

Energy Efficiency Finance in Pennsylvania

Summary: Propel increases in non-utility delivered demand-side energy efficiency by providing education, access and funding for innovative energy efficiency finance tools.

Background and Overview:

Energy efficiency and conservation are often the least-cost resources to meet our energy needs, reduce greenhouse gas (GHG) emissions, and save consumers money.

- Cost-effective GHG abatement – As noted by numerous studies, energy efficiency strategies often dominate cost-effective approaches to GHG abatement (Figure 2).
- Consumer cost savings – The cost saving opportunities and successes of energy efficiency are well documented in public utility law. In Pennsylvania, the first phase of the state’s energy efficiency requirement for electric utilities (Act 129 of 2008) provided \$2.79 in benefits to consumers for every \$1 in cost.¹

While energy efficiency and conservation are proven effective resources for GHG abatement and economic development, access to capital can be a barrier to implementing energy efficiency and energy conservation projects in Pennsylvania homes and businesses. Innovation in the design of energy efficiency financing programs are creating easier access to capital, helping minimize initial out-of-pocket project costs, and employ repayment strategies tethered to the predictive performance of the energy efficiency and energy conservation measure implemented. The use of these innovative financial tools are in addition to traditional one-time grant and rebate programs, and also serve to recycle funding dedicated for use in future projects. These financing mechanisms are encouraging home and business owners to consider investing in energy efficiency improvements with greater regularity; drawing private capital to the efficiency marketplace. The core contents of an energy efficiency financing program include:

- Predictive energy savings from energy efficiency and energy conservation projects resulting in reduced energy bills.
- Monetary gain from energy savings, cost per energy unit not consumed, can be leveraged over time to pay back the capital cost improvements with minimal immediate out-of-pocket expenses.
- Energy Efficiency project deployment is both an investment in goods and services which in turn creates jobs, drives the economy and creates competition in the energy efficiency, energy conservation deployment marketplace.
- Competition drives down the cost of projects, creates consumer confidence, and results in deeper penetration of energy efficiency and conservation measures deployed.
- Deeper penetration of energy efficiency and conservation measures increases GHG abatement.

¹ PA PUC, Act 129 Statewide Evaluator Final Annual Report for Phase 1 (June 1, 2009 – May 31, 2013). p. 205

Existing Programs:

Pennsylvania has already demonstrated overall success at achieving cost-effective energy efficiency outcomes through energy efficiency and conservation measures implemented via its energy efficiency standard, Act 129 of 2008. The Statewide Evaluations report for Phase 1 achieved pursuant to Act 129 is summarized below in Table 1.

Table 1: Summary of Statewide Technical Reference Manual Verified Savings:

	CPITD Reported Gross Impact	CPITD TRM Verified Gross Impact	Savings Achieved as % of 2013 Targets
Total Energy Savings (MWh/yr)	5,567,257	5,403,370	123%
Top 100 hours Demand Reduction (MW)	1,405.12	1,349.92	113%
Total Demand Reduction	1,608.64	1,540.61	N/A
TRC Benefits (\$1,000)	N/A	\$4,192,389	N/A
TRC Costs (\$1,000)	N/A	\$1,755,384	N/A
TRC Costs-Benefits Ratio	N/A	2.4	N/A
CO2 Emissions Reduction (Tons)	3,535,208	3,431,140	N/A

Furthermore, Pennsylvania has the following electric energy efficiency potential over a 10-year period as a percentage of forecasted kilowatt hour sales for the baseline period of June 2009 through May 2010:²

- 32.6% technical potential (i.e. technically feasible)
- 27.2% economic potential (i.e. technically feasible and cost effective)
- 17.3% achievable potential (i.e. technically feasible, cost effective, and minimal market and adoption barriers)
- 5% program potential (i.e. technically feasible, cost effective, minimal market and adoption barriers and within staffing/time/budget constraints)

In addition to measures implemented via its energy efficiency standard, Act 129 of 2008, Pennsylvania is further tapping in to energy efficiency savings potential by undertaking several effective energy efficiency financing programs:

Keystone Homeowner's Efficiency Loan Program(HELP) HELP is an Energy Efficiency Loan Program designed to help homeowners improve energy efficiency with special loan financing for high efficiency heating, air conditioning, insulation, windows, doors and whole house improvements. HELP also included special offers such as a residential geothermal energy

² PA PUC, Electric Energy Efficiency Potential for Pennsylvania, Final Report, May 10, 2012, prepared by GDS Associates

efficiency loan program. Since inception, PA Treasury together with AFC First Financial and their network of certified contractors has made 13,000 loans, putting to work \$108 million in financing. HELP loans have allowed homeowners to save an estimated 40MWH of electricity, 100,000 MCF of natural gas and 300,000 gallons of heating oil.

Energy Service Performance Contracting (ESPC) and Guaranteed Energy Savings Act (GESA):

ESPC is a financing approach to accomplish facility improvements that reduce energy and water use while improving building operational efficiency. A new program entitled Pennsylvania Sustainable Energy Fund (PennSEF) will use the ESPC and GESA model to target municipal and state governments, universities and colleges, K-12 schools, and hospitals (MUSH) sector. The Pennsylvania Treasury Department has recently partnered with the Foundation for Renewable Energy and Environment (FREE), with financial support from the West Penn Power Sustainable Energy Fund, to develop a prudent, market-based investment vehicle that promotes energy and water efficiency, clean energy generation, economic development, and environmental improvement. PennSEF's design is intended to provide cost clarity, financing through Treasury bonds, legal assistance, contractor pre-approval, and result in significant risk reductions for public entities looking to deploy ESPC project through the GESA model.

In general, a facility owner partnering with an energy service company (ESCO) uses ESPC mechanism to pay for facility upgrades by leveraging predictive energy savings without tapping into capital budgets. ESPCs provide technical, engineering and managerial expertise while private sector financial institutions fund the retrofit projects. The ESCO guarantees that the improvements will generate energy cost savings to pay for the project over the term of the contract. To further create confidence and overcome antiquated procurement processes, PA's Guarantee Energy Savings Act (GESA) provides a procurement tool that allows for the best qualified, best value, and best fit selection of a pre-qualified Energy Service Company (ESCO) rather than utilization of a design-build, lowest responsible bidder process.

Following is a sampling of past projected savings from ESPC projects under the GESA program:³

- **Total Project Savings:** \$359.7 Million
- **Guaranteed Savings:** \$323.5 Million
 - o **Operational Savings:** \$25.2 Million
 - o **Utility Savings:** \$306.9 Million
 - o **Avoided Capitol:** \$53.1 Million
 - o **Net Savings:** \$44.1 Million (*savings, repayment, annual ESCO payment*)
- **Emissions (26 Projects)**
- Annual Avoided CO2: 111,442 Tons
- Annual Avoided Greenhouse Gas: 112,406 Tons
- Annual Avoided MMBTU: 857,354

³ PA Department of General Services, 2010: Guaranteed Energy Savings Act Presentation

Small Business Pollution Prevention Assistance Account (PPAA): The Pollution Prevention Assistance Account (PPAA) offers low-interest loans to help small businesses (100 full-time employees or less) located within the state to implement energy efficiency and pollution prevention projects. Loans may be issued for 75% of project costs up to \$100,000 within any 12-month period, with terms of up to 10 years. 2% interest rate. The program is only available to qualifying businesses that adopt or install pollution prevention or energy efficient equipment or processes that reduce or reuse raw materials on-site, reduce the production of waste, or significantly reduce energy consumption and are directly related to the business activity. Renewable energy systems are eligible for loans under this program if they meet the project eligibility criteria.⁴

Qualified Energy Conservation Bonds (QEBCs): QEBCs were created by the 2008 Energy Improvement and Extension Act and the American Recovery and Reinvestment Act of 2009. QEBCs were issued to States and Territories and a portion was allocated to large local governments and municipalities with a population of 100,000 or more. Pennsylvania received a total allocation of \$129 million. To date, approximately \$41 million of QEBCs have been issued in Pennsylvania, including \$15.8 million for an ESPC project with the Pennsylvania Department of Corrections. QEBCs are a long-term financing option usually from 12 to 26 years. QEBC can be used for a variety of energy project types including reduction of energy consumption in publically owned buildings by at least 20% and, to implement, green community programs (including the use of grants, loans, or other repayment mechanisms to implement such programs. Some allocations of QEBCs are not being used for energy projects due to administrative burdens, transactional costs, or inability to match projects with the bond capital. Some municipalities have expressed concerns about using QEBCs because federal budget sequestration efforts can impact (even retroactively) the QEBC subsidy amount, leaving the remaining liability with the municipal issuer. Some states have explored, and have used different approaches to, encourage the use of QEBCs allocated to municipalities, including implementing processes by which large local governments may return their sub-allocations to the states for use.

Potential New Programs:

In addition to the cost-effective activities implemented through Act 129 and additional energy financing opportunities, other public-private energy-efficient financing program models could be promoted and used in Pennsylvania to broaden and enhance the impact and overall penetration of energy efficiency project deployment in Pennsylvania. A sampling of these programs includes the following:

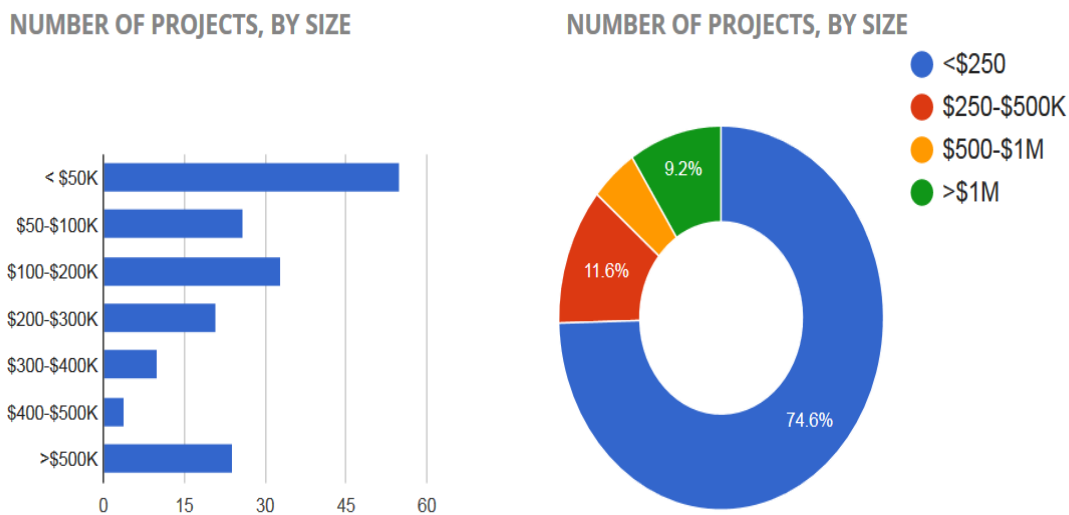
Commercial Property Assessed Clean Energy (CPACE) – CPACE programs pay for 100% of an energy efficiency project's costs. These costs are repaid over a term of up to 20 years. PACE is based on the concept of special municipal tax districts. PACE districts are established

⁴ PA Dept. of Economic and Community Development, 2015: Pollution Prevention Assistance Account Program (PPAA)

at the local government level to issue loans to residential and commercial property owners who would like to make a voluntary effort to implement energy efficiency retrofits or install small renewable energy systems. With property tax financing, the loan payments take the form of an assessment added to (but separate from) the property tax on the home or building. The financing and repayment stays with the building upon sale, enabling larger energy efficiency retrofits with longer payback periods to be built because property owners are not obligated to maintain ownership for the full payback period. PACE can be used for commercial and residential (though currently there are federal limitations to residential programs) and can work well with multi-family dwellings. More recent versions of PACE finance have allowed third-party lenders to provide capital, reducing the burden on debt-laden municipalities and enabling the bond to be brought to market in a more-timely manner. The senior lien of the tax obligation, coupled with property securitization and the well-documented technical performance of energy efficiency investments, have attracted numerous private sector entities to the PACE market.

The data in Figure 1 show the total number of commercial PACE projects and average value of projects provided by PaceNow.⁵ Nationally, over 327 commercial PACE programs have been initiated.

Figure 1



The Connecticut CPACE Program has allocated \$65 million in capital for over 60 projects with the average energy efficiency projects achieving 20 - 40% energy savings and solar projects delivering 50% - 90% energy cost savings.⁶ For Pennsylvania, the assumption is that 100% of CPACE projects would be enabled through municipal districts, but funded by third-party capital.

⁵ Pace Now, 2010: Pace Market Dashboard

⁶ Bridge Port News, 2015: C-PACE Marks Successful First Two Years. March 13, 2015

Table 2 Calculations assume funding levels comparable to Connecticut’s CPACE program and national figures provided by PaceNow.

Table 2 : Potential CPACE in Pennsylvania			
Project Size	Number of Projects	Project Distribution	Potential PA Program
\$1,000,000	16	9.2%	\$16,468,000
\$750,000	8	4.6%	\$6,175,500
\$425,000	39	11.6%	\$16,575,000
\$200,000	115	74.6%	\$23,000,000
Total Potential PA Program = \$ 62,218,500			

A Green Bank for PA- A green bank is a public or quasi-public financing institution that provides low-cost, long-term financing support deployment of clean, low-carbon projects by leveraging public and/or private funds. A green bank may conform to a variety of structures, utilize many different public (or private) funds, and create a diverse array of financial products. In general a green bank could serve to encourage a shift from one-time subsidies and grants towards market-catalyzing financial tools and propel innovation in policy, incentive structures, financial tools, and marketing. Green bank finance enables a return on investment for tax payer-supported capital (as opposed to grants) and has delivered up to a 10:1 leverage on capital.

Accelerating Energy Savings Performance Contracting - According to the American Council on an Energy-Efficient Economy (ACEEE) “State and Utility Pollution Reduction Calculator” (SUPR),⁷ energy savings performance contracting programs in Pennsylvania have the potential to achieve eight (8) percent of EPA’s Clean Power Plan required emissions reductions, and save over \$2.6 billion through energy efficiency measures by 2030. Table 3 shows the summary results for Pennsylvania from the SUPR tool which assumes performance contracting in the traditional MUSH market, as well as the private commercial sector. According to SUPR, the size of the program in Pennsylvania is based on historic ESCO market growth trends of 8.3% annually.

⁷ ACEEE, 2015: The State and Utility Pollution Reduction (SUPR) Calculator. April 21, 2015

Table 3 : Pollution Reductions from Energy Savings Performance Contracting in PA
Summary results

	2020	2025	2030
Cumulative NOx reductions (tons)	4,200	10,400	19,700
Cumulative SO2 reductions (tons)	12,200	30,200	57,200
Cumulative CO2 reductions (tons)	6,743,000	16,775,000	31,721,000
Annual CO2 reductions (tons)	1,570,000	2,338,000	3,484,000
Cummulative net cost (million 2011\$)	686	1,687	3,112
Cumulative energy saved (MWh)	7,894,100	19,638,100	37,135,000
Annual energy saved (MWh)	1,838,000	2,737,000	4,078,000

* Results are for all selected measures combined reported cumulatively.

Implementation Steps:

- Energy Savings Performance Contracting:
 - Promote funding for ESPC program through the PennSEF program and appropriations process.
 - Ensure the state government has expert and technical resources available for state and local governments and school districts to utilize in order to provide non-biased facilitation and information services about ESPC contracts.
 - As part of the technical resources, ensure the Commonwealth provides model documents and a standardized process for procuring and contracting energy efficiency projects. These model documents should be developed in cooperation with ESCOs in order to ensure financial feasibility and consumer protection.
 - Implement an outreach program together with PA Treasury to facilitate widespread deployment of the PennSEF programs.

- Create a Green Bank or similar entity to provide a clearinghouse for state led energy financial mechanisms which can evaluate energy funding opportunities vs. public and private financing opportunities
 - Evaluate all financing programs currently available (Figure 3) to determine what current financial assistance opportunities may have energy efficiency outcomes or correlating uses which may result in further leverage for energy funding opportunities.
 - Consolidate appropriate state energy grant and loans making authority from existing dispersed system to the Green Bank.

- Pass legislation to allow for voluntary development of CPACE, to enable low-cost, property-secured financing for efficiency improvements at commercial and industrial facilities.

Cost Estimates:

In order to create a measurable impact in the public and private marketplace through energy efficiency financing programs, a suggested baseline size of programs is suggested herein to provide a relative scale regarding public and private funding support necessary to implement the Program discussed.

- \$60 Million to support a CPACE program, funds anticipated to be provided mainly from private sector investment. A small percentage of funding, 1%, is provided by public funds for support of investment grade audits or cost share for implementation to help attract candidate projects and spur implementation.
- \$50 Million to support PennSEF program and supporting GESA and ESPC contracts. This initial funding is anticipated to be supported with public sector funds (e.g. municipal bonds) and private funding for projects aimed at the Municipal, University, Schools and Hospital (MUSH) sectors. Additional funding could come from other sources of public/state funding to provide for further implementation of deeper energy savings and cover initial costs.
- \$70 Million in public sector funds for initial development of a Green Bank capitalization. The goal of a Green Bank would be to leverage 10:1 the initial investment for a potential impact of \$700 Million. The initial funds could potentially be raised through the use of state acquisition of public sector bonding authority such as qualified energy conservation bonds (QECB's) allocated to Pennsylvania municipalities that are yet to be unused. As of December 2014, Pennsylvania has approximately \$87 million in remaining QECB allocations.⁸

GHG Reductions Estimates:

This plan does not include GHG reduction estimates due to uncertainties in funding availability, program design and the resultant difficulty in quantifying the reductions based on those variables.

⁸ EPC, 2014: Qualified Energy Conservation Bonds (QECBS). December 2014

Figure 2 – McKinsey GHG Abatement Curve for US⁹

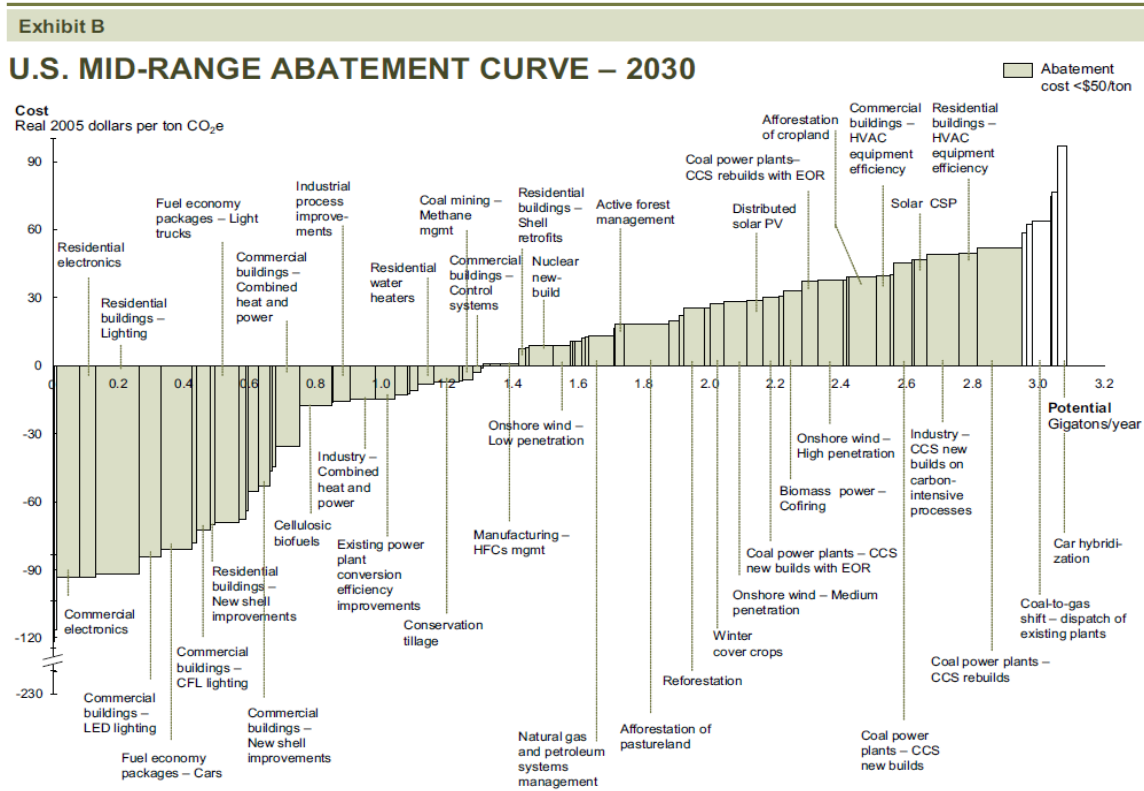


Figure 3 New PA Business Financing Matrix¹⁰

Program Title	FUNDING TYPE					FUNDING APPLICANTS & BENEFICIARIES			
	Grant	Loan	Loan Guarantee	Tax Credit	Bonds	Business	Community/ Nonprofit	Local Governments	Program Website
Abandoned Mine Drainage Abatement and Treatment Program (AMDATP) – Act 13	☑					☑	☑	☑	newPA.com/amdatp
Alternative and Clean Energy Program (ACE)	☑	☑	☑			☑	☑	☑	newPA.com/ace
Baseline Water Quality Data Program – Act 13	☑					☑	☑	☑	newPA.com/bwqdp
Ben Franklin Technology Partners Challenge Grant & Alt. Energy Dev Prog (AEDP)	☑					☑			newPA.com/challenge
BFTDA – University Research Commercialization Grant Funding	☑					☑	☑		newPA.com/bftda-university
Broadband Outreach & Aggregation Fund (BOAF)	☑					☑	☑		newPA.com/boaf
Building PA		☑				☑			newPA.com/building-pa
Business in Our Sites Grants and Loans (BOS)		☑				☑	☑		newPA.com/bos
Business Opportunities Fund (BOF)		☑				☑	☑		newPA.com/bof
Community Economic Development Loan Program (CED)		☑				☑			newPA.com/ced

⁹ McKinsey & Company, 2015: Reducing US Greenhouse Gas Emissions: How Much at What Cost?

¹⁰ PA Dept. of Economic and Community Development, 2014: Pennsylvania, Built to Advance, Business Assistance.

Program Title	FUNDING TYPE					FUNDING APPLICANTS & BENEFICIARIES			
	Grant	Loan	Loan Guarantee	Tax Credit	Bonds	Business	Community/ Nonprofit	Local Governments	Program Website
Discovered and Developed in PA Program (D2PA)	👑					👑	👑	👑	newPA.com/d2pa
Educational Improvement Tax Credit Program (EITC)				👑		👑	👑		newPA.com/eitc
Export Financing Program		👑				👑			newPA.com/efp
Film Tax Credit Program				👑		👑			newPA.com/film
First Industries Fund (FIF)		👑	👑			👑			newPA.com/fif
Flood Mitigation Program (FMP)	👑					👑	👑	👑	newPA.com/fmp
Global Access Program (GAP)	👑					👑			newPA.com/gap
Greenways, Trails and Recreation Program (GTRP) – Act 13	👑					👑	👑	👑	newPA.com/gtrp
Guaranteed Free Training Program (GFT-WEDnetPA)	👑					👑			newPA.com/gft
High Performance Building Program (HPB)	👑	👑	👑			👑			newPA.com/hpb
Historic Preservation Tax Credit (HPTC)				👑		👑			newPA.com/hptc
Industrial Sites Reuse Program (ISR)	👑	👑				👑	👑	👑	newPA.com/isr
Infrastructure and Facilities Improvement Program (IFIP)	👑					👑	👑	👑	newPA.com/ifip
Job Creation Tax Credits (JCTC)				👑		👑			newPA.com/jctc
Keystone Innovation Network (KIN)	👑					👑	👑		newPA.com/kin
Keystone Innovation Zone Tax Credit Program				👑		👑			newPA.com/kiztc
Keystone Opportunity Zones (KOZ)				👑		👑			newPA.com/koz
Keystone Special Development Zone (KSDZ)				👑		👑			newPA.com/ksdz
Multimodal Transportation Fund	👑					👑	👑		newPA.com/multimodal
Machinery and Equipment Loan Fund (MELF)		👑				👑			newPA.com/melf
Marketing to Attract Tourists	👑					👑	👑		newPA.com/marketing-tourists
Neighborhood Assistance Program (NAP)				👑		👑	👑		newPA.com/nap
Neighborhood Assistance, Enterprise Zone Tax Credit (NAP/EZP)				👑		👑			newPA.com/napezp
New PA Venture Capital Investment Program		👑				👑			newPA.com/venture-capital-investment
Opportunity Scholarship Tax Credit Program (OSTC)				👑		👑	👑		newPA.com/ostc
Orphan or Abandoned Well Plugging Program (OAWP) – Act 13	👑					👑	👑	👑	newPA.com/oawp
Partnerships for Regional Economic Performance (PREP)	👑					👑	👑		newPA.com/prep

Program Title	FUNDING TYPE					FUNDING APPLICANTS & BENEFICIARIES			
	Grant	Loan	Loan Guarantee	Tax Credit	Bonds	Business	Community/ Nonprofit	Local Governments	Program Website
PEDFA Tax Exempt Bond Program					👑	👑	👑		newPA.com/pedfa-tax-exempt-bond
PEDFA Taxable Bond Program					👑	👑	👑		newPA.com/pedfa-taxable-bond
Pennsylvania Capital Access Program (PennCAP)			👑			👑			newPA.com/penncap
Pennsylvania Community Development Bank Loan Program (PCD Bank)		👑				👑	👑		newPA.com/pcdbank
Pennsylvania First	👑	👑	👑			👑			newPA.com/pafirst
Pennsylvania Industrial Development Authority (PIDA)		👑				👑	👑		newPA.com/pida
Pennsylvania Infrastructure Bank (PIB) (PA Dept of Transp Program)		👑				👑	👑	👑	newPA.com/pib
Pennsylvania Infrastructure Technology Alliance (PITA)	👑					👑			newPA.com/pita
Pennsylvania Minority Business Development Authority (PMBDA)		👑				👑			newPA.com/pmbda
Pennsylvania Small Business Credit Initiative (SSBCI)		👑				👑			newPA.com/ssbci
Pollution Prevention Assistance Account Program (PPAA)		👑				👑			newPA.com/ppaa
Regional Investment Marketing (RIM)	👑					👑	👑		newPA.com/rim
Renewable Energy Program – Geothermal and Wind Projects	👑	👑	👑			👑	👑	👑	newPA.com/renewableenergy
Research and Development Tax Credit (R&D)				👑		👑			newPA.com/rd
Second Stage Loan Program			👑			👑			newPA.com/second-stage-loan
Small Business First (SBF)		👑				👑			newPA.com/sbf
Solar Energy Program (SEP)	👑	👑	👑			👑	👑	👑	newPA.com/sep
Tax Increment Financing Guarantee Program			👑			👑			newPA.com/tif
The Pennsylvania Regional Center – New American Development Fund		👑				👑			newPA.com/nadf
Water Supply and Wastewater Infrastructure Program (PennWorks)	👑	👑				👑	👑	👑	newPA.com/pennworks
Watershed Restoration and Protection Program (WRPP)	👑					👑	👑	👑	newPA.com/wrpp