondazione Cariplo. 2011. "Download Audit GIS." Available at: http://www.webgis.fondazionecariplo.it/public/auditgis/download.php

Giunta Provinciale. 2010. "Proposta di contratto tra la BEI e la Provincia di Milano per l'assistenza tecnica al progetto pilota 'Energy Efficiency Milan Covenant of Mayors' a valere sul programma European Local ENergy Assitance (ELENA)". Verbale di Deliberazione della Giunta Provinciale. Available at: http://temi.provincia.milano.it/rggiun/%5Cdoc%5C1003792010157336.pdf

IEA. 2014. World Energy Investment Outlook. OECD/International Energy Agency: Paris.

Provincia di Milano. 2014. "Procedura ristretta per la selezione di Energy service company (Esco) ai fini della concessione mista di beni e servizi per la riqualificazione energetica e la gestione di edifici pubblici di proprietà del Comune di Milano, n. 38 strutture scolastiche, con finanziamento tramite terzi (ftt) ai sensi dell'art. 2, comma 1 lett. m) del D. Lgs. 115/2008. CIG 51815362C6. Aggiudicazione definitiva ed efficace alla Società PVB Solutions Spa. Provvedimento non comportante spesa." Determinazione Dirigenziale Provincia di Milano. Available at: http://temi.provincia.milano.it/albopretoriool/dettaglio.asp?id=14056058729

Rezessy, S., Bertoldi, P. 2010. "Financing Energy Efficiency: Forging the Link Between Financing and Project Implementation." European Commission Joint Research Centre, Institute for Energy. Available at: http://ec.europa.eu/energy/efficiency/doc/financing_energy_efficiency.pdf

Riqualificazioni. 2014. "La riqualificazione energetica di edifici pubblici: in fase di cantierizzazione il progetto della Provincia di Milano." Available at: http://www.riqualificazioni.it/wordpress/la-riqualificazione-energetica-di-edifici-pubblici-in-fase-di-cantierizzazione-il-progetto-della-provincia-di-milano/#more-1689

Shonder, J., E. Morofsky, F. Schmidt, M. Himanen. 2010. "Best Practice Guidelines for Using Energy Performance Contracts To Improve Government Buildings". International Energy Agency – Energy Conservation in Buildings and Community Systems Programme. Available at: http://www.ecbcs.org/docs/Annex_46_ESPC_Best_Practices.pdf

Zabot, S. 2013. Personal communication. Sept 20 2013.

Zabot, S. 2011. "Il fondo ELENA della Banca Europea per gli Investimenti L'esperienza della Provincia di Milano." Available at: http://www.provincia.torino.gov.it/ambiente/file-storage/download/energia/pdf/patto_sindaci/energethica/Zabot_energethica.pdf

Zabot, S. 2012 "Il caso della Provincia di Milano". Presentation at Smart City Exhibition 2012, Bologna, 29 October 2012. Available at: http://www.slideshare.net/SmartCityExhibition/zabot

Zabot, S., D. Di Santo. 2013. "Guida ai Contratti di Prestazione Energetica negli Edifici Pubblici". Ente per le nuove tecnologie, l'energia e l'ambiente and Federazione Italiana per l'uso Razionale dell'Energia. Available at: http://www.tazioborges.it/Documenti/Guida_agli_EPC.pdf

Zabot, S., C. Monguzzi, and G. Ruggieri. 2011. "Green loans experiences as investment multiplier schemes". In Energy efficiency first: The foundation of a low-carbon society. 2011 Summer Study: pp. 293-303. European Council for an Energy Efficient Economy, Stockholm. Available at: http://proceedings.eceee.org/visabstrakt.php?event=1&doc=2-084-11

Acknowledgements

The authors wish to thank the following professionals for their cooperation and valued contributions including, Ralf Goldmann, Christopher Knowles, Angela Mancinelli, Louise White, and Sergio Zabot. The authors would like to acknowledge the contribution of Barbara Buchner, Dan Storey, Tim Varga and Julia Zuckerman for their continuous advice, support, comments, and internal review.

San Giorgio Group Overview

This paper is one of a series prepared by Climate Policy Initiative (CPI) for the San Giorgio Group, a working group of key financial intermediaries and institutions engaged in green, low-emissions, and climate-resilient finance. San Giorgio Group case studies seek to provide real-world examples of how public resources can spur low-carbon and climate-resilient growth, what approaches work, and which do not. Through these case studies, which share a systematic analytical framework, CPI describes and analyzes the types of mechanisms employed by the public sector to catalyze and incentivize private investment, deal with the risks and barriers that impede investment, establish supporting policy and institutional development, and address capacity constraints.

About CPI

Climate Policy Initiative (CPI) is a team of analysts and advisors that works to improve the most important energy and land use policies around the world, with a particular focus on finance. We answer pressing questions posed by decision makers through in-depth analysis on what works and what does not. CPI works in places that provide the most potential for policy impact including Brazil, China, Europe, India, Indonesia, and the United States.