



ON-BILL REPAYMENT:

UNLOCKING THE ENERGY EFFICIENCY PUZZLE IN CALIFORNIA

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1. Background and Program Overview

1.A. Background

“Reduce high upfront costs and make it easy for homeowners to borrow money for home energy retrofits.”

- Recovery Through Retrofit¹

“...Engaging private banks to help assess individual customer credit risks and fund [on-bill finance] loans will provide programs with a new added source of capital that allows utilities to focus on program marketing, project evaluation and screening, and customer billing mechanisms.”

- CalCEF Innovations, Feb., 2010²

California has bold expectations for implementing cost effective energy efficiency in all new homes and commercial buildings.³ By 2030, half of commercial buildings are to be zero-net energy, while existing homes are to reduce energy use by 40 percent by 2020.⁴ One California Public Utilities Commission (CPUC) sponsored study estimates \$60 billion will be needed to reduce existing household energy use by 25 percent by 2020, an investment effort of over \$7 billion per year.⁵ No robust plan currently exists for funding these building retrofits.

On-bill repayment (OBR) will provide a way for lenders to invest private capital in building energy efficiency (EE) at competitive rates of interest and with long term repayment schedules. This will provide California building owners with access to substantially larger pools of capital than would be available through the public sector.

¹ *Recovery through Retrofit*. Rep. Council on Environmental Quality, Oct. 2009.

<http://www.whitehouse.gov/assets/documents/Recovery_Through_Retrofit_Final_Report.pdf>.

² Hinkle, Bob, and David Kenny. *Energy Efficiency Paying the Way: New Financing Strategies Remove First-Cost Hurdles*. Rep. CalCEF Innovations, Feb. 2010. <<http://www.fypower.org/pdf/CALCEF-WP-EE-2010.pdf>>.

³ CPUC, [Long-Term Energy Efficiency Strategic Plan](#). “The Big, Bold Energy Efficiency Strategies are:

1. All new residential construction in California will be zero net energy by 2020
2. All new commercial construction in California will be zero net energy by 2030
3. All existing residences will increase efficiency by 40 percent by 2020.
4. The Heating Ventilation and Air Conditioning (HVAC) industry and market will be
5. transformed to ensure that its energy performance is optimal for California’s climate
6. All eligible low-income customers will be given the opportunity to participate in low income energy efficiency programs by 2020”

⁴ As well, California intends to make energy efficiency certification and benchmarking standard practice for businesses.

⁵ *Energy Efficiency Financing in California*. Rep. The California Public Utilities Commission, Energy Division and Harcourt Brown & Carey, July 2011. <http://www.cpuc.ca.gov/NR/rdonlyres/BoEBFCA6-22B5-408D-96B8-6490A5A38939/0/EEFinanceReport_final.pdf>. Page 11, “...to achieve a 25 percent savings level in California’s homes, at a cost of \$7,200 per home, would require an estimated installed cost of approximately \$60 billion.”

OBR will overcome several barriers to EE investment:

- a) Energy users are reluctant to invest their own capital in EE projects, instead preferring zero initial cost financing structures. This is exacerbated in commercial and multi-family buildings, where misaligned or split incentives exist between building owners, who control building improvements, and occupants, who pay the energy bills.
- b) Longer term loans will be critical to financing deeper EE retrofits. By matching future savings with repayment obligation, an OBR program allows a current owner/tenant to consider projects with payback periods that may extend beyond the current ownership/tenancy.
- c) Both the lenders and building owners perceive risks associated with EE investments; they do not have confidence that the promised energy savings will be realized or, consequently, that the investment will provide attractive returns.

OBR enables longer term loans, with customers realizing benefits from day one. Lenders see the OBR mechanism as a key to high quality credit. Since building owners have a very strong incentive to pay their utility bills, lenders believe that a properly structured OBR program can greatly reduce the cost and increase the availability of credit.

1.B. Overview of On-Bill Repayment

An on-bill repayment program enables building owners to repay loans for eligible energy efficiency and renewable electricity generation projects through their monthly utility bills. The loans would be underwritten and financed by private, third-party capital, such as banks and credit unions. Energy efficiency contractors might provide their customers with an integrated package of upgrades and financing. An OBR program can be tightly included into existing utility energy efficiency programs and can be expected to improve the effectiveness of these programs.

For OBR, the utility's primary role would be billing and payment processing, but the utility could also be involved with marketing, qualification of contractors and project inspection.

A carefully constructed OBR program should provide several benefits for commercial building owners, homeowners and tenants:

Savings Matched with Costs – Customers will pay a single monthly bill for both energy and debt service that will be lower than their previous bills.⁶ This linkage should make it easier for customers to weigh the benefits of energy investments against anticipated savings.

Obligation Tied to Meter – The OBR program can be structured as a rate tariff that stays with the meter when the current owner or tenant moves. The current owner/tenant will not be responsible for making payments after moving or sale of

⁶ Repayment schedules can be massaged to match up with or offset seasonal trends.

property. There will be disclosure prior to sale of an affected property or a new rental agreement. The new tenant or owner would both benefit from the upgrade and be required to continue to make payments. Upgrades with long payback periods can be considered without worrying about sale or change in tenant.

Lower Rates and Better Terms - Default (i.e., nonpayment) rates on utility bills tend to be far lower than for other debts, such as mortgages and credit card balances. By utilizing this attribute of utility bills, lenders will be able to offer substantially lower rates, longer maturities and better terms for an OBR loan relative to conventional EE loans, which features shorter-term repayment periods and interest rates ranging from 10 to 20 percent.⁷

Flexibility - OBR can be designed to provide financing for commercial, public and residential buildings including multi-family rental buildings. Additionally, OBR will significantly improve the credit quality of a wide variety of financing mechanisms including loans, leases, Energy Services Agreements (“ESAs”) and Power Purchase Agreements (“PPAs”).

Environmental Defense Fund recently estimated that an OBR program in California could substantially lower borrowing costs for building owners, generate an estimated \$2.7 billion of third-party investment per year at program maturity, create 20,000 jobs and reduce annual CO₂ emissions by seven million tons after five years.⁸

Eligibility criteria and program rules can be developed to protect consumers, lenders, utilities and rate payers. Lenders, contractors and other vendors should be continually monitored to insure project quality, consumer satisfaction and to continually refine their skill in forecasting energy savings.

1.C. Example – A Single-Family Homeowner

An OBR financed installation of energy efficiency measures and renewable generation would involve several steps:

- A utility and/or an approved contractor identifies a project, and then helps the building owner apply for financing to pay for the upgrades. The loan is provided by an approved bank or other financial institution.
- A contractor provides the customer with an estimate of the expected monthly energy savings and up-front upgrade costs.
- If the loan is approved by the lender and borrower, the contractor executes the project.
- An expert, disinterested, objective third-party inspector (managed by either the utility or a government entity) validates the estimate of the projected savings and that the upgrades are properly installed. The program would require that projected savings exceed debt service, so the customer would see a reduction in their monthly utility bill.

⁷ *Energy Efficiency Financing in California*. Rep. The California Public Utilities Commission

⁸ Assumes \$2.7 billion invested per year for five years, 50% of project cost for labor and \$65,000 annual labor costs per employee.

- The homeowner pays a combined monthly bill for both energy and loan repayment.
- The utility will be responsible for processing the payments.
- Partial payments will be allocated proportionally between energy and debt service.
- All existing consumer protections will remain in place for delinquent energy accounts.

Financials

Current utility bill: \$350 per month

Investments: Solar panels, attic insulation, duct sealing, window sealing, HVAC controls and new refrigerator

Expected utility bill savings from investments: \$225 per month

Investment loan: \$20,000

Loan terms:

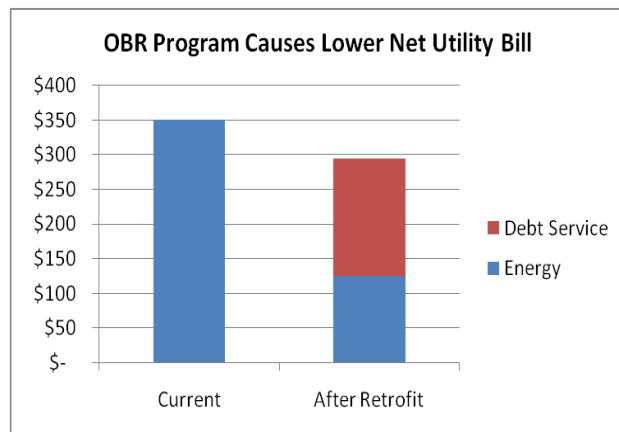
- Interest rate on loan: 6.25%
- 15 years repayment schedule
- Monthly payment: \$170

Utility bill after retrofit: \$125

Utility bill + loan payment: \$295

Savings: \$55 per month

Savings will grow as utility energy rates increase.



1.D. Existing On-Bill Financing Programs

On-bill finance programs use utility or ratepayer funds, while on-bill repayment programs use third-party capital. Most existing programs are on-bill finance programs.

Under a CPUC directive, the four investor-owned utilities in California have established on-bill finance programs for non-residential customers to invest in energy efficiency retrofits. Loans are offered at zero percent (0%) interest for up to five years. Commercial and industrial customers can borrow up to \$100,000; institutional customers can borrow up to \$1 million. The funds are repaid through the utility bill, and failure to repay the loan can result in utility service shut-off.

Credit losses on utility bills have historically been quite low and these programs have seen strong repayments, with default rates of less than one percent. Unfortunately, the existing programs are limited in size as both capital for loans and overhead are provided entirely by the utilities, without any leverage of private capital, and obtained from ratepayer contributions to energy efficiency programs. Since lending is not the utilities' core competency, overhead costs tend to be high. As this is a loan program, the repaid

funds go into a revolving loan pool. The four IOU programs total \$41.5 million in initially authorized lending capital for the 2010-2012 program cycle.⁹

While these programs have been generally popular, they will be difficult to scale as they rely exclusively on ratepayer funds. Nationally, there are at least 10 other on-bill finance programs that are currently operating successfully, but few of these programs offer more than \$10 million of financing per year.

Utilities in California have been wary of extending the on-bill financing program to residential customers due, in part, to federal and state consumer lending laws. Under the terms of this OBR proposal, the capital would come from third-parties which may limit the utilities' liability.

New York State recently passed legislation authorizing a state agency, the New York State Energy and Research Development Authority (“NYSERDA”), to establish an on-bill recovery program for residential, small business and multi-family properties. This program is expected to be the largest on-bill program executed to date. The loans will be initially underwritten by NYSERDA who will pay fees to the utilities to cover utility costs for providing billing services. Upon sale of the property the loan can either be prepaid or can stay with the meter. Nonpayment of the loan is expected to result in termination of utility service.

⁹ Baker, Simon. *On-Bill Financing at PG&E, SCE, SDG&E, SoCalGas*. Rep. California Public Utilities Commission, Sept. 2010. Web. <http://www.energy.ca.gov/ab758/documents/2010-09-28_workshop/presentations/09%20CPUC%20Baker%20%20on%20OBF.pdf>.

- IOU on-bill financing program size for 2010-2012:
- PG&E: \$18.5M
 - SCE: \$15M
 - SDG&E: \$5M
 - SoCalGas: \$3M

2. Benefits of On-Bill Repayment

2.A. Ratepayer Benefits

Expanded investment in EE, and lowering the costs of implementing EE programs, will save non-participating ratepayers in the form of lower electricity rates through avoided cost of additional generation and transmission.

Ratepayers that participate in the OBR program should be able to lower their total utility bill, since energy savings will, in most cases, be required to be greater than debt service.¹⁰ Additionally, energy efficiency upgrades tend to improve the comfort and aesthetics of a home and the net operating income and asset value of commercial properties.

2.B. Benefits to Homeowners and Renters

In the single-family arena, OBR offers the chance to transform the marketplace by offering many of California's 8.4 million homeowners the capital necessary to finance energy efficiency. Investments that achieve 25 percent energy use reduction are typically \$7,200 per home.¹¹ Given today's housing market, where 30 percent of homes are still under water and 50 percent of all home sales are distressed, it is unlikely that most homeowners have access to the capital necessary to reduce their home energy consumption by 25 to 40 percent. OBR offers a solution for providing that capital to homeowners.

In the multi-family/multi-tenant arena, OBR offers owners of master-metered buildings the chance to access currently scarce, standalone low-cost capital. OBR also helps tenants in individually metered buildings undertake improvements to specific units, while building owners also make improvements to common areas.

2.C. Social Benefits and Job Creation

CPUC estimates several benefits from existing energy efficiency programs. For the years 2010 thru 2012, these benefits include:

- Energy savings of almost 7,000 gigawatt hours, and 1,500 megawatts
- 150 million metric therms of natural gas
- Three million tons of greenhouse gas emissions avoided
- Between 15,000 and 18,000 skilled green jobs created¹²

¹⁰ In some instances, expected energy savings from the EE investment may not be realized. For these reasons, only projects with expected monthly savings that, on an annual average basis, exceed the loan payments *with an adequate margin for error* should be eligible for OBR.

¹¹ *Energy Efficiency Financing in California*. Rep. The California Public Utilities Commission. July 2011

¹² California Public Utility Commission. Energy. *CPUC Makes Largest Commitment Ever Made by a State to Energy Efficiency*, 24 Sept. 2009. <http://docs.cpuc.ca.gov/PUBLISHED/NEWS_RELEASE/107424.htm>.

Expanding access to low-cost EE financing should extend these benefits. As a first estimate, we can expect benefits from existing programs to scale linearly, so a tripling of investment (from approximately \$1 billion annually in the current planning cycle to \$3 billion annually) might produce a tripling of benefits. While this is probably true for skilled energy sector jobs, it is hard to determine without more inquiry about the environmental benefits, like greenhouse gas emissions avoided.

The job creation benefits of OBR are hard to estimate, but potentially substantial. One scholarly study indicates that employment in the energy efficiency sector could quadruple nationally, to nearly 400,000 jobs by 2020.¹³

2.D. Utility Benefits

Utilities will receive lenders fees in exchange for providing billing services. OBR will also help utilities meet EE program goals.

¹³ Goldman, Charles, Merrian Fuller, Elizabeth Stuart, Jane Peters, Marjorie McRae, Nathaniel Albers, Susan Lutzenhiser, and Mersiha Spahic. *Energy Efficiency Services Sector: Workforce Size and Expectations for Growth*. Rep. Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division, Sept. 2010. Web. <http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&ved=oCCoQFjAB&url=http%3A%2F%2Feesd.lbl.gov%2Ffea%2Fems%2Freports%2Flnl-3163e-ppt.pdf&ei=YBDpTtXTG8iggweotMjfCA&usg=AFQjCNHEXc_6vtg7k2fk8Zoe2zbiZ6lsqg&sig2=h_owdsYNjW7ZimwJO5tAMQ>.

3: Program Features and Alternatives

A well designed OBR program would have these key features:

- **Flexibility** – OBR can be designed to provide financing for commercial, public and residential buildings including multi-family rental buildings. Additionally, OBR will significantly improve the credit quality of a wide variety of financing mechanisms including loans, leases, Energy Services Agreements (“ESAs”) and Power Purchase Agreements (“PPAs”).
- **Sensible Qualification Methods for Measures and Projects** – Qualification methods must be designed to provide both strong consumer protection and support a variety of contractor business models.
- **Financing Obligation is Part of Rate Tariff** – Lenders will benefit from the utility using all standard collection procedures to improve repayment. This will lead to lower interest rates and better terms for borrowers.
- **Obligation Tied to Meter** – Loan repayment is a tariff that stays with the meter to enable upgrades with long payback periods without worrying about sale or change in tenant.
- **Strong Consumer Protection** – Projects must be designed to insure that energy savings exceed debt service and that a participating consumer’s utility bill declines after the project is complete. Additionally, inspection and qualification procedures must be created to prevent participation by unscrupulous contractors and lenders.

3.A. Program Flexibility

- Single-family, multi-family, commercial and industrial building owners will be eligible for participation, including leased buildings.
- Both selected single measure and whole-building interventions will be eligible for loans.
- Rules will be developed to allow for a range of financing vehicles, including loans and leases. For large commercial properties, ESAs and PPAs may also be eligible.

3.B. Eligible Efficiency and Renewable Generation Measures

Either utilities or state agencies will ensure that borrowers who accept loan repayment via utility bills have invested in reasonable measures at reasonable costs, and that projects have been properly designed and installed. This will likely entail:

- A list of approved energy efficiency and renewable generation measures
 - The list will initially be based off measures that currently receive rebates and are fixtures (i.e., not easily removed from the premises)
 - List will be continually updated to reflect new technologies and/or remove measures that prove to be ineffective or not cost effective
- Methodology guidance for contractors and inspectors to estimate energy savings for energy measures
 - Savings estimates will take into account historical usage patterns for the building and/or building type
 - Estimation methodologies will be conservative so that most customers will experience better than expected energy savings
 - Measures with highly variable performance may be excluded
 - Measures that are highly dependent on customer behavior may also be excluded

3.C. Project Qualification

- Contractor will provide customers:
 - Written estimate of average monthly energy and dollar savings for the project
 - Estimated project cost and monthly debt service payments
- Allowable debt service will be no more than estimated savings with an adequate margin of safety
- A sampling of completed projects will be inspected by neutral third-party inspector
- In addition to loans, leases may qualify (Note: Many residential PV solar installations are structured as leases for tax reasons)

The program will consider other project qualification processes, subject to the need to provide adequate consumer protection.

3.D. Obligation is a Rate Tariff on the Meter

- Loan payments will be listed as a separate line item on the monthly utility bill
 - Utility will process payments for lender in exchange for a fee
- Partial payments will be allocated pro rata between energy and loan obligations
- The utility will follow all standard collection policies and protocols as approved by the PUC
 - High collection rate for utility obligations will improve credit quality of obligation for lender

Rationale

- Since debt service must be less than energy savings, the customer's total bill will be less after the OBR transaction
 - Lower bills are easier to pay
- Unless the lender believes that the customer has a very strong incentive to repay the loan, the lender will view the obligation as unsecured consumer debt, similar to credit card debt. If that were the case:
 - Interest rate and other terms will reflect this risk, and be less attractive to consumers
 - Lenders see less benefit from using an OBR structure due to higher delinquencies on loans repaid via this mechanism and administrative costs

Alternatives

- Ratepayer or taxpayer money could be used to establish a loan-loss reserve

3.E. Obligation Stays with the Meter

- The obligation will be considered part of the rate tariff for the building.
- Upon change in ownership (or occupancy for rental properties), the new owner/tenant will be provided with the original estimate of savings from the project, as well as the terms of the remaining obligation. The debt obligation would be effectively assigned to the new buyer or tenant through the

mechanism of a continuing rate tariff. Similarly, a rate tariff covering on-bill-repayment continues for a new owner after foreclosure.

- Appropriate disclosure and consent documentation and procedures will be developed.
- The new owner or tenant will receive continued bill savings from the upgrade, and will pay associated remaining debt service.

Rationale

- It will increase the willingness of the owner/tenant to commit to energy improvements by eliminating the concern that the current occupant may not remain in the property long enough to personally recoup the investment.
 - Will allow for projects with longer paybacks than expected residency of current occupant.
- It will allow OBR to overcome “split incentives” to work for rental and multi-tenant properties, where the landlord is not interested in capital expenditure because the tenant pays the utility bill.
- This improves repayment expectation, and thus supports lower interest rate as utility bills are likely to be paid if the building is occupied.

3.F. Consumer Protections

- Program terms will require projects to provide energy savings in excess of debt service
- Loan maturity must be less than expected useful life of upgrade
- All loans will be fully pre-payable at any time by arrangement between the lender and utility
 - All loans will be subject to standard consumer lending protection laws applied to the loan originator (e.g. bank or leasing company)
- All lenders and contractors must meet defined eligibility criteria
 - Criteria to be developed by PUC and CEC
- Project inspection by expert, certified, neutral third-party will confirm proper installation and calculation of expected energy savings
 - Contractor will have the option of remedying installation and/or reducing project price of projects that do not meet forecasted energy savings so that debt service will be within program criteria

- PUC/CEC will maintain database of failed inspections and revoke program eligibility of contractor for repeated failed inspections
- Once the project has been installed, customers whose projects are underperforming may request a follow-up inspection
 - Underperformance due to contractor error will be remedied by contractor
 - Reserve funds may be created to compensate consumers for other causes of project underperformance

3.G. Utility Role and Compensation

- OBR will be integrated into the utilities' existing energy efficiency programs
 - Low cost financing should increase effectiveness of existing programs
 - Marketing efforts from contractors and/or lenders may also increase program uptake
- The utility is providing a valuable billing service for the lender
 - Utility will receive a monthly payment and/or origination fee from the lender
- Utility may also play a role in marketing, contractor qualification and inspection
- Utilities will collect and maintain a performance database of project outcomes
 - Data will be sufficiently aggregated to prevent release of confidential information
 - PUC will consider whether to also collect information about changes in occupancy to enhance the value of the database

Alternatives

- If interfacing with a large number of lenders becomes too burdensome for the utilities, a transaction processing company could provide a single interface for all utilities. Would allow each bank to also have a single point of interface
 - Transaction processing company would be paid for by the lenders
 - Utility costs would likely be reduced due to single interface and compensation could be lower

3.H. Considerations for Commercial and Industrial Buildings

- Commercial and industrial building owners and occupants will be eligible for participation under generally similar terms.
- The program can consider allowing alternative transaction types, including Energy Services Agreements and Power Purchase Agreements, in addition to loans and leases.

3.I. Considerations for Multi-Family Buildings

- Multi-family building owners and occupants with individual meters will be eligible for participation. Terms may differ for master metered and individually metered dwellings.
- Separately metered public spaces within multi-family dwellings, such as courtyards with lighting or pool pumps, are particularly well-suited for OBR.

3.J. Additional Issues to Consider

- Programmatic objective is to create an open, competitive marketplace that allows various business models to develop attractive solutions to meet a wide variety of customer needs
- Selective public subsidies may be used for low-income customers or other underserved markets
- Insurance products may be developed that guarantee project performance for a fee

4. Conclusion

An OBR program allows building owners to repay investments for eligible energy efficiency and renewable electricity generation projects through their monthly utility bills. The loans would be underwritten and financed by private, third-party capital. OBR can work for single-family, multi-family and commercial buildings, whether they are owner occupied or leased.

An OBR program can mobilize billions of dollars in private capital for energy efficiency investments in existing California buildings, thereby avoiding millions of tons of greenhouse gas emissions, while providing consumers net economic savings and reducing the need to invest in costly generation.

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