

Case Study

**Home-Efficiency
Financing with Sealed
And NY Green Bank**

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Acknowledgments

This work was supported by Yale Center for Business and the Environment.

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The authors were advised by Jeffrey Schub, Executive Director of Coalition for Green Capital, and Stuart DeCew, Program Director of Yale Center for Business and the Environment. The report was edited by Kat Friedrich, News Editor at Clean Energy Finance Forum at Yale Center for Business and the Environment. The graphic design was created by Henk van Assen, Senior Critic at Yale University School of Art, together with Igor Korenfeld and Meghan Lynch, Designers at HVADESIGN. The authors thank these individuals for their valuable insights, support, and assistance.

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November 15, 2017

Table of Contents

- Executive Summary 4**
- Problem 6**
 - POLICYMAKERS CREATE CONDITIONS FOR INNOVATION THROUGH REV AND NY GREEN BANK. 6**
- High Electricity Prices Present an Opportunity 7**
 - ENERGY-EFFICIENCY-FINANCING OPTIONS EXIST CURRENTLY 7**
 - RESIDENTIAL ENERGY-EFFICIENCY MARKETS ENCOUNTER BARRIERS 9**
 - Consumer Barriers 10
 - Contractor Barriers. 10
 - Market Barriers. 11
- Solution 11**
 - SEALED ENTERS THE MARKET 11**
 - SEALED ENTERS INTO A LOAN AGREEMENT WITH NYGB 12**
 - SEALED CREATES A BUSINESS MODEL 14**
 - Customer Acquisition Process 14
 - Financing Features and Cash Flows. 16
- Recommendations 19**
- Appendix 21**
 - PROCESS DIAGRAMS 21**
 - INSURANCE DIAGRAM 22**

Executive Summary

NY Green Bank (NYGB), New York State's \$1-billion clean-energy fund, and a young new efficiency company named Sealed signed a \$5-million loan-financing agreement as a way to broaden the market for home energy-efficiency upgrades.

In New York State, those upgrades face two key barriers to widespread adoption.

The first barrier is that a whole-home upgrade is a high out-of-pocket investment for a homeowner. Homeowners who make upgrades often have to pay cash outright or take out loans to spread the cost over time.

Second, while large-scale investors are increasingly familiar with residential energy-efficiency financing, they don't use energy savings in their underwriting criteria. So the cost per project can be too low for significant resources to be dedicated to vetting each one. Plus, the methods of energy-efficiency upgrades have not been systematized enough for large investors to be comfortable providing pools of capital that would cover whole portfolios of households.

NYGB and Sealed entered the loan agreement to find a solution to these challenges.

The agreement between NYGB and Sealed addresses the first issue via Sealed's business model, which makes the process as easy and affordable as possible for the homeowner.

Sealed pays for the bulk of a household's efficiency upgrades and often takes over as the billing agent for the homeowner's utility bills. The homeowner pays Sealed a monthly bill that covers the efficiency investment and—in cases when it acts as the billing agent—the customer's energy use.

Before NYGB was involved, Sealed offered upgrades that homeowners financed with either upfront payments or extended loans. NYGB's financing allowed Sealed to start the new program, "HomeAdvance," as a billing intermediary.¹

NYGB's investment establishes a loan-performance history for residential energy efficiency by demonstrating to larger capital providers that efficiency upgrades can generate steady and predictable cash flows. The deal is large enough to finance upgrades for approximately 400 households—an adequate volume to be pooled together and securitized or sold to a long-term investor if the projected cash flows meet expectations.²

To clarify, NYGB did not invest in Sealed *as a company* the way a venture capitalist would invest. Instead, NYGB capitalized *as a separate project entity* (a "Special Purpose Vehicle" or SPV). The SPV both finances the efficiency upgrades and manages billing and loan repayment.

1 Frank, Andy. Personal interview. Dec. 16 2016.

2 Davidson, S. and McCartin, A. Personal interview. Dec. 1 2016.

Sealed instead manages the process of recruiting homeowners to join, working with contractors to make upgrades, and using data analytics to calculate billing and payment schedules. If Sealed goes bankrupt, the SPV is contracted to find an alternate billing service agent and would still generate cash flows. It is a project-finance-loan investment that should generate steady cash flows, not a risky equity investment.

The capitalization of SPVs is a fairly standardized process in project financings and is a structure that NYGB utilizes frequently. This includes funding SPVs for other technologies like wind and solar. In the case with Sealed, it employed that same kind of deal structure for energy efficiency, which was a first.

To guide other green-bank-like entities that are familiar with the deployment of debt financing to help stand up large-scale generation projects, this case will show how a similar structure can be used for residential energy efficiency.

Problem

POLICYMAKERS CREATE CONDITIONS FOR INNOVATION THROUGH REV AND NY GREEN BANK

New York is one of the states with the largest total demand for electricity in the country. The retail electricity market in the state was deregulated in the late 1990s by the New York Public Service Commission (NYPSC). The generation mix is primarily natural gas, nuclear power, and hydropower, according to the Energy Information Administration. Together, this makes up roughly 9/10 of the electricity generation.³

As states like New York look to further reduce climate-changing greenhouse-gas emissions from the electricity sector and foster more dynamic customer interactions with the power grid, new challenges have arisen for the sector.

In 2014, Governor Andrew M. Cuomo put forth his Reforming the Energy Vision (REV) strategy to fundamentally transform and modernize New York's energy system to ensure clean, affordable, and reliable electricity service in the decades ahead. This initiative includes funding for innovative companies and technologies working on renewable energy and energy efficiency.

The NYPSC and the New York Energy Research and Development Authority (NYSERDA) are the organizations bringing about improvements under REV.

NYGB was approved by the NYPSC in December 2013.⁴ The bank was capitalized with a total of \$1 billion in funds and is a division of NYSEDA. NYGB is a portion of NYSEDA's Clean Energy Fund, which is dedicated to clean-energy-market growth and innovation.⁵

The mission of NYGB is to "[collaborate] with private-sector market participants; [implement] structures that address gaps and overcome barriers in current clean-energy financing markets; and [transform] those markets by enabling greater scale, new and expanded asset classes, and greater liquidity."⁶

NYGB does not have a mandate to support a specific set of financing structures. It operates in wholesale markets and does not provide retail loans or directly lend to consumers. This flexibility allows it to support a range of initiatives, operating where market participants are facing financing barriers and addressing those barriers with scalable solutions.

3 "New York State Profile and Energy Estimates." *United States Energy Information Administration*. Retrieved from <https://www.eia.gov/state/analysis.php?sid=NY>

4 "NY Green Bank." *United States Department of Energy*. Retrieved from <http://www.energy.gov/savings/ny-green-bank>

5 "Reforming the Energy Vision: Clean Energy Fund." *New York Green Bank*. Retrieved from <https://www.nyserda.ny.gov/-/media/Files/About/Clean-Energy-Fund/clean-energy-fund-fact-sheet.pdf>

6 "New York Green Bank Mission." *New York Green Bank*. Retrieved from <http://www.greenbank.ny.gov/About/Mission>

High Electricity Prices Present an Opportunity

While New York's competitive retail market has allowed ratepayers the ability to choose their providers of energy, the state's electric rates are still the fourth highest in the country.⁷ Energy-efficiency improvements in New York therefore present a greater opportunity for homeowners to realize savings compared to those in other states.

However, the volumetric portion of a customer's energy bill—the charge for the energy itself—is only a portion of the total bill, which also includes delivery and service charges used by utilities to recover infrastructure costs. Residential efficiency investments therefore can only create savings on the volumetric charges; they do not cut back on all of the costs of electricity.

While the NYGB-Sealed agreement contains no geographic restrictions, to date, Sealed's projects have primarily been within utilities in the New York City metro area, particularly PSEG-Long Island, Con Edison, and Orange & Rockland Utilities. Sealed also covers areas in the Central Hudson region and the cities of Syracuse, New York, and Binghamton. Residential electric rates vary by month, but generally the total volumetric rates for supply and delivery in PSEG-Long Island and Con Edison territory approach \$0.20/kWh.

Both utilities also offer peak and off-peak rates that are labeled as time-of-use, but none of the Sealed customers are using time-of-use rates yet.

PSEG also has an additional rate option based on water- and space-heating methods and energy-storage systems. It is not clear how many customers fall within each rate category or how many customers in these areas purchase electricity from other retail providers.

Ultimately, the complexity around rates can make it more difficult for customers to understand how to realize energy savings from efficiency investments. Thus there is an opportunity in these two utility service territories for innovative financing that allows customers to more easily see savings from energy upgrades.

ENERGY-EFFICIENCY-FINANCING OPTIONS EXIST CURRENTLY

There is a diversity of energy-efficiency-financing options provided by federal and state programs, electric utilities, and private companies to customers living in the areas where Sealed is looking to expand.

At the state level, NYSERDA administers several innovative programs to help customers finance upgrades.⁸ Utilities like PSEG and Con Edison collect System Benefits Charges (SBCs) and use them to support

⁷ "State Electricity Profiles." *United States Energy Information Administration*. Retrieved from <http://www.eia.gov/electricity/state/>

⁸ "Home Energy Efficiency Programs." *New York State Energy Research and Development Authority*. Retrieved from <http://www.nyserd.org/All-Programs/Programs/Home-Energy-Efficiency-Upgrades>

energy-efficiency rebate programs. A list of relevant public and utility-based financial support options is summarized in Figure 1 below.⁹

Programs that offer financing are a form of competition for independent companies like Sealed. Meanwhile, rebates and incentives complement the financial tools that companies of this type provide.

ADMINISTRATOR	PROGRAM NAME	FUNDING SOURCE	FINANCING MECHANISM	LOAN TERM	AMOUNT
NYSERDA	Home Performance with ENERGY STAR	EEPS/Regional Greenhouse Gas Initiative (RGGI)	On-Bill Financing ¹⁰ or Smart Energy Loan ¹¹	3.49% APR	\$1,500–\$25,000
NYSERDA	Assisted Home Performance with ENERGY STAR	EEPS	Incentive	-	Up to \$4000
NYS Office of Real Property Tax Services	Energy Conservation Improvements Property Tax Exemption	-	Property Tax Incentive	-	100%
Various NY Utilities	Residential EE Rebate Program ^{12, 13, 14}	SBC	Rebate	-	Varies Based on Technology
NYSERDA	Multifamily Performance Program	EEPS/RGGI	Grant	-	-
Town of Babylon	Long Island Green Homes Program	Solid Waste Fund	PACE	-	Up to \$12,000
Municipalities	PACE Financing	Private Funding, Enabled by Tax Legislation	PACE	Varies Based on Locality	-
Federal Government	FHA PowerSaver Loan Program	Federal Funding	Loan	4.99%–9.99%	\$7,500–\$25,000
Federal Government	Energy-Efficient Mortgages	Federal Funding	Loan	Depends on mortgage	Up to \$8,000

Figure 1. Energy Efficiency Financing Options in New York

⁹ For a continually-refreshed and more comprehensive list covering all residential efficiency policies (with rural and multifamily programs included), visit <http://programs.dsireusa.org>

¹⁰ Paid directly to utility

¹¹ Paid to NYSEERDA loan servicer

¹² “PSEG Long Island - Residential Energy Efficiency Rebate Program.” *Database of State Incentives for Renewables & Efficiency*. Retrieved from <http://programs.dsireusa.org/system/program/detail/2003>

¹³ “NYSEG (Electric) - Residential Efficiency Program.” *Database of State Incentives for Renewables & Efficiency*. Retrieved from <http://programs.dsireusa.org/system/program/detail/49556>

¹⁴ “ConEd (Electric) - Residential Energy Efficiency Incentives Program.” *Database of State Incentives for Renewables & Efficiency*. Retrieved from <http://programs.dsireusa.org/system/program/detail/3797>

Private options include banks that offer loans for energy-efficiency upgrades that are secured against existing equity. Energy audits and installations are often made by separate companies like local contractors. When the energy contractor and financing steps are not integrated as parts of a single service, the customer must seek out both installers or contractors and the bank that will secure a loan.

There are additional efforts at the institutional level to increase investment. The Warehouse for Energy Efficiency Loans (WHEEL) program, for example, is a program that purchases pools of efficiency loans and securitizes them, unlocking additional capital for efficiency investment.¹⁵

RESIDENTIAL ENERGY-EFFICIENCY MARKETS ENCOUNTER BARRIERS

A 2012 Navigant report measured the annual nationwide residential efficiency market at \$14 billion, predicting a rise to \$84 billion by 2020.¹⁶

The national energy-efficiency market, including commercial and industrial, was sized at over \$100 billion in annual originations in 2015, according to a 2016 report by American Council for an Energy-Efficient Economy.¹⁷ Globally, the 2016 Energy Efficiency Market Report published by the International Energy Agency estimates “global investment in energy efficiency was \$221 billion in 2015, an increase of 6% from 2014.”¹⁸

Growing this market and encouraging consumer investment in energy efficiency will be challenging. Even environmentally-minded homeowners have hesitated to move forward with upgrades.

Yet, increasing the energy efficiency of existing buildings is a required action if the nation is to meet its climate goals. One estimate says that the annual rate of retrofits needs to at least double.¹⁹ Therefore, this market has potential for growth— but private investment activity is not at the scale that is needed.

Barriers to growth differ based on the market participant—from the consumer to the contractor to the financier.

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- 15 “Warehouse for Energy Efficiency Loans (WHEEL).” *National Association of State Energy Officials*. Retrieved from <http://www.naseo.org/wheel>
 - 16 “Residential Energy Efficiency Market to Reach Nearly \$84 Billion per Year by 2020.” *Navigant Research*. Retrieved from <https://www.navigantresearch.com/newsroom/residential-energy-efficiency-market-to-reach-nearly-84-billion-per-year-by-2020>
 - 17 Freehling, J., Stickles, B. “Energy Efficiency Finance: A Market Reassessment.” *American Council for an Energy-Efficient Economy*. Retrieved from <http://www.aceee.org/white-paper/ee-financing-market-reassessment>
 - 18 “Energy Efficiency Market Report 2016.” *International Energy Agency*. Retrieved from http://www.iea.org/eemr16/files/medium-term-energy-efficiency-2016_WEB.PDF
 - 19 Gottstein, M., Hamilton, B., Neme, C. “Residential Efficiency Retrofits: A Roadmap for the Future.” *Regulatory Assistance Project (RAP)*. Retrieved from <http://www.raponline.org/wp-content/uploads/2016/05/rap-neme-residentialefficiencyretrofits-2011-05.pdf>

Consumer Barriers

One key consumer barrier is the high transaction cost of making efficiency upgrades. The steps include hiring a contractor to do an energy audit, deciding on upgrades to make, and securing financing.

Consumers also may simply not view upgrades as a priority and therefore may never explore their options. Future cost savings may not be a sufficient motivator if so much upfront effort is required.

Consumers may also not be aware of the other benefits that accompany energy-efficiency installations—such as reduced drafts, improved home value, and decreased air pollution. If a homeowner is not pleased with how their home feels, they may not always know energy-efficiency upgrades would solve many of their problems.

There also are a number of consumers who are simply not aware that energy-efficiency investment is even an option. Or they may not be aware of the underperformance of their homes.

For consumers who do want to make an upgrade, the rates and upfront cost may be too high and deter those who have taken some of the first steps.

Additionally, the terms for financing may be too long for homeowners who may want to do additional renovations or sell the home within shorter time frames.

Furthermore, when comparing the cost of the loans with the expected savings from any given energy-efficiency upgrade, consumers may decide that the return is too low and not worth the effort or risk.

Renters also sometimes have a split-incentive problem. This occurs when the building owner makes the capital investment in efficiency, but the renter receives the benefits from the lowered utility bill. In situations where the building owners pay for the utility expenses, this incentive issue does not occur.

Contractor Barriers

An integrated barrier for consumers and contractors is a lack of contractor expertise. Contractors may specialize in a specific type of retrofit—such as heating, ventilation, and air conditioning (HVAC)—but be unable to provide information to consumers about how to tighten the envelopes of their homes.

Moreover, contractors may not all have the breadth of knowledge necessary to successfully implement energy-efficiency upgrades, so consumers may have a harder time making effective home improvements.

The relationship between homeowners and contractors can also be limited to emergency situations such as when boilers fail in the middle of the winter. In this case, the homeowners are likely not going to engage in discussions about the most efficient technology. Their priority will be to get replacement boilers as quickly as possible.

Market Barriers

Large private lenders are less active in the residential efficiency market than they might be otherwise for two main reasons. The first is that despite the number of homes with energy-efficiency-upgrade potential, the size of each individual project is too small to justify the costs of acquisition.

Second, even if the projects were of sufficient size, banks are new to the energy-efficiency space and often do not properly understand the level of risk and the selection of technologies. There is also a lack of historical data on how residential energy-efficiency upgrades perform. Thus, banks are likely setting interest rates higher relative to the risk of the assets, which makes energy-upgrade loans more expensive for consumers.

Novel financing structures have been introduced that aim to assuage customer worries about the payback time of investments and that eliminate the upfront-cost barrier. But energy-efficiency installations still have much room to grow.

Energy-efficiency technologies are understood and reliable. They would be prudent investments. Thus, green banks are well suited to supporting residential-efficiency-market growth and demonstrating projects' value to institutional investors.

Solution

SEALED ENTERS THE MARKET

Sealed was founded in 2012 by Andy Frank, who had recently sold Efficiency 2.0, an energy-efficiency-software company. It currently operates in the greater New York City area including Brooklyn, Long Island, Queens, and Westchester.

In Sealed's initial business model, the company created and guaranteed savings for homeowners by managing their energy-efficiency upgrades. However, homeowners had to pay cash or take out loans to pay for them.

According to market research done by Sealed, "Debt was a four-letter word." Homeowners were resistant to taking out loans for retrofits, despite the straightforward nature of the transactions.

Even though the homeowners would see savings, the hassle of applying for a loan, paying interest, and being tied to a bank may have created barriers for some customers.

Sealed discovered that customers were less motivated by the concept of savings over time and instead were comfortable with paying roughly the same monthly bills while receiving the added value from energy-efficiency retrofits. Customers were already accustomed to paying their energy bills, so a small variation in billing was an easier adjustment than taking out a loan. Avoiding debt removed the risk associated with borrowing money.

Sealed's approach was to work with potential customers to identify comfort issues such as drafts, temperature, and allergens and then to develop retrofit plans that would address those issues.

After testing out a few different models, Sealed decided upon a configuration where it now acts as the billing agent for the customers' electricity and heating bills. A homeowner pays a single bill to Sealed that covers both their monthly energy use and the cost of the upgrades. Put another way, customers engage in on-bill financing, except that instead of paying a bill to the utility, the customers pay their bills through Sealed. Since it is common for third parties to be billing agents, this arrangement did not require any special agreement with the utilities.

In order to implement this new billing and savings approach, Sealed needed financing to perform the energy audit and purchase the energy-efficiency equipment. The inherently unique configuration of an energy-efficiency retrofit and the associated difficulty of collecting performance data have historically limited the enthusiasm of private capital providers to finance installations.

This traps energy-efficiency companies in a loop where they are unable to get a low cost of capital because of a lack of data and cannot collect more data since they do not have the capital to make investments.

While some private capital providers were interested in financing the project, the loan amounts were limited and were offered at high interest rates.

Due to its experience as a clean-energy-project financier and familiarity with the residential energy-efficiency market, NYGB was willing to offer a larger loan at an interest rate that reflected the actual rather than perceived risks associated with this business model. By providing this support, NYGB took the initial risk on a novel billing arrangement and allowed Sealed to collect performance data to de-risk future investments.

Though there were alternative capital providers, NYGB's more-accurately priced cost of capital also allows Sealed to prove its model at a friendlier rate, which will help bring in additional investors at lower rates.

SEALED ENTERS INTO A LOAN AGREEMENT WITH NYGB

NYGB was a well-known entity in the market and Sealed decided it would be a good fit for financing. Like many organizations who submit applications through NYGB's open solicitation, Sealed had conversations with NYGB in advance in order to ensure its staff clearly understood NYGB's application criteria and evaluation processes.

NYGB has an ongoing solicitation posted on its website that states that applicants must **(a)** demonstrate a financing need, **(b)** explain that NYGB will provide additionality and is not just a substitute for another financier, **(c)** show what the specific finance structure will be, **(d)** discuss comparable transactions, **(e)** include technological considerations, and **(f)** consider clean-energy outcomes. Sealed submitted an application for financing.²⁰

²⁰ For the complete solicitation, see <https://greenbank.ny.gov/Working-with-Us/Propose-an-Investment>

The deal process went smoothly. Given that NYGB was already familiar with the inherent risks involved in businesses focused on energy efficiency and had experience in providing financing in that market segment while Sealed was poised for growth with a strong business model, the terms proposed by NYGB were agreed upon without difficult negotiations.

A revolving loan was created to support Sealed's projects. This allows Sealed to draw down a discrete, variable amount of capital for each project.

The total amount was a negotiated detail between Sealed and NYGB. It is based on the discounted value of the aggregate expected project cash flows. This helps Sealed manage cash flows since it only advances money based on the expected energy savings.

Sealed can draw down capital on a monthly basis at an amount based upon the cash flows of new projects it has recently placed in service. Overall, there is a finite length of time during which Sealed can draw from the facility.

The use of an SPV was chosen since there are more controls in place to protect the investors. In addition, there are tax benefits that can be collected using this type of arrangement. This thus facilitates participation of third-party capital.

A secured revolving-credit investment in an SPV was a familiar transaction for NYGB since it is closer to a project finance structure than a traditional finance structure. This helped the negotiations go smoothly.

The loan is secured with the use of a UCC-1 financing statement. This form states that Sealed has an interest in the personal property of the homeowner. This gives the debt a place in the capital stack at a lower priority than the mortgage.

One of NYGB's stated goals was helping evolve "private-sector institutional underwriting" in support of the deployment of clean-energy projects.²¹ To facilitate this, NYGB has conversations with private-capital providers to determine what level of financial returns would look attractive to investors in future rounds. That way, once the portfolio has performed for a period of time, outside investors will see that there is less risk and will step in and capitalize additional projects.

The main risk that NYGB needed to mitigate in the transaction with Sealed was the risk that the assets would not perform as projected. It worked with engineering experts at NYSERDA and independent engineers to evaluate Sealed's analytics platform.

Sealed developed an actuarial model that uses historical data on how homes use energy before and after retrofits occur. This mitigates the uncertainty around how individual technologies and behavior affect performance, capturing the broader energy usage.

By simplifying energy usage this way, Sealed does not have to be concerned about performance on a project-by-project basis, but instead focuses on energy savings at the portfolio level.

21 "Propose an Investment." *New York Green Bank*. Retrieved from <https://greenbank.ny.gov/Working-with-Us/Propose-an-Investment>

Effectively, the problem of replicating energy-efficiency results gets abstracted because validation data come from multiple sources. One is from previous Sealed installations. Another is from historical energy data that Sealed acquires and uses to tune its analytics engine so it can accurately predict expected savings. Sealed can then more easily determine what technologies are required to achieve the desired results. This does not eliminate risks around the upgrade performing as expected, either due to the equipment or the weather, but it minimizes the impact of errors.

Additionally, after the NYGB deal, Sealed obtained an energy-savings-insurance policy from Hartford Steam Boiler that also validates its analytical approach.

This report was written only a few months after the deal closed. Data on how the home retrofits financed by the credit facility have performed were not provided to the authors.

Sealed eventually wants to re-bundle and resell the portfolio of completed projects. It is in conversations with capital providers who may be buyers, but those connections are still in the early stages.

There was one complication that arose simultaneously with the deal process.

Sealed had initially filed for a trademark of the term, “Sealed PAYS” (“Pay As You Save”) to refer to its billing structure. A separate entity had already used the term “Pay As You Save” for a different type of energy transaction and requested that Sealed use something different.

Sealed decided to rebrand the product to “HomeAdvance” partly due to this issue—along with the fact that in conversations with customers, staff realized that the term “Sealed PAYS” highlighted billing, which is a logistical point. “HomeAdvance” instead highlights home comfort, a more positive value-add.

This anecdote is included to help readers have clarity in case they come across “PAYS” in relation to Sealed from initial media stories—and to point out that difficulties may arise independently of the business model and the financing.

SEALED CREATES A BUSINESS MODEL

Customer Acquisition Process

Sealed pursues customer leads via a variety of channels including field marketing (such as tabling at fairs, canvassing in communities, and tabling at local ACE Hardware stores); web-based outreach via search ads; constructive collaboration with contractors; and promotion through utilities who include advertisements in other outreach materials.

From that funnel of leads, the customers who are interested in working with Sealed fill out a quick form on their website. Then Sealed schedules a phone call with each customer as an initial screen to make sure the homeowner has problems that can be solved by a retrofit. These can include a variety of heating, cooling, or allergy issues.

If problems exist that can be solved by a retrofit, Sealed sends an “Energy Pro” to the house. The advisor spends about two hours examining the home. They create a floor plan, test the HVAC efficiency, inspect the insulation, conduct a blower-door test, and use a leak-detecting infrared camera. They also assess past energy use—which often involves requesting data from the homeowner’s electric, gas, and/or oil providers.

The data-request process sometimes involves logging into a customer account on the utility website with the homeowner’s username and password. Utilities without web interfaces have to be contacted directly. According to Frank, this can create a substantial inconvenience.

During the visit, Sealed then plugs all of the data into its energy and pricing model. It then gives a proposal to the homeowner showing **(1)** a list of what upgrades will be done, **(2)** the total cost of the upgrade, **(3)** the rebates that reduce the total cost, **(4)** the upfront cost the homeowner will need to pay, **(5)** the amount Sealed will pay, and **(6)** the monthly payment schedule.

If the customer agrees, then they sign the contract. The upgrades are made by a contractor working with Sealed. Then, Sealed takes over as a billing agent on the homeowner’s utility bills. Thus, the homeowner has the option to no longer pay their energy bills to utilities and can instead receive a bill from Sealed that

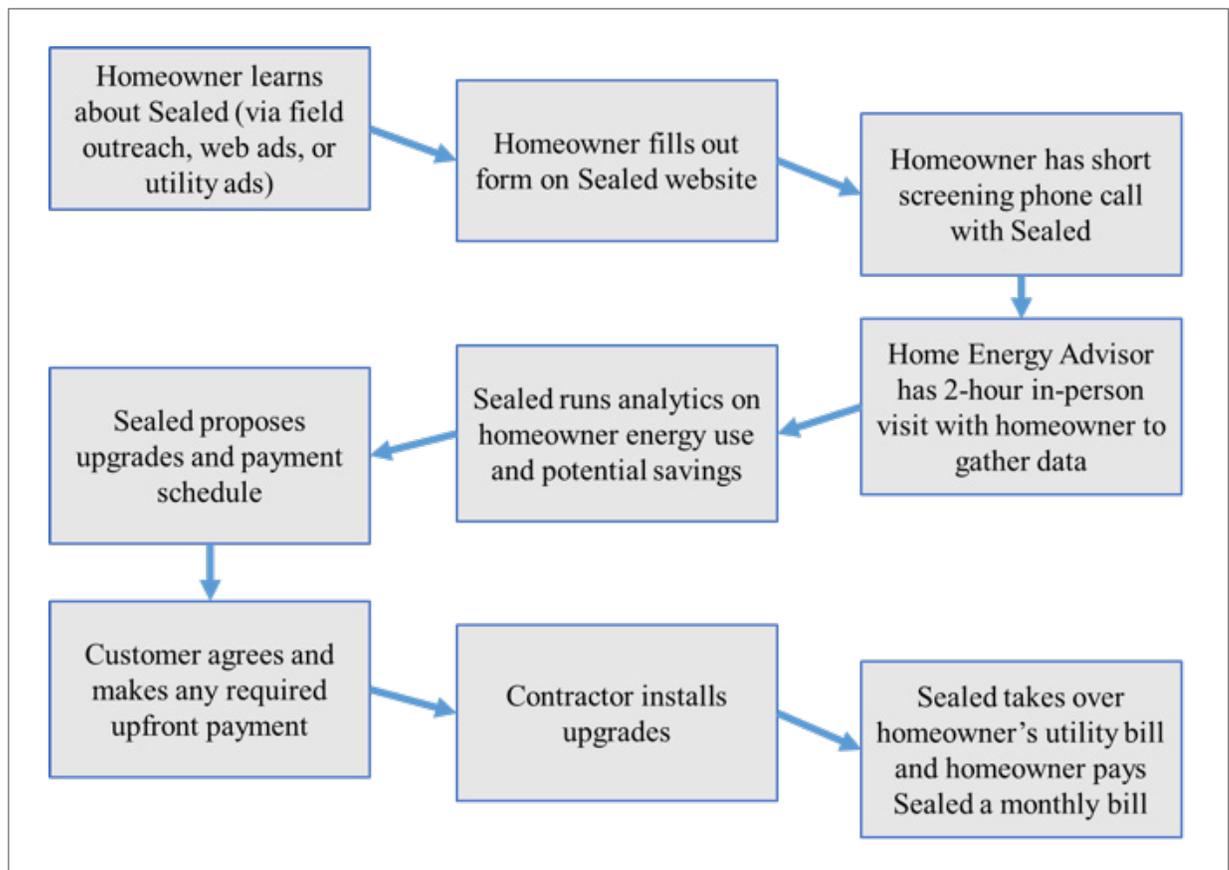


Figure 2. Homeowner Process

is split out into **(a)** their electricity bill and **(b)** the agreed-upon monthly amount which depends on savings and pays off the efficiency upgrades.

Sealed then pays the utility for the homeowner's energy use. A customer path is shown in Figure 2 above.

If the homeowner moves out of the house before the full repayment is complete, they must pay a set termination fee.

Financing Features and Cash Flows

THE \$5M SECURED REVOLVING-CREDIT FACILITY

The loan agreement with NYGB is for a \$5-million secured revolving-credit facility. Sealed files a UCC-1 form on each project to claim an interest in the property, since the energy-efficiency upgrades are an investment in that asset.

The NYGB loan is secured against those interest claims. The credit facility is "revolving" in the sense that when Sealed repays 100% of an advance while the facility is still available (during the finite "availability period"), it can draw those funds again for additional projects. Once the availability period ends, Sealed can still make repayments on outstanding advances, but it cannot access any further capital from the facility. NYGB can then reinvest the funds in new projects.

The loan agreement is also set up so the SPV does not advance the funds to the contractor until the upgrade is complete and its quality has been verified.

PROJECT FINANCE

Project finance is a legal-heavy financing approach, since the cash flows are de-risked as much as possible through a collection of contracts.

The Sealed SPV is a project-finance approach to funding efficiency upgrades.

The legal fees required for the deal negotiation can be high, but Sealed felt they were worth the cost.

If other green banks consider a similar deal, one cost to monitor will be the transaction cost of setting up a credit facility. It will also be important to assess how those costs compare to the deal size.

INSURANCE

Sealed entered an insurance agreement with a large provider to cover the energy-savings calculations at the portfolio level. Therefore, if the energy performance of homes differs drastically from their savings projections and Sealed is not able to earn back its full returns, this insurance policy will cover that risk.

In the deal with NYGB, this type of insurance was not required. However, it will increase future investors' confidence in the cash flows. Additionally, if a household sustains damages such as a fire, the homeowner's insurance will pay the Sealed SPV directly for their portion of the loss because of the UCC-1 that Sealed files.

ELECTRICITY PRICE RISK

Given that energy prices can change over time, sometimes suddenly, investors are typically worried about energy price risk affecting future cash flows.

To mitigate this risk, Sealed sets up its monthly billing structure to have the energy savings at a fixed price, usually with a 3% annual price escalator.

In other words, Sealed charges the homeowner for the saved energy at a fixed energy-reduction rate that increases each year by 3%. That payment is on top of their actual energy use cost, which passes through the SPV to the utility.

WAREHOUSING

Sealed is interested in bundling projects and reselling them to other investors.

Before this can happen, Sealed must collect performance data on the yields realized from energy savings, the consistency of the cash flows, the number of defaults, and the speed with which they can originate new deals. These metrics are all similar to what institutional investors would require from other structures. So ideally, market adoption should not encounter unusual hurdles. Sealed projects can be packaged into a warehouse facility and resold.

PROJECT COST AND CASH-FLOW ILLUSTRATION

To show how the costs of a project are broken out, this illustration shows a *hypothetical* home-upgrade project costing \$12,000.

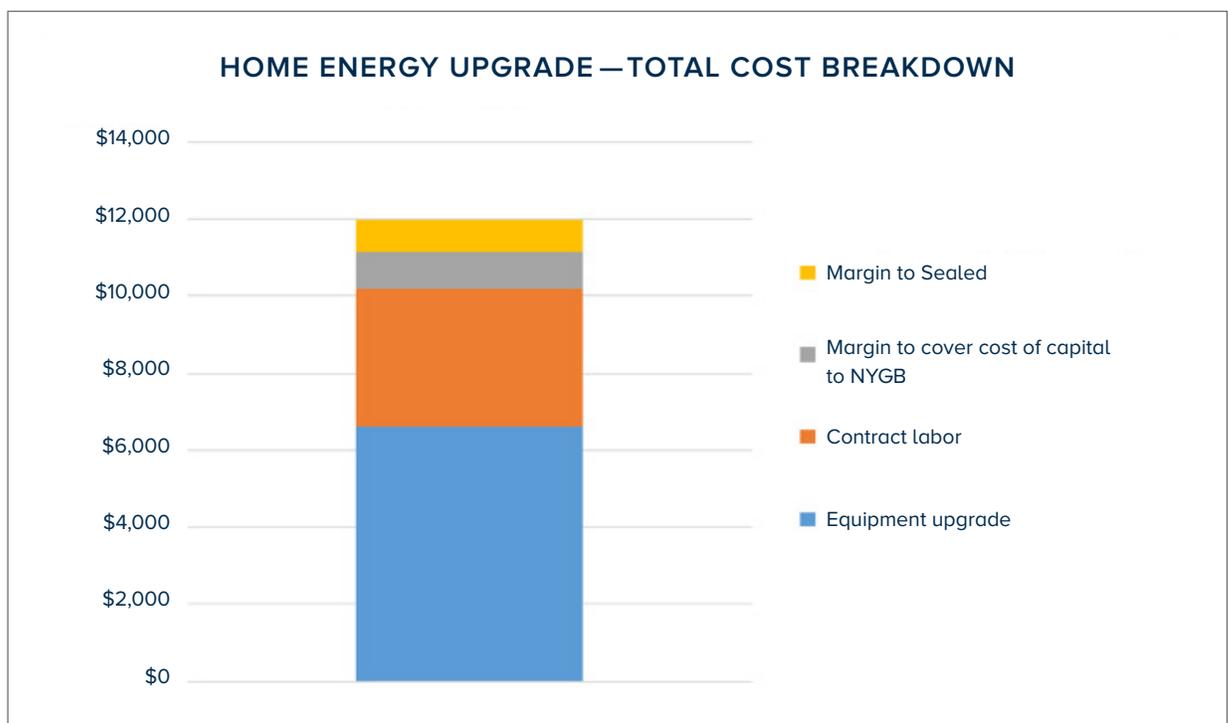


Figure 3. Cost Breakdown

1. Sealed gathers data from the homeowner and calculates the cost of an upgrade, in terms of equipment expenses and contractor labor costs. Then the staff add a small premium that will cover the cost of capital from the loan provided by NYGB and any others who put capital into the project via the SPV, such as Sealed itself. See Figure 3.
2. When the homeowner is deciding to sign the agreement, they only see the total \$12,000 cost, not the broken-out margins covering the cost of capital. Efficiency rebates are then applied to the equipment costs and the total cost is reduced (for illustration, it is a \$2,000 rebate). From that remainder, Sealed's offer may require the homeowner to put in an upfront payment (for illustration, it is also \$2,000). The other \$8,000 will be paid to the contractor initially by the SPV. See Figure 4.

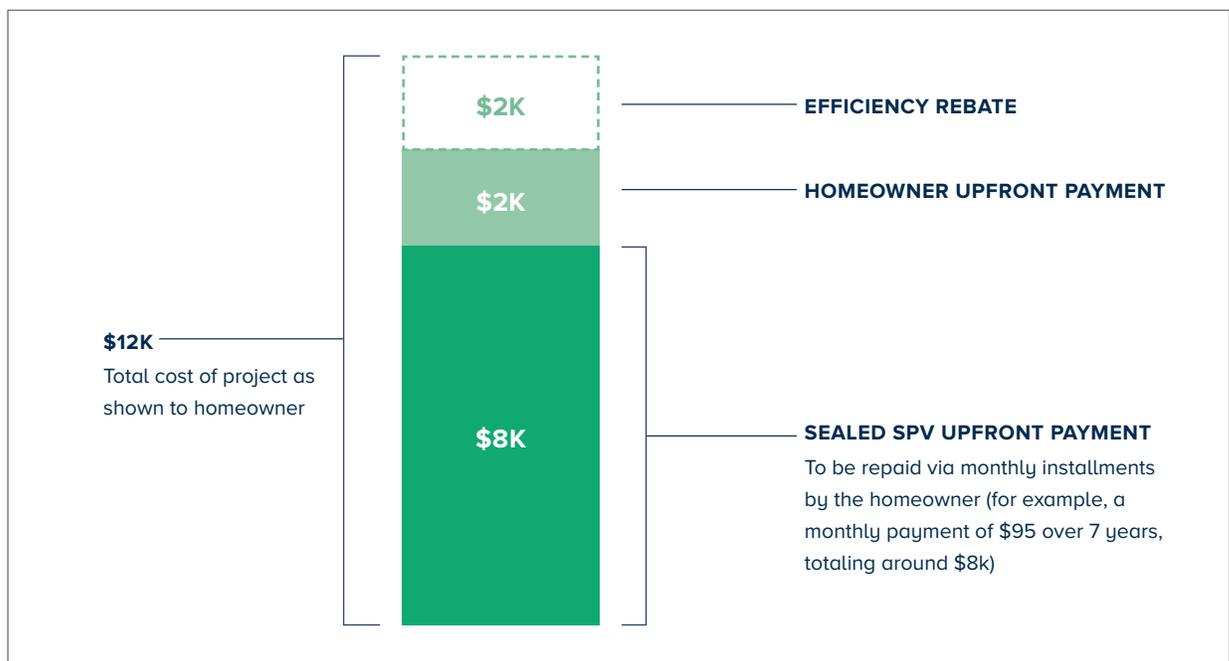


Figure 4. Breakdown of Hypothetical Project Costs.

3. The \$8,000 cost paid by the SPV is then turned into a variable, savings-based monthly payment that the homeowner pays over time on top of their payment to a utility. Then the total combined payments for electricity and heating fuel plus efficiency upgrades can be less than the bill would have been without any upgrades. In other words, the homeowner may see slight savings each month. However, the bill is only lower if energy prices are higher than the “savings price,” which is usually set as the 10-year average. Since energy use varies by season, the total monthly bill amount paid to Sealed will also vary. Note that a larger variable cost for energy use is passed through directly to the utility while a smaller percentage of the cost is retained by the SPV or used to repay investors. See Figure 5.

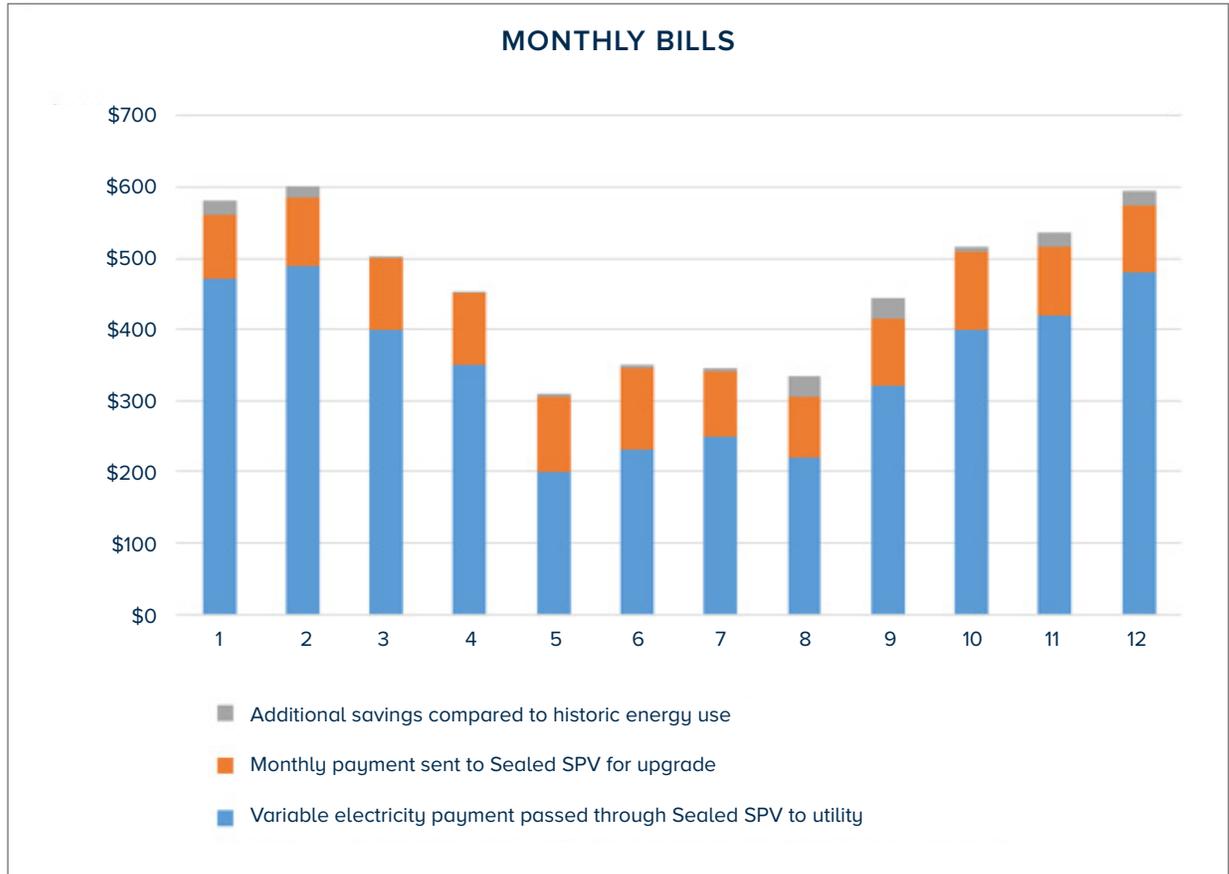


Figure 5. Hypothetical Annual Cash Flows

Recommendations

When green banks such as NYGB participate in transactions with energy-efficiency companies such as Sealed, these are opportunities to provide financing in an area that is underserved by private capital providers. Projects that reduce electricity demand and greenhouse-gas emissions while improving the comfort of consumers are critically important from a global perspective.

Reducing demand has a significant impact on electricity-generation requirements due to losses along the transmission and delivery system. Moreover, framing energy-efficiency upgrades as “increasing comfort” instead of “spending less each month on utility bills” may increase enthusiasm from consumers.

Thus, this deal has the potential to be duplicated by other green banks, whether they are at the county or country level. When considering supporting an energy-efficiency company, green banks should consider the following goals that can be accomplished.

- Structure contracts using similar terms to what private capital providers want to help facilitate the crowding-in of private capital in future transactions
- Apply finance structures and cash flows in a way that treats energy efficiency as an energy resource comparable to other sources of energy
- Position green banks to address market awareness gaps and centralized knowledge barriers via outreach both to the public and potential applicants
- Match cash flows with finance structures and loan contracts in order to lower the costs of capital
- Support collaborations between utilities and regulators to collect historic data
- Encourage applicants to explore insurance options that provide additional confidence about risk reduction
- Support projects that address thermal demands since the cash flows are larger and these improvements are more noticeable to consumers in terms of comfort when compared to LED replacements of incandescent or fluorescent lights
- Engage companies with utilities to co-brand since it brings an inherent level of trust

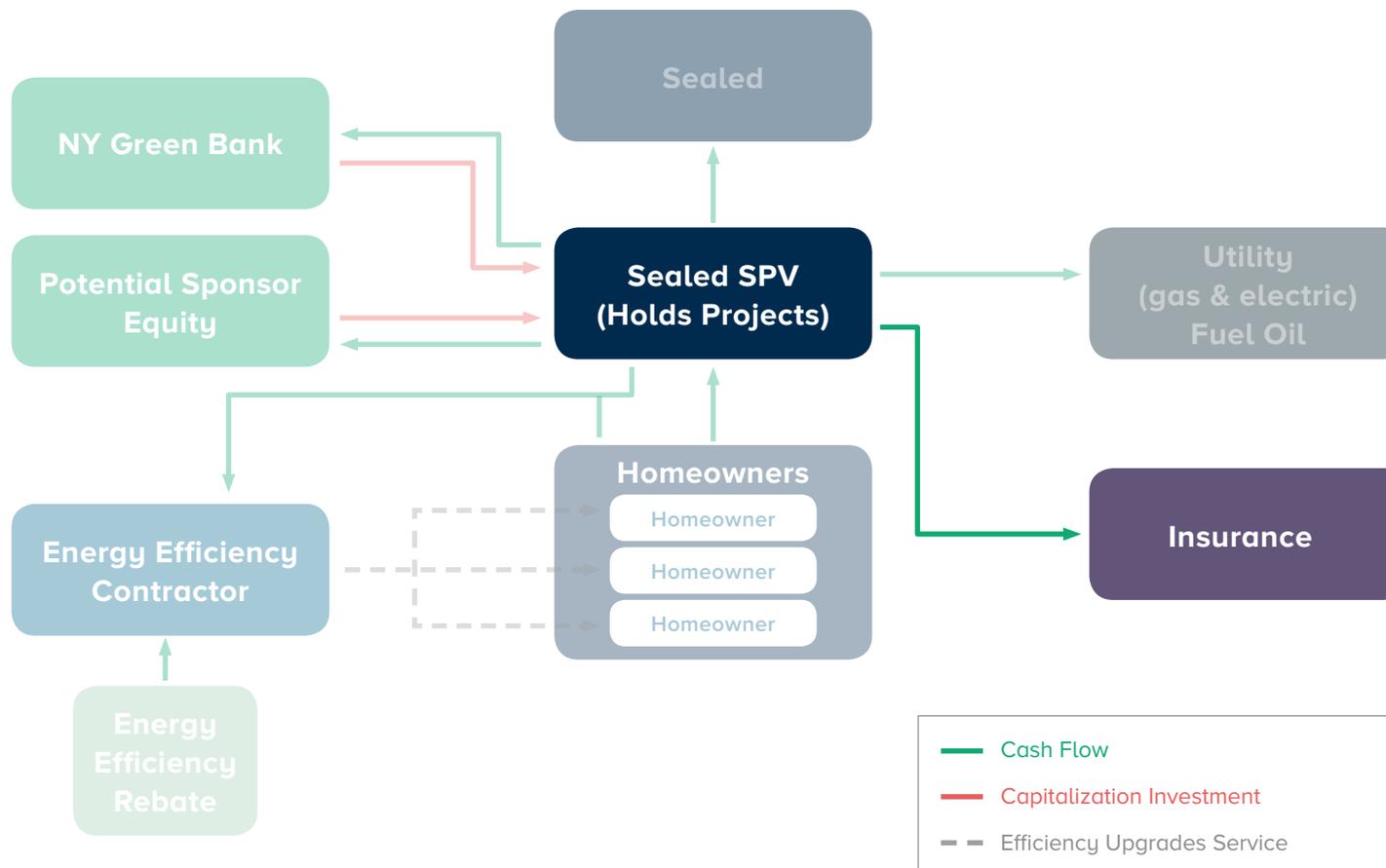
Energy-efficiency projects currently experience significant gaps in funding support. Part of this is due to the increase complexity of energy-efficiency projects, but these characteristics are not without solutions.

Green banks are well-suited to be capital providers for energy-efficiency projects, increase their deployment, and support collection of performance data so that private capital providers may step in and bring energy efficiency into the mainstream.

Appendix

PROCESS DIAGRAMS

INSURANCE DIAGRAM



Sealed is pursuing an insurance policy to cover energy-savings calculations at the portfolio level.

Sealed also has the right to file a property interest claim so that if a house burns down, the homeowner's insurance pays the SPV.