Section 5: Strategic Plan

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Section 5: Strategic Plan (RFP Section 4.4.3.5)

Executive Summary

Overview

Strategic planning is a key process for developing a robust and cost-effective clean energy portfolio for the State of New Jersey. A comprehensive strategic plan needs to incorporate a wide variety of stakeholder perspectives as well as overarching policy and regulatory objectives. Expert analyses of relevant market and energy use data provides a solid foundation on which to build an effective strategic plan with achievable goals and reasonable budgets. Each of these processes, if done well, takes time and focused effort. In the meantime, the state needs to address immediate program needs and capitalize on the current opportunities for maximizing savings from the existing clean energy portfolio. Thus, we propose a two-pronged approach as follows:

1. Develop a *preliminary* strategic plan that identifies opportunities to deliver additional energy savings and value at a lower cost; and
2. Lead a *comprehensive* strategic planning process to vet and refine the ideas presented in the preliminary plan after contract award.

Preliminary Strategic Plan

Our preliminary strategic plan is predicated on a set of key objectives which we believe are consistent with the direction the state would like the NJCEP to take. Those objectives are:

- **Getting more "bang for the buck".** The single most important objective of our preliminary plan is to increase the energy savings yield per program dollar spent.
- **Creating sustainable, in-state jobs**. We see this as one of the core goals of the state's historic and future energy policy.
- **Increasing the use of private capital.** This can be accomplished by both educating consumers so they are more willing to spend their own money and by promoting and facilitating greater use of private financing mechanisms.
- **Accessing non-SBC funding sources.** This will have the obvious benefit of reducing the level of funding required to manage the programs or getting more out of SBC funds.
- **Addressing equity and portfolio sustainability concerns.** While increasing savings per dollar spent is a critically important objective, it needs to be balanced by efforts to ensure all customer groups have the opportunity to benefit from Clean Energy programs as well as by efforts to build market momentum for the next generation of energy efficiency and renewable energy technologies.
- **Maximizing the speed of change while minimizing short-term disruption to Clean Energy markets.** This requires careful prioritization and staging of program changes.
- **Focusing on lifetime savings (rather than first year savings).** This is necessary to both truly assess the value of programs and achieve longer-term policy objectives.

Our preliminary plan assumes that the FY16 funding level recently approved by the BPU ($213.7 million in new funds for NJCEP, with $176.7 million allocated to efficiency programs and $30 million of that allocated to the low income program) will be in place for each of the next four years (FY16 - FY19). We further assume that our proposed program changes can begin to go into effect on January 1, 2016. We acknowledge that may be an ambitious assumption, but thought it better to suggest an aggressive schedule which can be pushed back as appropriate.

Within that framework, we propose dozens of modifications to the existing portfolio of programs, some of which are quite substantial or fundamental. Most are consistent with one of eight key thematic directions that underpin our approach:

- **Intentionality to the selection/inclusion of programs.** We assume there are no "sacred cows". The NJCEP portfolio should only include programs that – in an ideal combination with others – are necessary to serve specific strategic objectives such as maximizing savings per dollar, promoting long-term market transformation, or enabling treatment of hard-to-reach customers.

- **Program consolidation and/or integration.** We believe this will both reduce program overhead costs and make it easier for customers to participate through increased flexibility and reduced transaction costs. For example, we propose combining the Residential Home Performance and HVAC programs into a single program. We also propose to merge the Pay for Performance, Large Energy Users, and Combined Heat and Power and Fuel Cells programs, as well as the biomass and storage components of the REIP program into a single "Customer-Tailored C&I Program" that has the flexibility to address a variety of different clean energy opportunities and different (often unique) needs of medium to larger customers.

- **Account management.** Emphasis on account management is a common thread to the most effective efficiency program portfolios across the country. It is an essential element to the proposed new "Customer-Tailored" program for larger business customers.

- **Comprehensiveness and depth of savings.** Once a customer is successfully engaged, it is important that the NJCEP programs either persuade the customer to invest in as much clean energy as is cost-effective (so that customer acquisition costs don't need to be re-incurred in the future) or develop a relationship that enables on-going engagement (especially for larger customers). This can be accomplished, in part, by ensuring all program incentive structures promote greater comprehensiveness.

- **System approaches.** This is a corollary to the emphasis on comprehensiveness. Some existing NJCEP programs (e.g. Home Performance and Pay for Performance) already do it well. However, the concept could and should be expanded. For example, rebates for commercial lighting measures could be replaced or augmented by incentives for reductions in lighting power density which we envision being promoted through the new "Customer-Tailored C&I Program".

- **Upstream Incentives.** Such incentives reduce program administration costs because fewer rebate checks need to be cut. They also typically enable reductions in rebate levels (because incremental costs at the distributor level are lower than at the customer level) as well as higher participation rates. The current NJCEP Residential Lighting program is a good example of successful deployment of this strategy. However, we believe it can be effectively brought to the HVAC equipment market and possibly other markets as well.

- **Emerging Technologies.** Some investment in the promotion of emerging technologies, even if they are comparatively expensive in the short-term, can pay off handsomely in the long-run by building a "pipeline" of new savings opportunities that can replace others (e.g. residential lighting) that disappear due to the transformation of markets.

- **Financing.** We believe that the NJCEP programs can make better use of financing as a tool to address some market barriers to investments in clean energy. We devote an entire chapter of our preliminary plan to exploring how to design and manage efficiency programs – including through standardization of data collection procedures as suggested by the Investor Confidence Project – to support greater reliance on financing and private capital investments.

We also identify several program areas that would be best-suited for a pilot program. For example, new financing strategies for efficiency or renewable projects can be tested effectively within a pilot program construct. This industry-tested approach mitigates the risk associated with full-scale implementation of innovative approaches before they are sufficiently vetted in the market. Lessons learned from the evaluation of these pilot programs will then be used to inform future program designs.

In the end, we estimate that by the fourth year of the strategic plan our proposed portfolio and program changes would collectively produce ***66% greater electricity savings and 57% greater fossil fuel (gas, oil and propane) savings*** than were achieved by the NJCEP portfolio in 2014, assuming the same level of spending.

Our preliminary strategic plan closes with a discussion of alternative sources of funding or co-funding that could contribute to achieving the goal of reducing reliance on SBC funds. We identify three potential sources – PJM capacity market payments, U.S. EPA Clean Power Plan compliance options, and using efficiency and distributed generation as (utility-funded) T&D resources. Our plan discusses policy and implementation issues that would need to be addressed in order to access each source.

Process for Comprehensive, Longer-Term Strategic Plan

The second prong of our proposed strategic plan development process calls for revising, or refining, the preliminary strategic plan included in this section of our proposal during FY16. This

process aligns with the following five steps initially discussed during the NJCEP Leadership Team kick-off meeting in November 2014:[1]

1. Setting high level objectives
2. Establishing clear policy guidance related to those objectives
3. Conducting market research
4. Establishing specific goals informed by those studies
5. Planning programs to achieve those goals

In this document, we walk through the details of our proposed preliminary strategic plan and describe the process for the development of a comprehensive statewide strategic plan for the NJCEP portfolio in FY16. The result would be a long-term plan, built from the bottom up, that includes proposed funding levels and associated savings that could be used as the basis for the Board's consideration of a multi-year CRA. ***We have included the cost of helping the state develop a long-term strategic plan in our proposal pricing.***

AEG Team Qualifications for Strategic Planning

The AEG team has a unique combination of qualifications for addressing this task. To begin with, we are very familiar with New Jersey's efficiency and renewable energy markets and intimately familiar with the programs the state has been implementing to influence those markets since the early 1980's. This grounding in "local knowledge" is essential to crafting a strategic plan.

Our team also brings vast experience with and expertise in clean energy policy and programs from other jurisdictions. As shown in the table on the following page, members of our team are currently working in or have worked in every single one of the top 20 states ranked in ACEEE's 2014 State Energy Efficiency Scorecard, as well as in leading jurisdictions in Canada, Europe and elsewhere. In virtually all of those jurisdictions, our team members have been extensively involved in strategic planning for efficiency and/or renewable energy program planning. That experience gives us invaluable, first-hand knowledge of the pros and cons of new approaches that might be considered for New Jersey.

[1] The sixth and last step discussed at the meeting was "implementing programs" which we treat here as a "post-planning" step (i.e. following through on the strategic plan) rather than a step in the planning process.

AEG Team Experience in Leading State Efficiency Programs
(based on rankings from ACEEE's 2014 State Energy Efficiency Scorecard)

Rank	State	AEG	EFG	CR/CSG	ICF	TRC
1	MA	X	X	X	X	X
2	CA	X	X	X	X	X
3	OR	X		X	X	X
3	RI		X	X	X	
3	VT		X			
6	CT	X	X	X	X	X
7	NY	X	X	X	X	X
8	WA	X		X	X	X
9	MD	X	X		X	
10	MN	X	X	X		
11	IL	X	X	X		
12	MI	X	X	X	X	X
13	CO	X	X	X		
14	IA	X	X	X		
15	AZ			X		
16	ME		X	X		X
17	HI	X				
17	WI		X	X		X
19	NJ	X	X	X		X
20	PA	X	X	X	X	X

While our program planning efforts will be led by AEG and EFG, each of the program implementation contractors on our team also bring extensive program planning experience to the table. AEG and EFG will work closely with each of our partners to ensure that "best in class" ideas from around the country are brought to the table in New Jersey for consideration.

5.1 Preliminary Strategic Plan

5.1.1 Foundational Assumptions

In the comprehensive strategic planning process that we propose below, there will be sufficient time, interaction with the BPU and other stakeholders, and information to enable the BPU to fully consider a range of potential approaches to the development of the State's future Clean Energy Program portfolio. However, for our proposed preliminary plan, we made some key assumptions regarding key policy objectives, budget levels, and timelines for changes based on a review of the State's Energy Master Plan, BPU Staff's CRA Straw Proposals, and relevant BPU Orders. Each of these assumptions is discussed below.

Key Objectives of the Preliminary Plan

Our team's understanding of the New Jersey clean energy sector and our collaborative work with the state over several years provided the foundation for the following key objectives of our proposed preliminary plan.

1. **Get more "bang for the buck".** On a portfolio basis, New Jersey is currently spending more per unit of efficiency savings than many leading jurisdictions. This is particularly true for electricity savings. The recent ERS benchmarking study found that the median performance among the NJCEP programs that it analyzed was the 32nd percentile (meaning in the bottom one-third of programs across the country) in terms of program spending kWh saved.[2]

   The single most important objective of our preliminary strategic plan is to increase the energy savings yield per program dollar spent. That can be accomplished in a variety of ways including shifting some resources from programs with lower yields to programs with greater yields, greater leveraging of private capital (e.g. through increased use of financing), strategic adjustments to some financial incentive levels, more effective outreach and/or marketing (e.g. targeting customers with the greatest savings potential), reducing administrative costs (e.g. through program consolidation), more quickly adapting to market feedback (e.g. by leveraging data from smart meters and thermostats and/or periodic market research), etc.

2. **Focus on lifetime energy savings (rather than first year savings).** Most state efficiency resource standards and most benchmarking studies – including the ACEEE state efficiency scorecard –focus on how much annual or 1st year savings are being achieved. We believe this approach has two fundamental flaws. First, it treats savings from efficiency measures that last one, three, or five years the same as savings from a measure that lasts 10, 20, or even 30 years. This treatment distorts any comparisons of performance and provides a misleading picture of the actual "bang for the buck". Second, it undermines key state policy objectives that are typically focused on longer-term transformation of energy use and comparing energy efficiency to alternatives such as traditional or distributed generation. Therefore, we emphasize lifetime savings per dollar spent in our preliminary plan.

3. **Address equity and portfolio sustainability concerns.** While we whole-heartedly endorse the need to increase savings per dollar, we recognize that this should not be the only objective. Otherwise, efficiency portfolios would primarily target only selected customer groups (e.g. large commercial and industrial customers from which substantial savings can often be acquired least expensively) and/or simple, inexpensive efficiency

[2] See: Energy and Resource Solutions, *Review and Benchmarking of New Jersey's Clean Energy Program*, prepared for the New Jersey Board of Public Utilities, February 24, 2015. Note that though this benchmarking effort focused on spending per first year kWh saved, rather than the more appropriate metric of spending per lifetime kWh saved (see our second objective), our understanding of the mix of efficiency measures promoted both in New Jersey and in other jurisdictions leads us to believe that the results of benchmarking per lifetime kWh saved would not be dramatically different.

measures (e.g. residential and commercial lighting products). That would mean that many customers who pay into efficiency funds would not have the opportunity to benefit. Also, when you focus on realizing only the easiest savings, an infrastructure or market momentum for obtaining additional savings in later years is not developed. This can lead to a potential boom-and-bust cycle of efficiency funding and savings, and is a far less effective approach for meeting medium and longer-term policy objectives.

While our preliminary strategic plan focuses heavily on increasing savings yield per dollar spent, it also recommends programs that address customer market segments that are historically hard-to-reach (and typically more expensive) as well as programs that address savings opportunities that are more challenging to address (e.g. home retrofits). In addition, it embraces the notion that some effort should be made now to begin promoting emerging technologies whose savings may be more expensive to acquire in the short term but may be less expensive in later years if the program infrastructure to acquire them is built now.

4. **Increase the use of private capital for clean energy investments.** One way to achieve more savings per program dollar is to improve the way existing programs leverage private sector capital for efficiency investments. Two key ways to achieve this include (1) helping consumers become better informed of the benefits of investing in clean energy – through targeted and tailored marketing, outreach and other means – so they are more willing to invest their own money in projects and (2) promote and facilitate greater use of financing by consumers. Our plan addresses several ways to improve consumer outreach. We also identify the full range of financing options and applications to existing and proposed future efficiency and renewable energy programs.

5. **Maximize the speed of change without too much disruption in the effectiveness of NJCEP.** We are proposing several powerful changes to the existing portfolio of efficiency and renewable energy programs. However, it is important to recognize that significant change for long-term goals often has a short-term cost. For example, announcements of forthcoming reductions in rebate levels for a program can lead to short-term spikes in demand for program services as customers and contractors try to take advantage of the current rebate levels before they change. This demand spike is then often followed by a period of very low demand as contractors focus on completing projects at the expired rebate levels, contractors adapt to the lower rebate levels, and as marketing efforts to counter-balance the effect of the new, lower incentives take time to become effective. Our preliminary strategic plan includes an emphasis on increasing savings from programs we expect to be relatively stable in the short-term to counter-balance the almost certain short-term savings decline from the programs for which we propose more immediate and substantial changes.

6. **Access other, non-SBC funding sources.** New Jersey has the ability to reduce reliance on or maximize the effect of SBC funding program by leveraging non-SBC funds to support the objectives of NJCEP program portfolio. Our team has identified three

potential sources of non-SBC funds: (1) PJM capacity market payments; (2) federal Clean Energy Plan (111d) carbon dioxide emission reduction compliance mechanisms; and (3) utility funding to cost-effectively defer transmission and/or distribution (T&D) system investments through geographic-targeting of NJCEP programs. Capitalizing on each of these opportunities will require non-trivial policy and program changes but we believe this effort would benefit New Jersey significantly.

7. **Creating sustainable, in-state jobs.** The success of the current, and future NJCEP portfolio is founded on the contributions from local contractor networks, vendors, installers, retailers, lenders, in-state educational institutions and many others. The more successful the NJCEP programs are the more these local businesses grow and invest in hiring additional locally-based personnel. Strategic consideration is given in our preliminary plan to support the continued long-term economic benefits to New Jersey businesses and institutions that results from NJCEP portfolio implementation.

Funding Levels

In the comprehensive strategic planning process that we propose to launch after contract award, the process for arriving at proposed NJCEP funding levels by year will be an iterative one in which we help the BPU explore trade-offs between savings levels, other policy objectives (customer equity, addressing low income needs, clean energy jobs development in the state, etc.) and spending levels to find an appropriate "sweet spot". However, since any effective planning process of this size and scope will need active involvement of the BPU and key stakeholders, a detailed final plan is not possible to present in an initial or straw proposal. Instead, for the purpose of developing energy savings goals, we assume that funding levels will be fixed and constant for every year from FY16 through FY19 while recognizing that this may not, in fact, be the case. This proposal is directional and illustrative of the potential changes that could be made through a more comprehensive strategic planning process.

To develop our preliminary plan we utilized the FY16 funding level recently approved by the BPU which is $213.7 million for NJCEP, with $176.7 million allocated to energy efficiency programs of which $30.0 million is dedicated to low income (leaving $146.7 million annually for non-low income energy efficiency programs).[3] The approved FY16 funding also includes $11 million for renewable energy programs and $14.8 million for CHP-Fuel Cell projects.

Our preliminary plan shows increasing savings over time within this fixed budget, addressing the RFP's stated interest in leveraging more private capital and spending less money per unit of savings. Of course, if additional funding were to become available, the savings could be increased even more. We suggest that the comprehensive strategic planning process that we outline below (and propose be launched upon contract award) be used to arrive at an informed conclusion on future spending levels. We interpret the fact that the BPU Staff's Straw Proposal only covers FY16 to suggest that is consistent with what the BPU has in mind.

[3] We assume that additional funds allocated to address prior year commitments will also remain stable from year to year.

We emphasize that although we developed our plan assuming a fixed SBC funding level, it does not mean we are assuming that the available funding would be fixed at current levels. As discussed further below, there is potential for a significant portion of future portfolio funding to come from three other sources:

- PJM capacity market payments;
- Investments to comply with the U.S. Environmental Protection Agency's Clean Power Plan; and
- Utility funding of geographically-targeted efficiency and distributed generation to defer expensive capital investments in transmission and/or distribution system infrastructure.

To the extent that those funding sources are accessed, a fixed NJCEP funding level will require fewer SBC funds. Alternatively, fixed levels of SBC funds could be supplemented with significant additional funds to acquire far greater levels of savings.

Timeline for Change

Our preliminary strategic plan – particularly the savings targets and budget levels for each program – is based on the presumption that our proposed program and portfolio changes can begin to go into effect on January 1, 2016 (i.e. half way through FY16). We acknowledge that this may be an ambitious assumption given that our proposed strategic plan is only preliminary, that there would need to be a process for informally vetting, refining and/or fundamentally modifying the concepts embodied in it with OCE Staff, for obtaining stakeholder input and for more formal consideration by the BPU. Further, that process would have to overlap with the very important process of transitioning the existing programs from the existing Market Managers to our new team. However, we thought it better to suggest an aggressive schedule for initiating program improvements which can be pushed back as appropriate. If the schedule for program modifications is pushed back, our proposed increases in savings and other benefits would be deferred as well. However, we thought it better to suggest a specific schedule for initiating program improvements in order to provide clear illustration of their potential impact.

5.1.2 Proposed NJCEP Program Portfolio

We believe a number of changes to the existing mix of efficiency and renewable energy programs, as well as the redesigns of individual programs, are needed. Based on our conclusions regarding portfolio level objectives (articulated above), our understanding of the existing programs and the New Jersey markets they are designed to serve, and our extensive experience working across the country and related expertise in what is state-of-the-art in the energy efficiency and renewable energy industries, we have developed a number of specific suggestions for change, many of which cut across multiple programs. Others are unique to specific programs. We present those changes and their impacts in this section of the plan.

Specifically we provide:

- An overview of common themes to our proposed plan;
- An overview of our proposed approach to addressing each sector;

- A more detailed discussion of each of our proposed programs;
- A forecast of sector level new funding levels and savings targets;
- A detailed discussion of financing strategies and how we anticipate expanding the use of financing in each program area; and
- A discussion of alternative funding sources that could potentially be tapped to supplant and/or augment SBC funding for the programs.

Key Portfolio Themes

We have identified a number of high-level thematic directions in which we believe the NJCEP program portfolio should evolve. They are as follows:

- **Intentionality to the selection/inclusion of programs.** The NJCEP portfolio should only include programs that serve specific strategic needs such as generating savings at relatively low cost, promoting long-term market transformation of energy use, enabling hard-to-reach customers to participate and addressing other key objectives. Every existing program – and potential alternatives to each program – needs to be judged through those filters. Moreover, the portfolio of programs need to complement each other as a whole. Only the programs that most effectively meet portfolio objectives – in concert with each other and within the available budget – should be pursued.

- **Program consolidation and/or integration**. The current NJCEP portfolio has over 15 programs, some of which are very narrowly targeted to specific market segments and others which overlap in terms of the efficiency opportunities and the trade ally engagement. Program overlap increases administrative burdens while increasing transaction and participant costs. AEG is committed to exploring every possible opportunity to better integrate the offerings of the existing NJCEP portfolio. For example, we are proposing that the existing Home Performance with ENERGY STAR and Residential HVAC programs be merged. In the C&I sector, we believe the Pay for Performance, Large Energy Users, and Combined Heat & Power and Fuel Cell programs, as well as the biomass and storage components of the REIP program, should all be merged into a single Customer-Tailored C&I program that retains flexibility to address a variety of different efficiency opportunities and different needs among medium and larger customers.

  We also recommend launching a new cross-sector multifamily program with a single program manager who will oversee outreach and deploy technical resources to meet individual needs of all existing building owners – whether they are high rise buildings with central heating systems that require expertise that is more akin to commercial buildings, smaller three-story buildings with individual heating systems that require expertise more akin to residential buildings, or a combination of the two.

- **Account management**. As demonstrated in numerous jurisdictions, account management is a critically important element of high functioning efficiency programs. It is essential for larger commercial and industrial customers, as well as regional and national chains.

Account management enables us to much better understand customers' capital investment cycles and plans, their internal decision-making process, the key drivers of their success and other aspects of their business in order to know how efficiency measures can best help them and how they can most effectively be sold internally.

Account management is also important for the promotion of mass market efficiency measures to both residential and business customers – where it is essential that dedicated staff develop relationships with builders, design professionals, contractors, vendors, retailers, etc. to engage them in selling the program offerings. To be sure, the NJCEP programs currently rely on account management, at least to some degree, in all their programs. However, we believe this approach should be significantly expanded, particularly in the C&I sector. A full commitment to an account management model will be key to the success of our proposed new C&I Customer-Tailored program, both driving greater participation from medium and larger businesses and promoting more comprehensive treatment of efficiency opportunities (rather than relying so heavily on "one-off" prescriptive rebate applications – e.g. through the current C&I Retrofit program – for savings). Additional discussion regarding our approach to account management is included in the Outreach section of our Technical Proposal.

- **Comprehensiveness and depth of savings**. Achieving as deep savings as possible with individual customers who participate in NJCEP offerings is critically important. At least for smaller customers, once a customer participates it is often difficult to incur the acquisition and transaction costs of working with that customer again. That can be true for larger customers as well if the kind of business relationship discussed above under "account management" is not employed. One way to achieve deep savings is to offer multiple efficiency tiers with financial or other incentives increasing as savings increase. Several existing NJCEP programs do this. We are proposing that all program incentive levels (and other features) are structured to encourage the most comprehensive treatment of cost-effective efficiency opportunities.

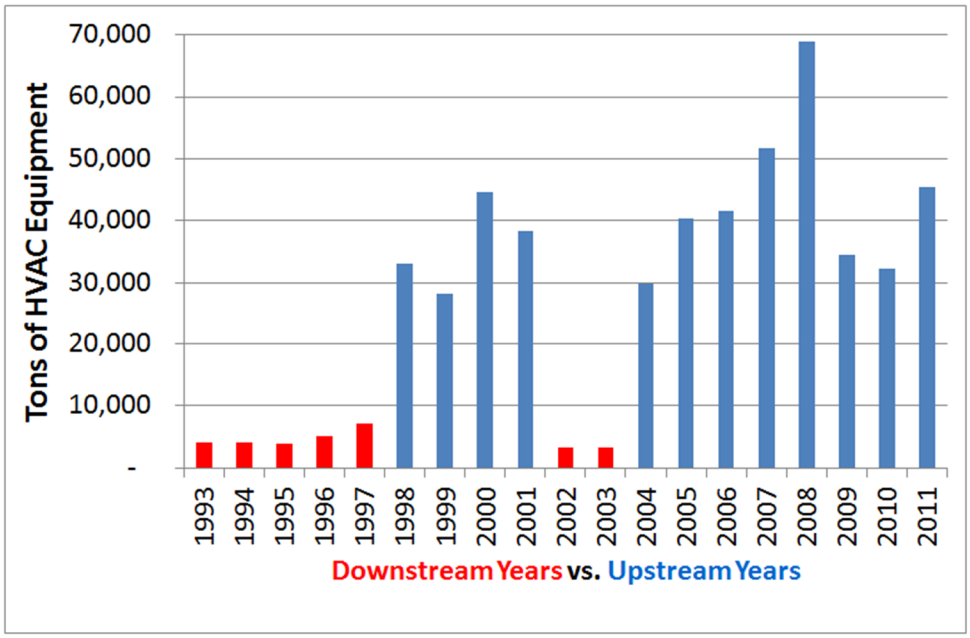
- **System approaches**. This is a corollary to the emphasis on comprehensiveness. Leading jurisdictions are shifting emphasis from measure-specific programs and incentives to programs that focus on whole systems and/or whole buildings. Some programs in the NJCEP portfolio already do this. Good examples include the Home Performance with ENERGY STAR and the Pay for Performance programs. However, there is still further room for enhancing this concept. For example, rebates for commercial lighting measures (in at least larger buildings) could be replaced with or augmented by incentives for reductions in lighting power density (i.e. watts per square foot). That approach will be promoted through our new consolidated Customer-Tailored C&I program.

- **"Upstream" incentives**. As in many other states, most New Jersey efficiency programs provide financial incentives to the customers ultimately purchasing the efficient products. There are a variety of potential advantages to moving the focus of programs "upstream" – that is, to provide financial incentives to contractors/vendors/retailers, distributors and/or

manufacturers of efficient products. Such upstream incentives reduce program transaction costs because far fewer incentive checks need to be cut. They often enable programs to lower incentives because incremental costs are increasingly smaller, in absolute terms, the farther up the supply chain you go (i.e. the incremental cost to consumers incorporates price mark-ups from each step in the supply chain). Finally, they put the onus on marketing the efficient product on the entities that best understand the market.

As the graphic below of a California switch to and from downstream and upstream HVAC incentives shows, this approach can not only lower costs per unit of savings, but also result in much greater participation and savings.

Figure 1: Changes in California C&I HVAC Program Participation with Upstream Incentives[4]



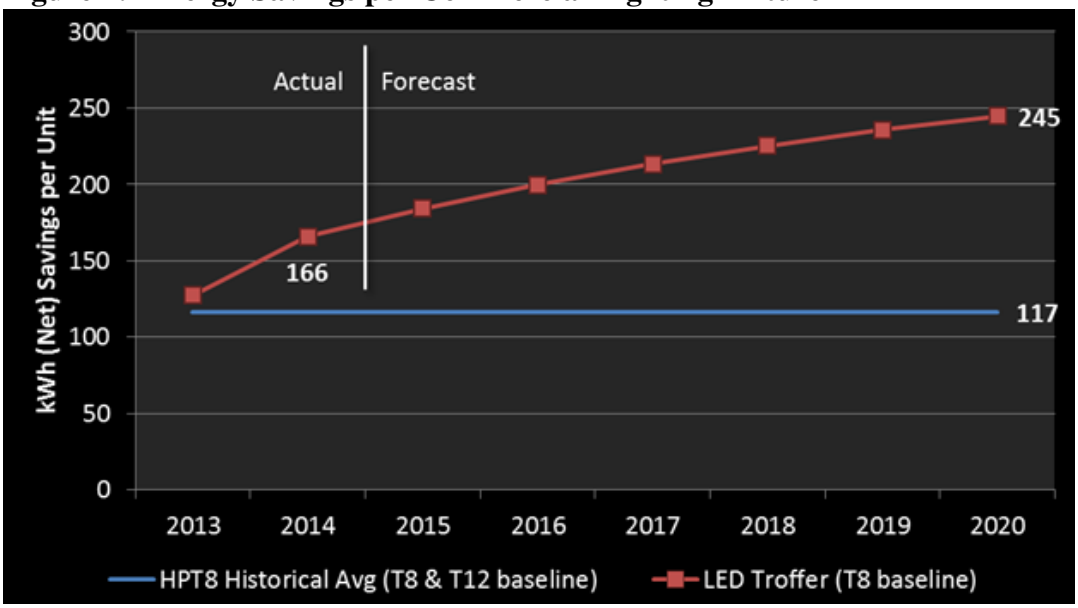
The NJCEP's residential lighting initiative uses this upstream approach. This model should be tested for potential application to residential and small business HVAC equipment and C&I lighting products.

- **Emerging technologies**. Related to the point above, leading jurisdictions do a very good job of identifying the next generation of efficiency technology, seeding the market for that technology and then – as costs decline – aggressively promoting it. A great example would be LED lighting technology for commercial buildings, with particular emphasis on LED troffer alternatives to linear fluorescent fixtures. As the following graphic illustrates, savings from LED troffers are already more than 40% higher than savings from high performance T8 fluorescent fixtures, and are forecast to grow even greater as

[4] Phil Mosenthal (Optimal Energy), *"Upstream Approaches to Commercial and Industrial Lighting Programs…and Other Potential Markets"*, presentation to the Illinois Stakeholder Advisory Group, March 19, 2013.

the technology evolves – to more than twice the savings from high performance T8s over the next several years (even with a higher assumed baseline efficiency). Costs for LED troffers have also come down dramatically in recent years, to the point where they are competitive (per unit of savings) with efficient fluorescent technology. There are still some challenges to be overcome with this technology. However, leading jurisdictions have begun to plan on it becoming one of the largest sources of C&I savings in the coming years. We believe New Jersey should begin to position itself now to do the same.

Figure 2: Energy Savings per Commercial Lighting Fixture[5]



With the need to phase out upstream residential lighting incentives before 2020 standards go into effect, it will also be important to develop other sources of residential electric savings. That might include promotion of emerging residential technologies such as "smart"/WI-FI thermostats, the latest heat pump dryers (for which NJCEP was instrumental in helping to develop the U.S. market), heat pump water heaters, and super-efficient cold climate heat pumps (for heating and cooling). Our preliminary plan includes budget for significant ramp up of promotion of at least a couple of these new technologies over the next four years.

- **Financing.** As noted throughout this plan, we believe that the NJCEP programs can make better use of financing as a tool to address some market barriers to investments in efficiency and renewable energy and to thereby increase the use of private capital in clean energy investments in the state. An extensive discussion of financing and our proposed approach to better leveraging financing products and strategies is provided in a section below.

[5] Estimates and graph are from Dan Mellinger, Efficiency Vermont Lighting Strategy Manager.

These themes are all reflected in the preliminary suggestions for modifications to the NJCEP program portfolio and our forecasts of increasing savings and lower spending per unit of savings outlined in the sub-sections below.

There would be great value – in the form of greater savings per dollar spent and greater customer satisfaction – making much more extensive use of analysis of customer energy usage records (i.e. utility billing data). For example, experience in Vermont – where Efficiency Vermont has access to and maintains a database of customer data – suggests such access enables more effective call center responses to customer inquiries (by trained operators pulling the customer's data on their screen and reviewing it during a call), more effective target marketing of different programs (achieving greater savings per project for high use customers), and better ability to develop partnerships with and achieve savings from larger customers (e.g. by identifying usage patterns that suggest weekend shut-down procedures are not effective).

Moreover, there are new innovations in the market that could help efficiency programs both cut costs and increase savings by enabling detailed assessments of efficiency potential – particularly behavioral/operational savings, but also savings from capital improvements – without ever entering the building, provided that customer usage data is available for analysis. There are certainly customer privacy and confidentiality issues that would have to be addressed. However, the Vermont experience – with not one single customer complaint in more than 15 years – suggests they can be managed. However, because this is a controversial topic that would require explicit change in policy, we have not assumed in our analysis that such universal access was available.

Residential Sector Programs

A number of adjustments can be made to the portfolio of residential programs in order to help them perform at a higher level than has been achieved in the past:

- **Merging the Residential HVAC Incentives and Home Performance with ENERGY STAR programs into a single Residential Home Retrofit program**. This will have several benefits including reduced program administration costs and greater consistency in messaging to the market (particularly consumers and HVAC contractors) about how to improve residential heating and cooling efficiency.

- **Moving more incentives upstream to the product distributors/manufacturers**. Initially, this would begin with furnaces and central air conditioners. In addition, we envision exploring the application of the concept to select appliances as well. We see this as a way to both lower incentive levels and increase program participation, while lowering program administrative costs.

- **Reducing incentives levels**. Most important will be a substantial reduction – on the order of a 50% reduction relative to FY15 levels[6] – for home retrofit services. However, we

[6] The 50% reduction would come from both a combination of (1) reductions in rebate levels; (2) reductions in the level of subsidies (interest rate buy-downs) for financing offers, at least for projects that are not fully comprehensive

expect to be able to reduce furnace and central air conditioner incentives by moving upstream. We believe that the evolution of the residential lighting market will enable some reductions in the current upstream incentive levels while growing participation levels (see next point).

- **A short-term increase in the promotion of efficient lighting products, followed by an intentional phase down and out of the lighting market.** The initial increase will be designed, in part, to counter-balance expected short-term reductions in savings from home retrofits as financial incentives for those services are reduced. However, that increase will need to be short-lived (i.e. a couple of years) as the state will need to begin phasing out promoting residential lighting efficiency in anticipation of the arrival of the 2020 federal lighting standards which will complete the transformation of the residential lighting market.

- **Increase emphasis on new emerging technologies**. Examples include heat pump dryers, super-efficient ductless heat pumps and heat pump water heaters. The development of these and other emerging technologies, such as WI-FI thermostats and home automation devices, will be critical to positioning the state to continue to generate electricity savings after the residential lighting "savings cliff" is reached.

- **Increase emphasis on financing**. The existing Home Performance with ENERGY STAR program already offers customers attractive financing. However, those offers are paired with very large incentives. We envision financing playing a bigger role as incentive levels are reduced. We plan to facilitate more universal consumer access to market-rate financing in the HVAC market, as experience in other jurisdictions suggests that is the residential market in which efficiency financing can gain traction most quickly.

- **Support home energy rating efforts.** We will work with the appraiser community to incorporate value of EE into appraised home value and explore establishing appraiser training and certification. We will work with the realtor community to incorporate EE labeling into multiple listing service (MLS) and with the Housing Mortgage Finance Agency to integrate EE components into affordable financing options.

Table 1 on the following page summarizes the proposed portfolio of residential programs and the impacts of our proposed changes for the programs on their financial incentive levels, total budgets, participation levels and savings. Each program is described in more detail.

in their treatment of efficiency; and (3) requiring customers to choose either a rebate or subsidized financing (rather than being able to take both). It would be a greater reduction than the reduction recently approved by the BPU for the FY16 program.

Table 1: Residential Summary Table

Program	Direction of Incentive Levels	Direction of Total Budget	Direction of Participation	Direction of Total Savings
Products **1. Appliances** **2. Lighting** **3. Plug Loads**	1. Steady for existing products, but growing slightly in aggregate as new emerging tech added (e.g. HP dryers) 2. Declining 3. Steady for existing products; increasing as new technologies and incentive program models added	1. Growing modestly as new emerging techs added, then more substantially 2. Steady or growing slightly 3. Growing slightly *Net impact is slight increase for FY16-17, leveling off FY18, then declining as lighting emphasis reduced*	1. Growing modestly initially, then more substantially 2. Increasing significantly 3. Increasing moderately	1. Growing modestly initially, then more substantially 2. Increasing significantly initially, then leveling off and declining 3. Modest grown in the outer years as new technologies are added *Net impact is significant increase for FY16-17, leveling off FY18, then declining as lighting emphasis reduced*
Home Retrofit **1. Whole Building** **2. HVAC Equipment**	1. Down 50% + in some instances per project 2. Down modestly starting FY17 as upstream approach put in place	1. Increase in FY16 incentive costs, then large drop in FY17, steady growth FY18-19 2. Growing slightly FY17 *Net impact is lower admin costs moving forward and steady or even increase in incentive costs for FY16, drop in FY17, gradual growth in FY18 and beyond, but not back to current levels*	1. Increase in FY16, large drop in FY17, but back to current levels by FY18 and growing in FY19 due to integration with HVAC Program 2. Steady increase	1. Increase in FY16, drop in FY17, but then returning to current and growing levels by FY19 2. Slight increase in FY17, then a decrease due to integration with the Home Retrofit Program *Net impact is modest increase in FY16, holding steady in FY17 (growth in HVAC offsets retrofit decline), steady growth thereafter*
New Construction	Steady	Decrease in FY17 due to IECC2015 Code adoption, steady increase FY18-19	Decrease in FY17 due to IECC2015 Code adoption , steady increase FY18-19	Decrease in FY17 due lower participation, steady increase FY18-19

Residential Products Program

The Residential Products Program will have the most dramatic short-term impacts as a result of shifting federal standards. The shifting standards have an impact specifically on the lighting program offerings. For appliances, we can expect program participation to grow modestly in the short term, then to increase more substantially as emerging technologies gain a stronger marketplace foothold. Emerging technologies stand to have the largest impact on the residential appliances program offerings with the emergence of heat pump clothes dryers, "smart" appliances, set top boxes, etc. We propose to explore the option to shift more incentives upstream to distributors/manufacturers for appliances. This could reduce administrative costs, increase the distribution of efficient products, increase cost-effectiveness, and increase overall program savings yields.

Lighting offerings will see a fairly dramatic swing during this program cycle. Federal lighting standards that go into effect in 2020 will effectively mandate the use of products that are equivalent in efficiency to CFLs. Thus, we propose a short-term increase in current program offerings and a stronger shift to LEDs to take advantage of the existing lighting market conditions before the impacts of lighting standards are fully realized and while savings from other residential program offerings build. CFL participation will be eventually phased out of the program. In conjunction with the phasing out of CFLs, LED lighting will play a larger role in the program over the course of the program cycle. LED participation can be expected to steadily increase, but incentives should be able to be reduced over time due to the evolving lighting market and continued reduction of LED costs over time. In FY19 and beyond residential lighting may be completely phased out do to an additional shift in lighting standards baselines in 2020. The shifts in lighting types and incentives should have an approximately net neutral impact on program budgets, savings, and cost-effectiveness. Participation of appliance measures such as set top boxes, smart power strips, appliance recycling, and plug load measures will remain steady in the near term, but have the potential to increase with the emergence of new emerging technologies.

Residential Home Retrofit

The proposed Residential Home Retrofit Program would combine the Home Performance with ENERGY STAR (HPwES) with the Residential HVAC program (*COOL*Advantage and *WARM*Advantage). Within this new program, customers will have a tiered approach they can pursue: Whole Building or HVAC equipment. The Whole Building track will be for customers who are interested in pursuing a comprehensive retrofit or have gone through the HVAC program and are interested in completing a deeper retrofit of the entire home including building envelope. This track will also target customers making major renovations to their homes. The HVAC equipment track is intended for customers who are changing single pieces of equipment. The HVAC track will provide customers with a prescriptive list of eligible measures they can choose to install in their home. These tracks will allow customers to build customized energy efficiency improvement plans for their homes over time.

Compared to the existing offerings in the legacy programs, we propose significant modifications in the restructured program. The Whole Building offering will provide the largest divergence from what is currently being offered in the HPwES program. We propose to reduce current incentive by 50%, give customers the option to either receive the incentive or have low interest financing (but not both). It will be critically important to closely coordinate with the marketing firm engaged by the BPU to simultaneously increase marketing efforts to offset the reduced incentive levels. It is important to note that the announced decrease in incentive levels (assuming a 90 day notice period) would likely result in increased short-term spending due to the "rush" to receive the legacy higher incentive levels before the terms expire. Strong trade ally management and support will be vitally important during this transition period but the long term impacts, however, will be dramatically lower incentive costs. Implemented effectively, these program changes will increase program efficiency and cost-effectiveness due to the impact of the long-term program changes with minimal negative impacts on trade ally and customer participation levels.

The major enhancement for the HVAC equipment track will be the movement towards more upstream incentives. Distributors/manufacturers have a much larger influence on the measures customers install compared to other similar markets. By providing incentives to distributors/manufacturers more efficient measures will be available in the marketplace for installation and this has the potential to increase participation. We envision introducing the offer of access to attractive financing to this market, as it has been shown in other jurisdictions to be the residential market in which financing can gain traction most quickly. The Whole Building track will also track and report program savings on net total savings (in MMBTU's) to account for fuel switching.[7] These program changes will increase participation, decrease administrative costs, and increase program cost-effectiveness.

Residential New Construction

The Residential New Construction (RNC) program to date has been successful, in part, due to strong efforts in the market place by home energy raters and consultants. The market share for the new construction program has remained relatively stable during recent years where approximately 25% of all new homes constructed in New Jersey have come through the program. This still leaves a significant opportunity to increase the technical, business and sales capabilities of trade ally partners and industry stakeholders in order to increase both market share and savings potential. The increase in market share will be achieved by supporting implementation of new building codes, expansion of zero energy homes, incorporating demand response capabilities into new homes and renewables ready techniques, collaboration with affordable housing new construction and increasing consumer awareness and demand for efficient homes by working with industry stakeholders to adopt an "energy efficiency" category into the MLS.

We intend to expand the integration of the RNC program with the renewables program to more closely align the two programs by incorporating additional "renewables ready" components into the program. Keeping an eye on the Renewable Energy Ready Homes (RERH) specifications set forth by the EPA, we will work to educate and train builders and raters on techniques for assessing and constructing efficient homes in a manner which makes it easier and more affordable for homeowners to later incorporate renewables (specifically solar electric) systems after the home has been completed.

We propose working with the state's MLS groups and other industry stakeholders, such as appraisers, bankers, builders, architects and construction professionals, to generate support for establishing an "energy efficiency" category. We expect that this new "energy efficiency" criteria will encourage consumer demand for new homes to shift to new *efficient* homes, pushing builders to incorporate energy efficient building techniques and features into their business offering, marketing and sales approach.

[7] For example, if a customer switches from fuel oil to natural gas current reporting shows fuel oil savings and an increase in natural gas usage. By converting all increases/decreases in MMBTUs and showing the net savings, all savings will be properly accounted for.

With the potential for New Jersey to adopt the IECC 2015, we will closely monitor the progress of this adoption and mitigate any negative impacts to the program by working with builders, raters, code officials and other industry stakeholders to help drive code compliance through training and education. As part of the residential program delivery, we intend to use a combination of circuit riders, classroom training, in-field training, and field guides; direct phone technical assistance; and joint training sponsorships with trade associations and product suppliers to reach a wide spectrum of key stakeholders to support implementation of the new building code, and in support of effective adoption of current code standards.

Commercial & Industrial Programs

We have identified a number of adjustments for the portfolio of existing commercial and industrial programs that will reduce administration and transaction costs while improving energy savings per dollar spent:

- **Creation of a new, consolidated "C&I Customer-Tailored" program**. C&I customers have varying degrees of understanding of efficiency opportunities, capital investment cycles, and needs ranging from technical assistance, support to develop internal business cases for investments, and access to capital. Thus, efficiency programs that have overly-prescriptive approaches to the market will tend to have somewhat limited participation and savings.

  This new program will promote comprehensive system solutions and whole building treatment and closely cater to the wide range of opportunities and needs of medium and larger customers. As appropriate, it will have several "tracks" or markets that will intentionally receive specific emphasis in outreach, in recognition of the unique needs of certain market segments and or special capabilities required to promote specific technologies (e.g. CHP). However, those concentrated efforts will be integrated into a broader, more holistic approach to both the market as a whole and to each customer. Thus, this new program will eliminate the need for the current stand-alone Pay for Performance programs, the Large Industrial Energy Users program and the CHP program. It will also house a new "retro-commissioning" service which addresses a key missing link in the existing C&I program portfolio.

- **A major new commitment to an account management model** to promote efficiency and distributed generation to both medium and larger customers and key trade allies. This approach is essential to driving greater participation and deeper savings per participant. It will be particularly important to the success of the new Customer-Tailored C&I program.

- **A reduction in some incentive levels.** Financial incentive levels should ideally be based on assessments of incremental costs, the severity of other barriers to customer investments in the market and consideration of trade-offs between the sometimes competing policy objectives of maximizing "bang for the buck" and ensuring equitable access to efficiency offerings across the state's consumers. In the comprehensive strategic planning process we propose in the last section of this plan, a key element is market

research, one objective of which would be to assess incremental costs, the severity of the market barriers for key efficiency technologies and other factors affecting incentive levels.

In the interim, both our experience in other jurisdictions and anecdotal feedback from our work in New Jersey suggests that incentive levels in the current Retrofit program (which we propose renaming the C&I Prescriptive program) and the Direct Install program can be reduced. The reductions in the C&I prescriptive incentives will be made to work strategically with the new Customer-Tailored C&I program, so that we drive as many C&I customers as possible (particularly larger ones) to the more holistic and comprehensive approach of the Customer-Tailored program.

- **Increased emphasis on financing.** We will coordinate with the BPU to explore expansion of on-bill financing to other utilities or other potential sources of financing. The most notable will be an effort to work with the utilities to develop and implement on-bill repayment of major measures installed through the Direct Install program. The Connecticut utilities have demonstrated that such an approach can result in incentive levels significantly lower than what is currently being offered in New Jersey without losing customer interest, participation and/or savings.

- **A new Retro-Commissioning pilot program.** We propose that a new Retro-Commissioning program be added to the NJCEP portfolio. Retro-Commissioning (RCx) is the process of ensuring an existing building's energy systems are operating at optimal levels in order to reduce energy usage while meeting the needs of the building's owner and occupants. RCx focuses on existing system performance rather than equipment replacement, and typically results in additional benefits beyond energy savings such as lower operation and maintenance costs, improved indoor air quality, and improved comfort. Most existing commercial buildings can achieve measurable energy savings with little or no capital costs through the RCx process.

Table 2 on the following page summarizes the proposed portfolio of C&I programs and the impacts of our proposed changes for the programs on their financial incentive levels, total budgets, participation levels and savings. Each program is described in more detail.

Table 2: Commercial and Industrial Summary Table

Program	Direction of Incentive Levels	Direction of Total Budget	Direction of Participation	Direction of Total Savings
Prescriptive Rebates **1. Retrofit** **2. New Construction**	1. Declining *Reduce incentive levels and reevaluate technologies included. Transition some to customer-tailored (advanced design vs one for one)* 2. Declining	1. Steady to Declining 2. Steady to Declining	1. Steady to Declining 2. Steady to Declining	1. Steady to Declining 2. Steady to Declining
Customer-Tailored Retrofit **1. Single/Multiple Measure** **2. Whole Building** **3. "Strategic Energy Management"** **4. Retro Commissioning** **5. Large Energy Users** **6. Distributed Generation**	1. Increasing 2. Steady to declining 3. Increasing 4. New 5. Steady to Declining 6. Steady	1. Increasing 2. Steady 3. Increasing 4. New 5. Steady to Increasing 6. Steady	1. Increasing 2. Steady 3. Increasing 4. New 5. Steady to Increasing 6. Increasing	1. Increasing 2. Steady 3. Increasing 4. New 5. Increasing 6. Increasing
New Construction **1. Whole Building**	1. Declining	1. Steady to Increasing	1. Increasing	1. Steady to Decreasing
Small C&I Direct Install	Decreasing *Introduce Financing to enable decreasing incentive levels targeting net positive cash flow.*	Decreasing *Program financing increasing*	Steady *Anticipate with proper implementation of financing participation should stay steady.*	Steady
LGEA	Steady to declining	Steady to increasing *(if LGEA scope is broadened, otherwise declining)*	Steady to increasing *(if LGEA is broadened, otherwise declining)*	Increasing *(track projects resulting from audit, otherwise N/A)*
SBC Credit	Increasing (New program – anticipating FY16 launch	New	New	New

C&I Prescriptive Program

The C&I Prescriptive program will be an evolution of the current SmartStart Buildings program. This program is designed for customers who are in the market for single projects and are not prepared to perform more comprehensive whole-building type projects. This program allows customers initial entry into the energy efficiency market without making large capital expenditures that are generally needed for more comprehensive projects. This program is necessary because it minimizes lost opportunities for customers who are in the market to purchase new equipment, but would not have moved to high efficiency equipment without the program.

The primary initial activity is the re-evaluation of measures currently offered in the program with two goals in mind: remove underperforming or non-cost-effective measures and decrease incentive levels where appropriate. Program participation, budget, and savings are expected to remain steady or decline slightly due to the program changes. Program cost-effectiveness is expected to increase due to the promotion of more efficient measures that are desirable in the marketplace.

C&I Customer-Tailored Program

The Customer-Tailored program is a new approach to the NJCEP that offers the ability to work with customers on a wide range of projects that might include a small number of measures, whole systems, whole building approaches, retro-commissioning, or even longer-term whole business energy plans (such as strategic energy management). This program will take the account-management approach where participants work with a dedicated account manager to fully scope out their project and determine the best approach for project installation or implementation. The Customer-Tailored program addresses the need for projects that do not fit into the traditional Prescriptive program. It addresses a large continuum of customer interests, needs, and opportunities. From a customer perspective, customer-tailored projects typically require a significant capital investment that results in operational efficiency improvements.

The newly created Customer-Tailored program will eliminate the need for the current Pay for Performance Existing Buildings, Large Energy Users, and CHP programs since all of the offerings of those programs can fall under the umbrella of the new Customer-Tailored program. The elimination of these programs decreases the administrative burden of running them individually, and thereby lowers administrative costs. Consistent with best practices for Customer-Tailored programs, the program will offer incentives on a tiered $/kWh-saved basis. This drives participants to the most comprehensive approach, increases the cost per energy saved, and increases program cost-effectiveness. Targeted marketing, in combination with the account management approach, is key to the success of this program. High-impact sectors such as hospitals, schools, data centers, government entities and grocery stores will be targeted in an effort to maximize the cost per energy saved and increase program cost-effectiveness.

Commercial New Construction Program

The Commercial New Construction program encourages customers and builders to incorporate energy efficiency into newly constructed buildings or major building renovations. The most important changes from the existing program are the introduction of the account-manager approach and combination of C&I New Construction and Pay for Performance New Construction programs into a single program with two paths – a 'fast-track prescriptive' path for smaller buildings and a 'performance' path for larger buildings with complex building systems. This approach will help maximize program savings and improve cost-effectiveness. Program participation, incentives, and savings are expected to remain steady in this program cycle. Further, we propose reducing incentives (i.e. Pay for Performance New Construction incentives) by at least 40% so that this program aligns with similar peer programs across the country. Currently, Pay for Performance New Construction incentives are almost double compared to similar whole building new construction programs.

Direct Install Program

The Direct Install program will be a continuation of the existing program with modifications aimed at improving program efficiency and decreasing program costs. The Direct Install program will be directed at small businesses that typically have high barriers to entry in energy efficiency programs due to lack of capital, education, or market uncertainty. As currently delivered, the Direct Install program utilizes a larger portion of commercial and industrial funds than is warranted at this time. One mechanism for increasing cost effectiveness and lowering incentives will be for contractors to re-bid their services, which could reduce measures costs by up to 15 to 20 percent.

Customer incentives will be reduced for specific measures, with significant incentive reductions possible for larger measures. This would be achieved by capitalizing on the reduction in material cost that has occurred since the project was originally bid as well as the elimination of uncertainty and price risk as this program is now established. The lower incentives will be combined with increased program financing options in order to further reduce program costs, which will cause total budgets to decrease, but participation and program savings should remain steady due to the increased options.

The introduction of the installation of specific no-cost measures (e.g. low flow aerators, LED screw-in bulbs, etc.) will increase program savings (current conversions of audits to installations is approximately 10-20%) and will entice customers to invest in the remaining cost-share measures in order to increase conversions. Lastly, we recommend performing audits in-house to allow for more direct accounting of program administrative costs and significantly reduce the cost per audit. This will also allow for a wider group of contractors to deliver installation services, meet higher participation goals, and create additional green collar jobs. We present the change to perform audits in house as an optional implementation approach in our Technical proposal.

Local Government Energy Audits

The Local Government Energy Audits (LGEA) program provides free ASHRAE Level II audits to local government entities, county and state colleges/universities, and non-profits. The general purpose of the program will remain consistent, but several changes can be made to improve program efficiency, lower program costs, and make the program able to claim verifiable savings. The main change we are proposing is to perform the audits in-house. Performing the audits in-house will improve program delivery, provide more consistent audit results, and lower both administrative costs and the cost of performing the audits.

Proposed Retro-Commissioning Pilot Program

Retro-Commissioning (RCx) is the process of ensuring an existing building's energy systems are operating at optimal levels in order to reduce energy usage while meeting the needs of the building's owner and occupants. It involves the assessment of building performance and implementation of operational efficiency measures such as improved use of energy management systems controls, cleaning and calibration of equipment, and installation of low-cost/no-cost measures such as ventilation and lighting controls. RCx focuses on existing system performance rather than equipment replacement, and typically results in additional benefits beyond energy savings such as lower operation and maintenance costs, improved indoor air quality, and improved comfort. Most existing commercial buildings can achieve measurable energy savings with little or no capital costs through the RCx process.

We propose to establish this program on a pilot basis due to the unique nature of RCx. ASHRAE has developed *The Commissioning Process Standard 0-2005*, which will be used as a general reference document for the RCx pilot program development. We will identify through an RFQ process, a qualified but limited number of RCx contractors who demonstrate a minimum level of experience to successfully perform RCx activities under the pilot parameters.

The RCx Pilot program is proposed as a service-incentive program. This means that the RCx analysis and implementation assistance is the incentive to the customer and is partially-funded by the NJCEP. We will work with the BPU to develop proposed incentive levels.

The RCx Pilot program will be marketed through existing NJCEP contacts and will include ongoing outreach to professional organizations such as P4P partners, Direct Install contractors, architects, engineers, and industry associations. The RCx Pilot program will leverage the existing benchmarking offering to target customers with unusually high energy use, persistent failure of equipment and controls, tenant complaints, or indoor air quality problems. For any capital improvements identified during the course of retro-commissioning, the account manager and/or project manager will direct the customer to the relevant equipment incentive programs. Similarly, projects in other programs that primarily identify RCx opportunities will be directed to this program.

Our experience has shown that one of the primary market barriers an RCx Pilot program needs to overcome is a perception that operations and maintenance improvements are not effective at controlling energy costs. Assuming initial success of the pilot, we propose to enhance the RCx

Pilot program by implementing a similar program design to accommodate the needs of various-sized customers by offering two distinct levels of service:

- **Enhanced O&M Services.** The Enhanced Operation and Maintenance (EO&M) Services level would be available to all C&I customers, but typically it would target commercial facilities that are *less than* 75,000 square feet and not operationally complex. This offering may include industrial process systems. This service offering is designed to have a streamlined approach that focuses primarily on RCx measures expected to yield the most immediate return on investment.

- **Full RCx Services**. The Full RCx Services level is more comprehensive than the EO&M Services. It provides for a deeper investigation phase and more comprehensive implementation recommendations. Full RCx Services are typically available to facilities that are *greater than* 75,000 square feet, have an energy management system with comprehensive direct digital control and complex HVAC systems.

Once the RCx process is complete, we propose that a post-retrofit benchmark be performed to demonstrate actual savings achieved as a result of RCx performed. We recommend gradually moving incentives to a cost-share structure with a larger percentage of costs paid by the customer. Long-term, we envision that the Customer-Tailored program discussed above will incorporate RCx and a stand-alone program will not be required.

Our experience with program trade allies is that many of them have extensive capability in commissioning, RCx, and monitoring-based commissioning. This program would open an entirely new services sector that would create opportunities for job growth for trade allies, as well as bring in new companies to provide services in New Jersey.

Cross-Sector Efficiency Programs

Not all of the programs we recommend fit neatly into either residential or commercial and industrial portfolios. We recommend that programs with cross-sector impacts be designed as stand-alone programs. New Jersey does not currently offer any such programs that affect and are marketed to multiple sectors simultaneously. We recommend two programs be considered for implementation: Multifamily and Codes and Standards Support.

Multifamily Program

The multifamily retrofit market is complex in nature because it deals with two separate sectors that have very different needs and technology requirements: building owners and unit occupants. Building owners are typically interested in major measures (HVAC and thermal shell) and common-area components (lighting, insulation, etc.). Unit occupants typically do not own the unit they live in so they are interested in low/no cost measures that decrease their energy bills with little to no capital expenditures. The Multifamily program will address these two components: common area elements and tenant usage.

We recommend the design and implementation of a single Multifamily program to serve all existing and new construction projects. We envision that a *fast-track prescriptive* path would be

available for smaller facilities while a *performance* path would apply to larger facilities. The new program would align with ENERGY STAR requirements where possible, such as ENERGY STAR Homes, ENERGY STAR Multifamily High Rise, and Home Performance with ENERGY STAR. This new program would also be a prime target for a new financing program given that this sector has indicated that lack of access to capital is a barrier to the installation of energy efficiency measures.

This program will rely heavily on the account-manager approach as building owners and managers will be targeted for participation. Both private and subsidized housing will be targeted, with an emphasis on in-unit direct install for subsidized housing due to that market's typical barriers to entry and participation in energy efficiency programs. This program will have an increased emphasis on financing measures that are more capital intensive to test this specific market to determine what is possible in terms of financing for the multifamily sector.

Codes and Standards Support

Advanced codes and standards (C&S) offer tremendous potential for energy savings in New Jersey. They have several advantages over the more traditional incentive programs:

- C&S apply to all buildings, not just those that can be enticed to participate in a program;
- C&S change standard practice, product stocking, etc., permanently transforming the market;
- Financial incentives are not needed for every transaction; and
- Investments in C&S efficiency are made only once, to get the C&S upgrades.

In California, for example, C&S savings have grown to the point that they contribute more than 30% of the savings achieved by the entire efficiency portfolio, and the cost per unit energy savings is the lowest of any program offered.

To achieve a successful C&S program, however, requires a long term commitment to put the necessary infrastructure in place. This would include some key policies:

- Establishing an effective baseline of where current building practices are relative to the most recent code adoption;
- Adopt a protocol for measuring and recognizing energy savings attributable to C&S program efforts (California has such a protocol which could serve as a model);
- Work with NJ codes and standards authorities to gain buy-in for a BPU program role in C&S development such as training and outreach to the building trade ally sector (authorities typically focus on training code officials first);
- Coordinate with federal appliance standards authorities on development of new appliance standards;
- Develop a formal process for proposing C&S enhancements, and define the C&S program role in that process; and

- Develop a compliance enhancement program element, in cooperation with NJ C&S authorities.

Because a comprehensive C&S program can require many years to fully develop, we recommend that this effort be funded as an exploratory program for the first one to two years of the program cycle. This would allow time to map out the policy infrastructure for a C&S program and gain support from other stakeholders. There would be no immediate energy savings expectations from this investment. After that initial investment, it will be possible to project timelines and savings expectations for a long-term C&S program.

Renewable Energy Programs

The renewable energy portfolio currently consists of two main components: the Solar Renewable Energy Certificate Registration Program (SRP), and the Renewable Energy Incentive Program (REIP). The overall objective in managing the renewable energy programs is to assist in transition of the programs to market based, finance based incentives and to develop an approach to leveling the peaks and valleys in Solar Renewable Energy Credit (SREC) prices to enable a consistent and lowest cost path to meeting the State's Renewable Portfolio Standard (RPS) requirements.

Solar Renewable Energy Certificate Registration Program (SRP)

The current SRP program uses a combination of manual and automated services for SREC registration. Full automation of the SREC registration process is the ultimate goal of this program. The automation will significantly reduce costs and simplify reporting. This will result in additional transparency to the renewable markets, allow contractors and customers to view on-line the status of any application, and significantly improving customer satisfaction. We will have a fully automated, on-line, SREC registration platform up and running by the end of the 90 day transition period.

Renewable Energy Incentive Program (REIP)

The Renewable Energy Incentive Program currently includes the development and issuance of solicitations for biomass and renewable storage projects. In FY16 the BPU will be exploring alternatives to competitive solicitations. Our team will provide subject matter expertise to assist the BPU is assessing the pros and cons of alternative approaches to issuing solicitations. A main focus will be on eliminating non-financial barriers to the development of these projects in order to drive higher participation in order to assist the state in meeting its Renewable Portfolio Standards (RPS) goals. A recommendation for streamlining this program and reducing administrative costs is to combine the REIP with the Distributed Generation portion of the newly created Customer-Tailored Program. Efficiencies would be gained due to the large amount of overlap between biomass and renewable storage projects and distributed generation such as interconnection, standby rates, technology specifications, etc. As noted above, account management will be an important component of the new program.

5.1.3 Estimates of Program Savings and Budgets

In this proposal, we provide a preliminary analysis of what budgets would be required, realistic, and relevant for achieving New Jersey's clean energy goals and objectives for FY16 through FY19. We provide estimates of the corresponding annual and lifetime energy savings that would accrue, specifically from the energy efficiency activities.[8] As mentioned in our introduction, this preliminary analysis would be revisited and refined during FY16 if our team is selected for the project.

Methodology for Developing Program Savings and Budgets

Per Staff's CRA Straw Proposal dated May 5, 2015, the proposed level of new funding for FY16 for the programs that are covered under this plan and proposal will be $213,676,000. This provided the starting point for our analysis. With the overall new funding levels in place, we allocated funds to individual programs based on historic program budgets as well as the strategic concerns described in the previous section. This allocation was informed by our detailed review and analysis of program data from 2010 to present, looking at trends in spending and saving, cost per unit saved, and allocation of dollars and savings by fuel type. Where appropriate, we mirrored those trends; and where strategic improvements could be made, we applied modifications.

Once the new levels of FY16 funding were appropriately defined for each program and fuel, we developed first-year costs per unit of savings (dollars per annual kWh saved and dollars per annual therm saved); also based on program history with efficiencies and decreases where we identified strategies for improvements. Dividing annual budgets by this unit cost yielded annual, incremental savings targets by program and fuel.

With the first-year savings levels established, we then developed assumptions for the average lifetime of savings for each program so that we could calculate the estimates of lifetime savings we discussed earlier as a critical, new data element. A program will likely be composed of multiple different measures with unique lifetimes, so a single program lifetime is a simplification at this point, but one that will provide reasonable accuracy and one that is readily updated later in the plan refinement tasks during FY16.

Next we adjusted the incentive levels downward at a rate up to 50% annually in some cases for programs where improvement strategies had been identified. This was done by adjusting the unit cost of savings going forward.

This resulted in a reference case for both electric and non-electric efforts (where non-electric is overwhelmingly natural gas, but also includes savings and conversions from fuel oil and propane customers). In addition, we developed "Low" and "High" portfolios. In the High portfolio, the budgets were increased by 20% and the unit costs were increased by 10%. This aligns with the observation that EE programs operate along a market supply curve where achieving marginally

[8] For completeness with respect to the NJCEP comprehensive budget, this plan has itemized program costs for RE and CHP but does not at this time attempt to quantify or include their energy impacts.

higher savings means obtaining the participation of progressively less motivated customers at a progressively higher unit-cost basis. Conversely, in the Low portfolio, the budgets were reduced by 20% and the unit costs were reduced by 10%, reflecting that proportionately more of the savings are low-hanging fruit that is harvested more readily at a lower unit cost.

It is important to note that a large portion of savings that can be achieved will need a robust marketing effort in order to achieve program goals. If selected, we will work closely with the selected marketing firm to help the state achieve its goals at the lowest cost. The collaboration between the administrative/implementation team and the marketing team will be key across all programs and sectors.

Summary of Results Forecast

Figures 3 and 4 below show the total savings accrued by the programs over the entire life cycle of all measures installed or taken during the 4-year planning period and compares it to historic achievements.

Figure 3: Net Lifetime Electric Savings (GWh)

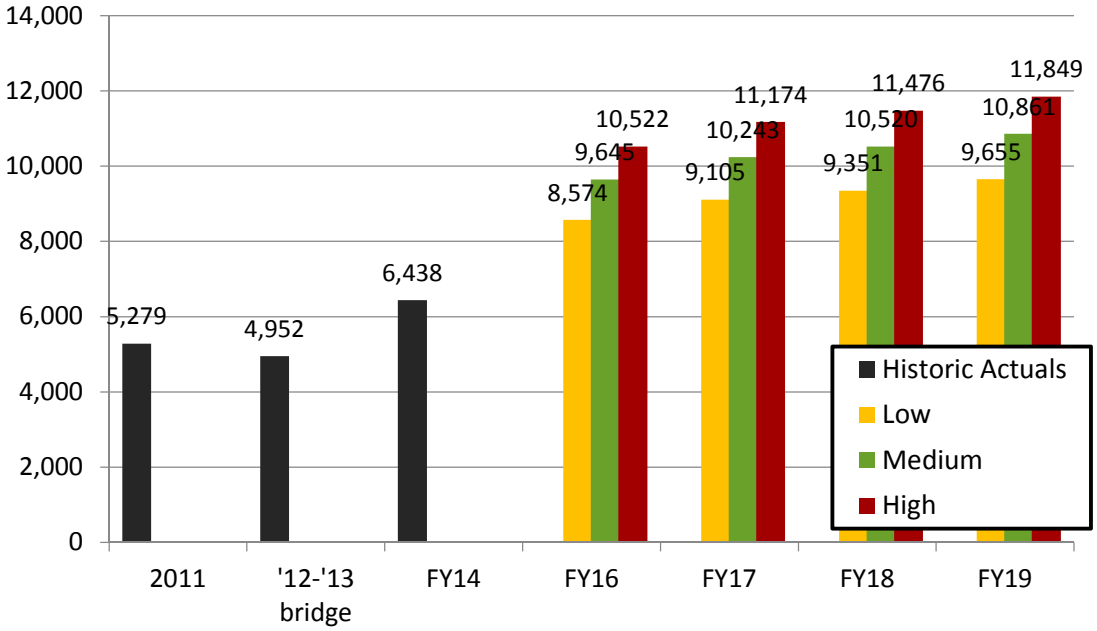
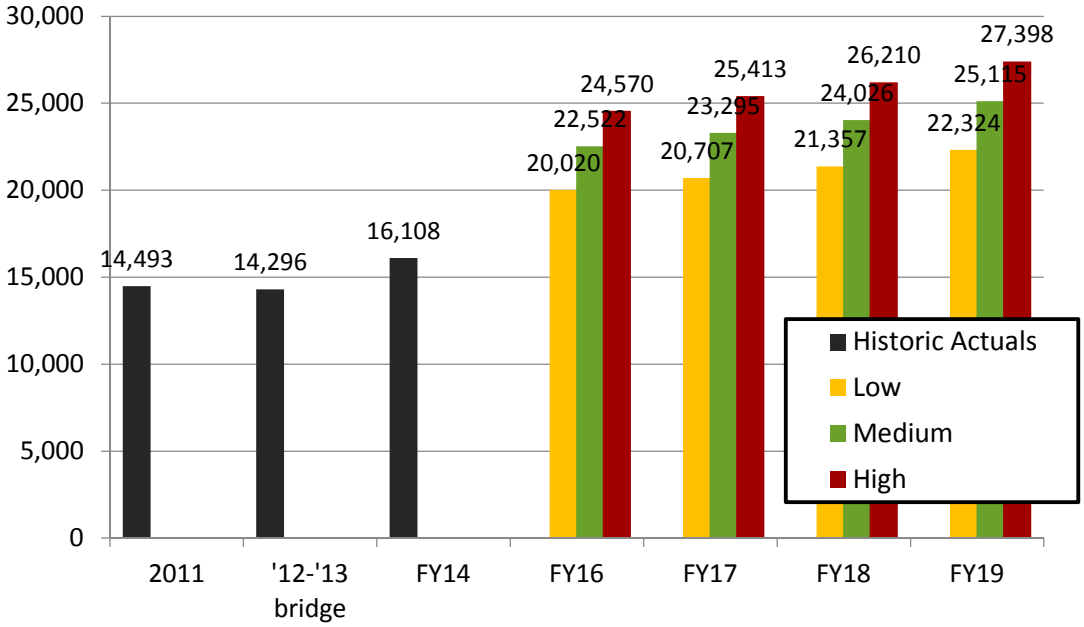


Figure 4: Net Lifetime Non-Electric Savings (billion BTU)



Please note that the 2012-2013 bridge was an 18 month period shifting from calendar years to program years, and it has been annualized for these figures. Figures 5 and 6 pictured here show the incremental or annual savings targets for programs in each year of the 4-year planning period and compares it to historic achievements.

Figure 5: Net Annual Incremental Electric Savings (GWh)

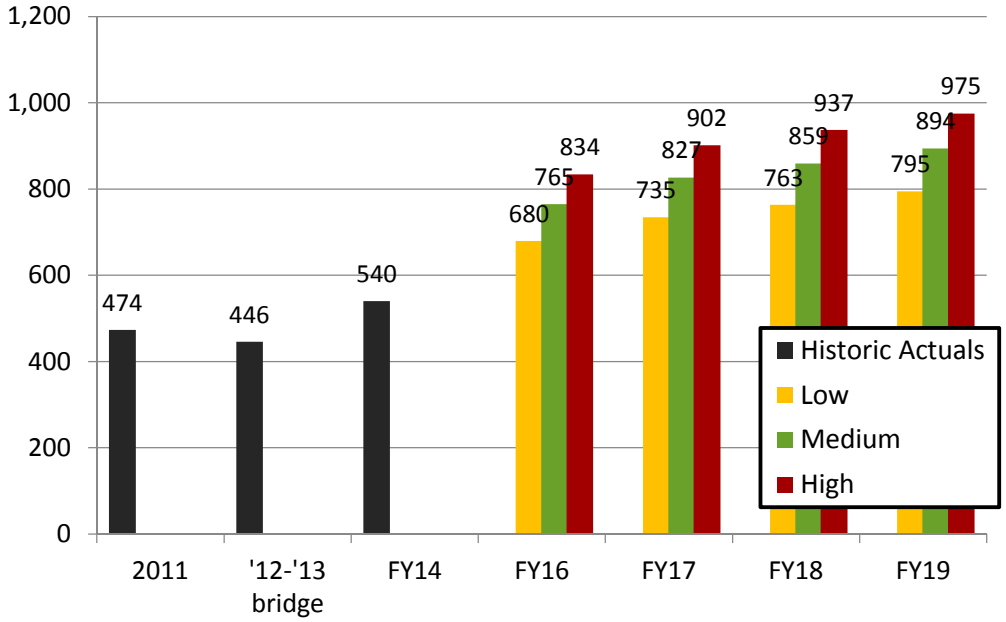
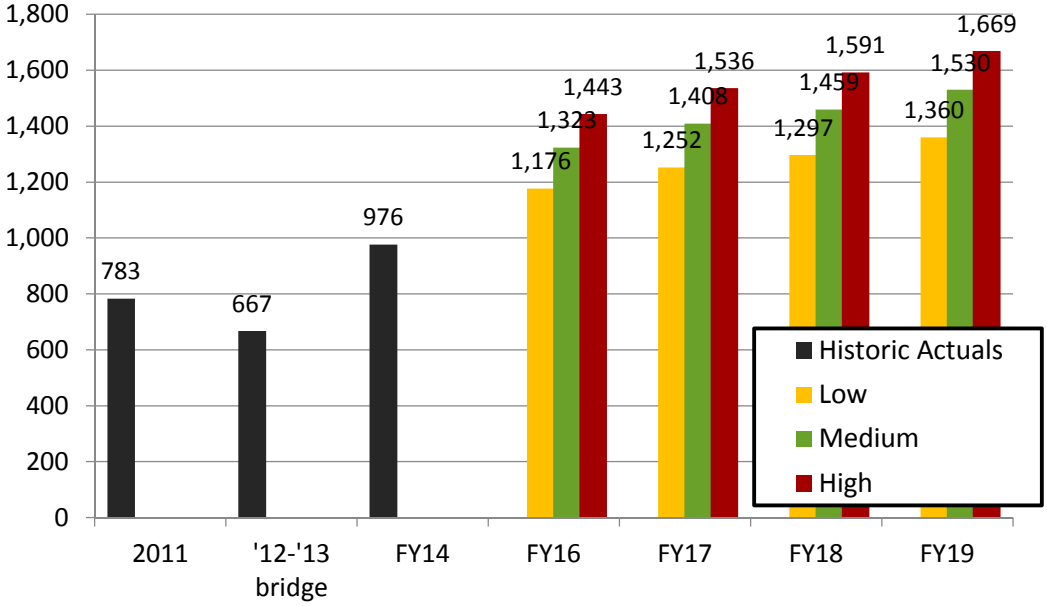


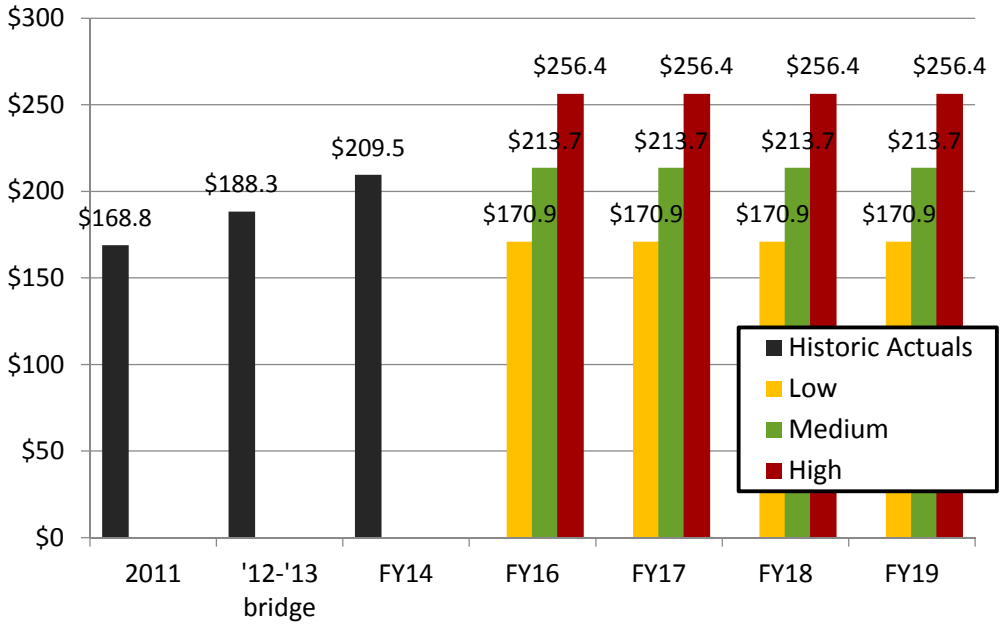
Figure 6: Net Annual Incremental Non-Electric Savings (billion BTU)



The graph in Figure 7 provides information on the new spending levels for the overall portfolio necessary to achieve the identified savings targets for the High, Low, and Medium cases. It compares these levels to historic program spending.[9] The Medium case is set at the level identified by the CRA Straw Proposal for all program years.

[9] The 2012-2013 bridge period of 18 months was adjusted to be an annualized number.

Figure 7: Total Program Budgets ($ millions)



The program savings experience a somewhat slower ramp up through FY16 because the refinements and enhancements will take an estimated six months to introduce and become fully transitioned. We then anticipate ramping up steadily through FY17 and 18, where we will be able to install larger projects and land more "big fish." The steady state achieved by this period will continue into FY19.

The savings targets make a substantial improvement relative to historic programs, but there are a number of factors that make this a well-rounded, holistic portfolio that will tend to limit savings that are substantially higher than those planned here. This complexity comes from very worthy factors such as policy objectives for well-balanced program offerings to all sectors/segments, robust low-income spending and inclusion, and multi-pronged portfolios for both residential and business customers. The ramp up and transition phases will also be limiting factors.

The table on the following page gives an itemized breakout of the new funding requirements by program category for the Medium Case only, as well as the allocation to electric and natural gas programs. Overall, the spending is about 65% dedicated to electric savings and measures, and 35% dedicated to natural gas and other non-electric measures. For the sake of brevity, we have omitted the detail on the High and Low cases, which are simply 20% above or below these levels.

Table 3: Annual New Spending Levels by Fuel and Program Category

Program	Program Spending ($millions)				Electric Program Spending (000$)				Non-Electric Program Spending (000$)			
	FY16	FY17	FY18	FY19	FY16	FY17	FY18	FY19	FY16	FY17	FY18	FY19
Residential EE	$66.8	$66.8	$66.8	$66.8	$28.8	$31.1	$31.3	$31.6	$38.0	$35.7	$35.5	$35.2
Low Income	$30.0	$30.0	$30.0	$30.0	$12.0	$12.0	$12.0	$12.0	$18.0	$18.0	$18.0	$18.0
C&I EE	$82.4	$83.4	$84.4	$85.4	$66.0	$66.6	$67.2	$67.5	$16.3	$16.8	$17.2	$17.9
Renewable Energy	$11.0	$10.0	$9.0	$8.0	$11.0	$10.0	$9.0	$8.0	$0.0	$0.0	$0.0	$0.0
CHP-FC	$14.8	$14.8	$14.8	$14.8	$14.8	$14.8	$14.8	$14.8	$0.0	$0.0	$0.0	$0.0
NJCEP Administration	$8.7	$8.7	$8.7	$8.7	$6.1	$6.1	$6.1	$6.1	$2.6	$2.6	$2.6	$2.6
TOTAL	**$213.7**	**$213.7**	**$213.7**	**$213.7**	**$138.7**	**$140.5**	**$140.4**	**$139.9**	**$74.9**	**$73.1**	**$73.3**	**$73.7**

The table below gives a similar breakout of the new funding requirements by program category for the Medium Case, but provides the allocation to incentive and non-incentive spending. Overall, the spending is about 82% dedicated to incentives and 18% dedicated to non-incentive costs such as administration, planning, tracking, marketing and evaluation.

Table 4: Annual New Spending Levels by Incentive and Non-Incentive Dollars

Program	Program Spending ($millions)				Incentive Spending (000$)				Non-Incentive Spending (000$)			
	FY16	FY17	FY18	FY19	FY16	FY17	FY18	FY19	FY16	FY17	FY18	FY19
Residential EE	$66.8	$66.8	$66.8	$66.8	$58.2	$57.7	$57.1	$56.5	$8.6	$9.1	$9.7	$10.3
Low Income	$30.0	$30.0	$30.0	$30.0	$27.3	$27.3	$27.3	$27.3	$2.7	$2.7	$2.7	$2.7
C&I EE	$82.4	$83.4	$84.4	$85.4	$70.4	$69.2	$68.8	$68.2	$12.0	$14.2	$15.6	$17.1
Renewable Energy	$11.0	$10.0	$9.0	$8.0	$9.2	$8.2	$7.3	$6.4	$1.8	$1.8	$1.7	$1.6
CHP-FC	$14.8	$14.8	$14.8	$14.8	$13.6	$13.6	$13.6	$13.6	$1.2	$1.2	$1.2	$1.2
NJCEP Administration	$8.7	$8.7	$8.7	$8.7	$0.0	$0.0	$0.0	$0.0	$8.7	$8.7	$8.7	$8.7
TOTAL	**$213.7**	**$213.7**	**$213.7**	**$213.7**	**$178.7**	**$176.0**	**$174.1**	**$172.0**	**$35.0**	**$37.7**	**$39.6**	**$41.7**

The summary table below gives a snapshot overview of the incremental savings targets for each program category and fuel. This is provided for the Medium Case only for the sake of brevity. The high and low cases are roughly 10% above and below these values respectively.

Just below the table you can see the percent change relative to FY14. **The first year of the newly re-imagined program cycle shows significant savings growth of approximately 40% relative to FY14, despite roughly equivalent spending levels.** By the end of the cycle, the level of annual portfolio savings rises above FY14 by 66% for electricity and 57% for natural gas, fuel oil, and propane.

On a year-to-year basis, FY16 is the largest step change, while FY17 has significant growth as well, and the portfolio steadies out with 4% to 5% growth in the final two years.

Table 5: Summary of Incremental Savings Targets by Program Category

Program	Net Annual Incremental Electric Savings (GWh)				Net Annual Incremental Non-Electric Savings (billion BTU)			
	FY16	FY17	FY18	FY19	FY16	FY17	FY18	FY19
Residential EE	358	384	405	428	487	491	493	494
Low Income	8	8	8	8	90	90	90	90
C&I EE	296	335	347	362	746	827	876	945
Renewable Energy	21	20	18	16	0	0	0	0
CHP-FC	81	81	81	81	0	0	0	0
NJCEP Administration	0	0	0	0	0	0	0	0
TOTAL	**765**	**827**	**859**	**894**	**1,323**	**1,408**	**1,459**	**1,530**
Total % Change vs FY14	*+42%*	*+53%*	*+59%*	*+66%*	*+36%*	*+44%*	*+49%*	*+57%*

5.1.4 Financing

Overview

Although an increased emphasis on financing is integrated into our preliminary portfolio and program-specific recommendations noted above, and would be part of the more detailed planning process we have proposed, we have included additional discussion here to ensure a full description of the role that we would expect financing to play in these efforts.

Energy efficiency and clean energy financing have reached a "critical moment" of maturity in the energy efficiency industry. Numerous examples of secondary market investments in clean energy financing structures have been documented around the country, and new entrants such as equity investors and venture capitalists are continuing to move into the market.[10] Advocates like the Investor Confidence Project have made great strides in numerous U.S. jurisdictions, and now even in Europe, toward ushering in further investment by standardizing energy project lifecycles and building investor confidence in energy project performance. Public-private partnerships and innovative new entities focused on resiliency and clean energy have begun to bridge gaps between energy projects and private capital providers. In this environment, the prospects for innovative financing structures to play a key role in the leveraging of private capital to support expansion of the clean energy markets looks as bright as ever.

At the same time, the growth of this market has revealed important lessons regarding financing's ability to overcome persistent barriers to energy efficiency investment. Increased data collection on lending activity, cross-referenced with information on where the greatest gaps lie between customer demand and achievable savings potential, has helped paint a more complete picture of the areas where financing strategies are most effective and where they may fall short on their own. Financing evaluation, a nascent but rapidly developing field, has begun to shed light on financing's ability to generate additional net savings above and beyond naturally occurring energy efficiency. Pilot programs have provided opportunities for careful observation and analysis of the prospects for using financing as a tool to achieve big-picture scale.

The AEG team is well versed in both the cutting-edge developments that herald a significant ramp-up in energy efficiency and clean energy financing activity, as well as critical new experiences that offer a more nuanced understanding of how best to use financing as a strategy to achieve overall clean energy goals.

AEG Team Approach

As a starting point, we emphasize that the AEG team would take a "holistic" perspective to the expansion of financing as a strategy to achieve energy efficiency and clean energy goals. This

[10] See Kramer, C., et al., "Accessing Secondary Markets as a Capital Source for Energy Efficiency Finance Programs: Program Design Considerations for Policymakers and Administrators," State and Local Energy Efficiency Action Network, Financing Solutions Working Group, February 2015, https://www4.eere.energy.gov/seeaction/system/files/documents/secondary_markets_0.pdf.

subsection summarizes the team's overall perspective on financing opportunities and challenges within the market, which would help guide our approach to financing throughout our design and implementation work. As a general matter, this overview suggests the following:

1) Where market demand is already high, program financing may expand more rapidly.[11] However, it will be important to ensure that this expansion represents new activity and "additional" incremental savings, rather than a substitution for private-market financing alternatives.

2) Where market demand is lower, financing alone may not be sufficient to drive demand and overcome the wide range of barriers that may exist. However, financing may play an important role in conjunction with other strategies to move projects forward or drive deeper savings once demand has been generated.

Evidence from existing large-scale financing programs around the country lends support to this general framework. For instance, many of the nation's largest residential financing programs have supported very large percentages of HVAC, windows, and solar installations (which tend to have a relatively high degree of naturally occurring demand), but very small percentages of insulation, air sealing, and other weatherization measures (where savings potential is high, but demand tends to be much lower). For example:

- The Massachusetts HEAT Loan program, which finances about $100 million in projects annually, consists of 80% HVAC installations and only 3% weatherization measures.[12]

- The California "HERO" property assessed clean energy (PACE) program, which has securitized $600 million in energy efficiency and clean energy projects, has historically financed 90% HVAC, windows, and solar projects, but only 6% insulation and air sealing.[13]

- The Keystone HELP program in Pennsylvania, which has financed over $100 million in energy efficiency projects, describes 85% of those projects as single-measure "reactive" projects, while only 15% are more comprehensive "proactive" projects.[14]

[11] This is consistent with many of the highest-volume energy efficiency and clean energy financing programs in the market today, which largely support project types that are associated with strong naturally occurring demand (e.g., solar, HVAC, and windows).
[12] Geoff Phillips, Northeast Utilities, verbal comments during AESP's online conference, "Making Dollars and Sense of Energy Efficiency Financing," September 16, 2014.
[13] Data on product types received from Barbara Spoonhour, Director of Energy and Environmental Programs, Western Riverside Council of Governments, December 18, 2012.
[14] Peter Krajsa, "Smart Underwriting to Create a Product, Efficient Delivery to Close the Deal: Keystone HELP – Case Study," Keystone Energy Efficiency Alliance, May 8, 2012.

In all of these states, there is significant savings potential in the types of projects generally not being captured through financing, while the "net" additional savings achieved through program financing has yet to be measured against naturally occurring efficiency. These basic principles laid out above are described in more detail in the table below, which provides a high-level market segmentation that correlates project and customer types with typical levels of existing demand.

Table 6: Financing Opportunities and Challenges

Level of Demand	Typical Project Type	Typical Customer Type	Financing Opportunities	Financing Challenges
High	**"Need It"** Non-discretionary (e.g., HVAC replacement)	Highly motivated	Often the highest loan volume (not necessarily highest savings potential). For motivated customers, financing may help them say yes and/or influence point-of-purchase efficiency decisions.	Highly motivated customers may have moved forward w/o program financing. Design and evaluation should minimize substitution of private financing and ensure "net" savings are additional to naturally occurring efficiency.
Medium	**"Want It"** Discretionary, but often highly desired (e.g., solar PV; windows)	"On the fence"	Can spur investment by making a project more attractive and affordable or addressing other challenges (e.g., split incentives, transferring with meter, etc.).	As above, must evaluate "net" savings among customers who are already motivated, especially where there are private financing alternatives. Financing alone may not spur unmotivated customers.
Low	**"Could Do Without It"** Discretionary, often high savings potential but low levels of observed demand (e.g., comprehensive projects; weatherization)	Unmotivated / Unaware	May have high savings potential, but loan volume can be a challenge. Other strategies may be needed to drive demand first, but financing can then make projects more affordable and attractive.	Despite high savings potential, these projects often face a wide range of market barriers in addition to upfront cost. Financing alone is unlikely to overcome all barriers, but can work in conjunction with other strategies to facilitate these types of projects.

At the core of this segmentation is the key concept that financing is often an essential facilitator of energy efficiency and clean energy projects, particularly where there is pent-up naturally occurring demand, but that its ability to drive additional demand among projects or customers with lower demand remains somewhat uncertain.[15] Capturing savings from all of these project types, however, is essential to achieving overall policy goals, and may require a combination of

[15] See, e.g., Zimring, et al., "Getting the Biggest Bang for the Buck: Exploring Rationales and Design Options for Energy Efficiency Financing Programs," Lawrence Berkeley National Lab, December 2013, p. 17.

financing and other strategies. The AEG team would use its extensive knowledge of energy efficiency and clean energy financing to expand its reach in areas that present clear opportunities, while exploring and evaluating additional prospects for further integration of financing throughout other areas of the portfolio.

Incorporating Financing into Future Potential Studies

A portfolio-wide exploration of financing's potential should be incorporated into the proposed energy efficiency potential study. Several states have begun to examine the potential of financing to help further overall energy efficiency and clean energy objectives. For example, California incorporated an assessment of financing potential into both its 2013[16] and 2015[17] energy efficiency potential studies. New York conducted a "market assessment," similar in some ways to a potential study, in connection with the establishment of the New York Green Bank, although this analysis did not incorporate a bottom-line estimation of financing's achievable savings potential.[18] Incorporating financing as a particular area of focus within the context of a potential study will provide a more complete picture of the opportunities to implement financing as a tool to achieve energy efficiency and clean energy goals.

Mapping Financing Products onto Markets

A strong energy efficiency financing strategy also requires a thorough understanding of how specific financing solutions map onto particular markets, as well as a solid grasp on the relative pros and cons of each particular financing product. The growth in energy efficiency financing over the past several years has provided a wealth of information regarding the benefits and challenges that certain financing products have presented with regard to particular market segments. The table below provides a strategic overview of the energy efficiency financing landscape, noting key opportunities and observations with regard to specific financing products in specific markets. As the table indicates, not all financing products are equally applicable to all markets. The AEG team would leverage its expertise to tailor appropriate financing solutions to their most suitable market sectors.

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[16] Navigant, "2013 California Energy Efficiency Potential and Goals Study," Final Report, February 14, 2014, pp. 90 – 88 and 145 – 149, http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M088/K661/88661468.PDF.

[17] Navigant, "2015 California Potential and Goals Study," Draft Results Presentation to Demand Analysis Working Group (DAWG), March 17, 2015, Slides 70 – 75, http://www.cpuc.ca.gov/NR/rdonlyres/1D3525C7-7145-4AD5-80A8-55515B066223/0/2015PGStudyMarch17DAWGPublicWorkshop.pdf,.

[18] Booz&Co, "New York State Green Bank: Business Plan Development," Final Report, September 3, 013, pp.13 – 22, http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={52B09652-1BA1-4B85-845C-B6F05185E692}.

Table 7: Strategic Overview of the Energy Efficiency Financing Landscape

	MUSH	Large C&I	Small Business	Multi-family	Single Family	Examples	Opportunities and Observations
ESCOs/Performance Contracting	✓	✓				Connecticut Lead by Example; Delaware Sustainable Energy Utility; NJ Local Government Energy Audit Program	Programs can provide innovative and attractive financing options, standardize contract documents, and help participants negotiate deals
Energy Service Agreements		✓				Metrus Energy; SCIenergy; NY Green Bank & Deutsche Bank partnership	Offers a managed shared-savings solution for large C&I customers and may qualify for off-balance-sheet treatment.
Power Purchase Agreements	✓	✓	✓	✓	✓	Solar City; Sunrun; MEETS	Primarily renewables; "MEETS" pilot exploring efficiency PPA in Pacific Northwest for large C&I
Leasing Structures	✓	✓	✓	✓	✓	Washington State Local Option Capital Asset Lending (LOCAL) Program; CT Solar Lease; NY Green Bank/Bank of America leasing partnership	For EE, primarily commercial/MUSH. For RE, solar leasing has expanded across market sectors. May be opportunities to combine RE/EE leasing.
PACE		✓	✓	✓	✓	Connecticut C-PACE program; CA Multifamily PACE pilot; Renovate America "HERO" single family program	Some residential programs have taken off, despite regulatory hurdles, but often fund single-measure upgrades; C&I volume is lower but growing, and product has helped drive comprehensive projects

	MUSH	Large C&I	Small Business	Multi-family	Single Family	Examples	Opportunities and Observations
On-Bill	✓	✓	✓	✓	✓	National Grid C&I on-bill program; PSE&G multifamily program; NYSERDA residential on-bill recovery program	Can provide flexible underwriting and help address other barriers, such as transferability and split incentives, depending on specific structure
Warehousing / Asset-Backed Securitization		✓	✓	✓	✓	Warehouse for Energy Efficiency Loans (WHEEL); Kilowatt Financial	Offers large capital pool, and (for residential sector) turnkey financing solution, but may come with higher financing/transaction costs
Lender Networks				✓	✓	Massachusetts HEAT Loan Program; Michigan Saves; NJ cuGreenLoans	Combines low-cost capital offered by local lenders with larger capital pool offered collectively through network
Revolving Loan Funds	✓	✓	✓	✓	✓	Energize Connecticut "Payment Plan"	Uses ratepayer and other flexible funds directly as loan capital with flexible features that meet specific policy objectives
Clean Real Estate Investment Trusts (REITs)		✓		✓		Hannon Armstrong	Structured to lowers cost of capital by avoiding taxation at company level, while expanding capital pools to include small investors
Crowdfunding					✓	Mosaic (online network connecting solar investors with qualified projects)	Provides a platform to allow small investors to participate in solar loans
Energy Efficient Mortgages					✓	FHA; VA	Increases appraised value and borrowing capacity for EE work; uptake has historically been a challenge

While a number of these products have matured somewhat over the past several years, others have emerged more recently and have not been fully tested in the market. As a result, the mapping of these products onto particular markets may need to be refined over time.

Applying Financing Knowledge to the Strategic Plan

As important as it is to understand the general opportunities and challenges inherent to certain financing products, it will be equally important in the strategic planning process to apply knowledge of the New Jersey context when determining how financing may help promote program and policy objectives. The AEG team has a deep understanding of the New Jersey clean energy landscape, and in particular the ways in which financing is currently integrated into specific programs. Based on that knowledge and a broad perspective on the opportunities that financing presents, the AEG team would move toward expanding the role of financing in specific program areas where appropriate. The table below provides an overview of some of the strategic opportunities the team has identified in this regard.

Table 8: Program-Specific Financing Opportunities

	Current Activities	Opportunities to Expand Financing
Renewables		
SRECs	SREC Registration Program and related program financing options SRECs can also be combined with PSE&G solar loan.	Continue to support and encourage participation in SREC registration program, as well as program financing options, while encouraging participation in private financing options that are continuing to expand in the marketplace, including loans, leases, and power purchase agreements. Focus on developing packages that integrate EE and renewables.
REIP Incentives	No current financing component.	Begin by reviewing forthcoming evaluation results and stakeholder discussions prior to proposing any new financing options.
Residential EE		
Low Income	All measures installed free of charge. No financing component.	Challenging market to do anything substantial with financing.
HVAC	HVAC eligible for some financing options, including on-bill financing from New Jersey Natural and South Jersey Gas, but no products specifically tied only to stand-alone HVAC program.	Test a private-capital-driven, market-rate financing offer that would be available across the state and evaluate incremental net impact of financing, separate from any incentives. HVAC represents 80 – 90% of several of the highest-volume EE financing programs nationwide, including some offered w/o incentives. Some large programs offer rates and terms with little or no subsidization.
Existing Homes	HPwES currently offers various financing options, including cuGreenLoans, Energy Finance Solutions, and some on-bill repayment options.	Explore options for streamlining financing packages for all customers; consider tiered interest rates by project type and optimizing incentive/financing packages to reduce interest rate subsidy costs.

	Current Activities	Opportunities to Expand Financing
Residential New Construction	No current financing component.	Work with appraiser community to incorporate value of EE into appraised home value; explore establishing appraiser training and certification. Work with realtor community to incorporate EE labeling into multiple listing service (MLS). Work with Housing Mortgage Finance Agency to integrate EE components into affordable financing options.
EE Products	No current financing component.	Residential lighting not typically well suited to financing options at the retail level. Some appliances may be fit for simple "payment plan" options, for customers who are interested in financing.
C&I EE		
C&I New Construction - Prescriptive	No current financing component.	Focus on capturing the value of energy efficiency via labeling and disclosure initiatives, as well as working with the appraisal and commercial real estate communities.
C&I Retrofit - Prescriptive	No current financing component.	Access to capital may not be the largest barrier in the large C&I sector (though competing priorities may tie up internal capital). However, certain financing structures, when combined with other resources, may make projects more attractive to some customers. For prescriptive retrofits, these may include energy efficient leasing arrangements.
C&I New Construction – Pay for Performance	No current financing component.	Focus on capturing the value of energy efficiency via labeling and disclosure initiatives, as well as working with the appraisal and commercial real estate communities.
C&I Retrofit – Pay for Performance	No current financing component.	Access to capital may not be the largest barrier in the large C&I sector (though competing priorities may tie up internal capital). However, certain financing structures, when combined with other resources, may make projects more attractive to some customers. For comprehensive Pay for Performance projects, these may include commercial PACE, as well as ESA/MESA structures. Cost of capital may be improved by instituting standardized protocols throughout the project lifecycle (e.g., leveraging Investor Confidence Project work) and collecting both project and financial data.

	Current Activities	Opportunities to Expand Financing
Local Government Energy Audit	Audits and technical assistance. Because program pays 100% of the costs of such assistance there is no financing component.	Program currently focuses on audits only. ESIP allows entities to enter into long-term energy-savings performance contracts, with multiple financing options available (capital leases; refunding bonds). Possibly explore "owner's rep" role to standardize ESCO bids, review project scopes, negotiate contracts, and advise on project financing options.
Small Business Direct Install	No current financing component. Incentives up to 70% of costs.	Explore option of reducing incentive levels and offering financing options. Simple, streamlined loan and lease options, and/or on-bill loan repayment offers, most likely to be effective in this sector. Continue to combine financing with other resources in order to address multiple barriers faced by this segment.
Combined Heat and Power	Financing offered through Energy Resilience Bank (ERB) for eligible projects.	Streamline and optimize use of financing and incentives. Financing for CHP projects not eligible for ERB funding may be integrated into other large C&I financing solutions.
Large Energy Users Program	No current financing component.	Make eligible for other large C&I financing solutions.
SBC Credit	N/A	N/A

While the table above maps opportunities to the current portfolio of existing programs, some adjustments could potentially be made based on the changes to the portfolio of programs contained in the preliminary strategic plan outlined in the sections above. For example, in the residential sector, given the proposed integration of the stand-alone HVAC program with the Home Performance program, it may make sense to explore the integration of financing options for both types of projects. Even under an integrated scenario, however, it may be possible to establish different financing tiers within a single overall offering, a practice that has been well established among several states within the region.

For example, both the Keystone HELP program in Pennsylvania and the residential financing options in Connecticut's Energize CT programs offered tiered interest rates, with lower rates to encourage more comprehensive projects. In Connecticut's case, the capital sources have also varied "behind the scenes," with more flexible capital used for more comprehensive projects, though all products are branded with the customer-facing "Energize CT" label. Similarly, various options could be explored to leverage New Jersey ratepayer capital and attract private investment for more standardized projects, while more flexible options could be pursued for harder-to-reach projects, all while presenting a streamlined customer-facing financing experience.

Similarly, in the large C&I sector, the development of a C&I Customer-Tailored program, which would consolidate several existing programs (and more), would enable the consolidation of financing options as well. At the same time, as noted in the program descriptions above, certain tracks within the large C&I sector may receive special emphasis, and certain types of financing

may be best suited to these various tracks. For example, to the extent that public-sector buildings are included in the Account Management model for large C&I customers, the emphasis may be on advising on financing options that work best for this sector, such as performance contracting supported by lease-purchase agreements or refunding bonds.

In addition, new financing options may be explored that are specifically well tailored to the needs of the multifamily sector, corresponding with the proposed multifamily program. These options may vary for affordable and market-rate financing, which tend to face different barriers and circumstances. At the same time, options may be explored to address barriers that are persistent and common across the sector, such as split incentives. Financing options that may help address this barrier include on-bill financing with a pass-through to tenant utility bills, commercial PACE under common lease arrangements in which property taxes and assessments are passed onto tenants, and green leasing options, in which lease payments themselves are adjusted to account for shared savings by both owners and tenants.

Implementation Stages

In terms of timing, the AEG team envisions that certain financing options would be ready to pilot in the short term, given a demonstrated history of success in other locations. Other areas would be ripe for exploration over the medium term, as the issues to be dealt with are relatively clear and apparent, but the ideal solutions may take further discussion. Finally, certain areas may require exploration over the longer term, as the issues and questions may need to be fleshed out before solutions can be identified. Roughly speaking, the team expects that the following areas could be pursued according to this timeframe:

1. Areas to Pilot in the Short Term (within 1 year):
    a. **Residential HVAC standalone financing pilot:** We propose to leverage private capital to offer near-market rates and terms and require minimum efficiency standards for stand-alone residential HVAC units. This pilot may expand on current HPwES financing options or make use of alternatives. Standardized, turnkey products focused on using private capital to generate large volumes that attract secondary market investment (e.g., cuGreenloan; Warehouse for Energy Efficiency Loans; Kilowatt Technologies) may be well suited to this market segment. We will evaluate to determine the level of success in generating additional "net" savings above and beyond naturally occurring efficiency.
    b. **Low-to-moderate income home retrofit pilot (for those with incomes too high to be eligible for Comfort Partners Program) with alternative underwriting:** This pilot will most likely use on-bill financing with underwriting based on bill payment history (though off-bill options could be explored). In New York, alternative on-bill underwriting has been successfully used such that approximately one third of financing participants are low-to-moderate income customers, while similar underwriting in Connecticut has helped increase participation among income-challenged customers to reach as much as 40% of

total participation in certain financing products. There is also the potential to layer on credit enhancements to attract more flexible private capital. Effort should be devoted to tracking default rates (which have generally been very low for similar products) and other performance data, as well as success in expanding access to capital.

c. **Institute small business Direct Install financing:** This option will promote streamlined loan/leasing options with minimal burden on participants, potentially via expansion of existing small business on-bill options currently offered by some utilities into other service territories. Small business on-bill financing has helped other program administrators in the region reach significant percentages of this market segment. For example, the 0% Small Business Energy Advantage financing program in Connecticut, combined with up to 50% incentives, has reached nearly 30% of the market in some service territories.[19] A streamlined financing program may help stretch the use of ratepayer funds, which currently fund up to 70% of retrofit costs for New Jersey small businesses.

2. Areas to Explore over the Medium Term (1 – 2 years):

   a. Align Home Performance with enhanced financing options: Assess current products and determine how best to align, consolidate, and/or improve on available offerings to minimize confusion and provide a seamless customer experience.
   b. Pursue large C&I financing options: Explore both C-PACE and Energy Service Agreements (ESAs),[20] and institute standardized protocols (ICP) and data collection procedures on these projects.
   c. Explore potentially expanded role in MUSH sector: Consider facilitating ESCO projects by developing capacity to standardize documents, help review and negotiate bids, aggregate projects, and advise on financing options. Seek ways of incorporating these services into Account Management model proposed for large C&I customers, particularly in MUSH sector.
   d. Assess multifamily financing options: Determine most promising financing options that may help address the barrier of split incentives within multifamily properties, including on-bill financing, Commercial PACE, and green leasing.
   e. Integrate renewable and energy efficiency financing: Explore options such as bundling solar with efficiency measures, combining solar and heat pump leasing, and other products to encourage joint promotion of EE and renewable measures.

[19] Zimring, Mark, et al., "Financing Energy Improvements on Utility Bills: Market Updates and Key Program Design Considerations for Policymakers and Administrators," State and Local Energy Efficiency Action Network, May 2014, p. 20, https://www4.eere.energy.gov/seeaction/system/files/documents/onbill_financing.pdf.

[20] For example see: http://metrusenergy.com/what-we-do/financial-solutions/ and/or http://scienergy.com/products/mesa/.

3. Areas to Explore over the Longer Term (2 – 4 years):
    a. Promote building labeling and disclosure efforts: Advance these efforts in both the residential and commercial sectors, and work with the appraiser and realtor communities to capture the value of efficiency in building transactions.
    b. Explore additional financing enhancements: Consider expanding guaranteed or shared savings arrangements to additional market sectors, and explore insurance options.

Standardization and Data

As part of its overall efforts to promote financing across various sectors of the energy efficiency and clean energy portfolio, the AEG team would integrate deliberate practices aimed at improving the flow of information to investors regarding project-related performance risk and sending signals that help build confidence within the investor community. These efforts may take different forms in different sectors, and would be balanced with the need to offer financing products that are flexible enough to meet a wide range of policy objectives. In the large C&I sector, the team would explore the possibility of leveraging the work of the Investor Confidence Project (ICP), which has developed standard protocols for all stages of a project lifecycle based on industry best practices. ICP protocols for smaller businesses, direct install projects, and multifamily projects would be vetted and integrated where appropriate, as well.

In other sectors, such as single-family residential projects, certain turnkey financing products (e.g., the Warehouse for Energy Efficiency Loans or WHEEL) are designed to engender investor confidence via standard underwriting, quality assurance, and measure and contractor eligibility requirements. The intent is to develop predictable performance data correlating with these standardized features, upon which investors could then rely. The potential long-term advantages that these products offer in terms of long-term investor confidence should be weighed against potentially higher costs in the shorter term, as well as reduced flexibility in terms of rates, terms, and other features that may meet specific policy objectives. One option to consider may be to implement this type of product for projects that themselves may not need as flexible or low-cost financing, such as HVAC replacement, while implementing more flexible options for project types or market segments that are more difficult to reach.

Regardless of the products and protocols that are implemented, the AEG team would collect both project and financial performance data in a rigorous way designed to meet the needs of investors and other stakeholders. This data collection process would leverage important work on this topic underway via the Lawrence Berkeley National Lab, in which key members of the AEG team are directly engaged.[21]

[21] See, e.g., Thompson, Peter J., Peter H. Larsen, Chris Kramer, and Charles A. Goldman, "Energy Efficiency Finance Programs: Use-case Analysis to Define Data Needs and Guidelines," State and Local Energy Efficiency Action Network (SEE Action) Financing Solutions Working Group, July 2014, https://www4.eere.energy.gov/seeaction/system/files/documents/finance_progams.pdf.

Evaluation

Ultimately, the success of efforts to expand the use of financing within the energy efficiency and clean energy portfolios will depend on the results actually produced. In some cases, those results may not be immediately obvious, given the context in which program financing options are typically offered. In particular, the degree of net savings that financing has produced on top of naturally occurring energy efficiency may require an examination of 1) whether the program financing produced a decision to move forward or increased the efficiency of a project, 2) whether alternative private financing would have produced the same project, and 3) in some cases, where incentives are present, the relative influence of financing and incentives. All three of these questions are important to answer in order to determine the level of additional energy savings that program financing has produced in its own right on top of naturally occurring efficiency, while the last question is especially important when there is an effort to calibrate financing and incentives to optimize the use of ratepayer funds.

Various jurisdictions are increasingly recognizing the importance of evaluating these questions, and a number have begun to conduct financing-specific evaluations to help answer them. The list of jurisdictions that have conducted financing evaluations of one sort or another now includes at least Maine, Massachusetts, Maryland, Illinois, Michigan, and California. New York has developed an evaluation plan for its Green Bank, and the Connecticut Green Bank has just recently hired an evaluation team to develop a plan, as well. These evaluations are becoming increasingly sophisticated in terms of the questions they are asking and the methods they are using to derive answers. The AEG team is well positioned to leverage best practices that are beginning to emerge from these efforts, with key team members serving on the California evaluation team, leading a national research effort on this topic via Lawrence National Berkeley Lab and organizing evaluation panels of leading national efficiency financing conferences.

As financing both expands and matures in its role as a key element of the energy efficiency and clean energy portfolio, robust evaluation will help fine-tune the understanding of the AEG team and all stakeholders as to how this tool can be deployed most effectively. Armed with this understanding, the team will be best positioned to incorporate this tool into its overall efforts in order to ensure the greatest degree of success.

5.1.5 Alternative Sources of Funding for NJCEP Programs

Our team has extensive experience and expertise in all three of the areas discussed below and is prepared to help the BPU shape policy as needed to best leverage these potential sources of funding. We believe that a key priority of the new strategic plan should be to put in place as quickly as possible whatever policy, program and/or other changes are needed to enable the state to access those resources.

PJM Capacity Market Revenues

Beyond rate-payer funds and private sector capital, there may be other potential sources of revenue that could be cost-effectively accessed to support NJCEP programs in the future. The first and most readily accessible of these is the PJM capacity market (known as its Reliability

Pricing Model or RPM). The AEG team is fully prepared to assist the state in accessing any such revenues.

PJM holds two different kinds of auctions for capacity:

- a base residual auction for capacity that will be available three years in the future, and
- incremental auctions that are held each year and, to date, have been used primarily to allow bilateral capacity sales between entities that have already made capacity obligations through previous base residential auctions (but may be short of what they thought they would have) and other parties that have not yet had committed their capacity resources.

Energy efficiency resources have been allowed to bid into these auctions for the past four years. A pre-condition for bidding efficiency resources is the development of a plan for acquiring and documenting the efficiency resources that will be bid into the market. A critically important element of that plan is a Measurement and Verification plan. Such plans need to be submitted to (at least 30 days before an auction) and ultimately approved by PJM.

The clearing price for the 2017/2018 base residential auction was $215 per MW-day (about $78 per kW-year) in PSE&G's service territory and $120 per MW-day (about $44 per kW-year) in the rest of the state. In 2014, the NJCEP efficiency programs created approximately 80 MW of new capacity savings. If that level of savings were to be assumed to continue each year into the future, approximately 320 MW of savings could potentially be bid into the market each year (PJM only allows claiming of efficiency savings for four years, regardless of whether the measure lives are longer). At the 2017/2018 base residential auction clearing prices, that would translate to annual payments of approximately $20 million.[22] If savings were to increase in the future, as our preliminary strategic plan suggests is possible, capacity market revenues would also increase.

Some of the peak demand savings currently being generated by NJCEP efficiency programs are already being bid into the market by aggregators that have negotiated the right to do so on behalf of some NJCEP program participants (typically large C&I customers which provide large enough savings to justify the effort required to strike such deals). However, limited available evidence suggests that the portion of NJCEP peak demand savings being bid into the market is quite modest (probably less than 10%).[23] That in turn suggests that a significant portion of potential revenue is currently going untapped.

[22] There has been some uncertainty created by FERC order 745 which was overturned and is now before the US Supreme Court. This would limit ISO use of "behind the meter" resources for energy market participation. However, this is being contested and any impact on capacity markets could be years out.

[23] As noted earlier, approximately 320 MW of peak savings from NJCEP efficiency programs could be bid into the market each year. PSE&G accounts for roughly 60% of all electricity sales in the state. If NJCEP peak savings were proportional to retail electric sales, then a little less than 200 MW of peak savings from NJCEP programs

It should be noted that although there is important revenue potential from bidding the capacity savings from efficiency resources into the market, there is a cost to participating in the market. In particular, there are administrative costs associated with developing bids, participating in the bidding process, tracking and reporting to meet PJM requirements, etc. There are potentially non-trivial M&V costs – some of which may already be planned for the NJCEP programs, but some of which may not be. Those additional costs would need to be covered in some fashion. However, experience from other jurisdictions suggests that the capacity market revenue would be much greater than the cost of acquiring it, with the net impact being either a significant defraying of the NJCEP portfolio costs or additional funds to acquire additional savings.

There are contractual and policy issues that would need to be addressed. For example, the state would need to determine whether it wanted to assume ownership of all peak savings the NJCEP programs produce or only those from customers not already participating in the market through aggregators. There is certainly the potential that some NJCEP program participants, particularly large C&I customers, may prefer selling their capacity savings to taking a program rebate. While such requirements have not had noticeable impacts on program participation in other states, we know that some larger New Jersey customers have suggested that it could affect their decisions on NJCEP participation. This is clearly an issue that deserves further exploration, particularly in the context of a transition from rebates to financing. In any case, the Program Administrator would need to be able to document ownership of whatever savings it intended to bid. In other jurisdictions this is accomplished by making any financial incentives (including direct rebates) conditional on ceding ownership rights to the capacity savings. The AEG team believes this is an eminently reasonable approach.

Just as important is the issue of the state's contract with the next Program Administrator. Because base residual auctions take place three years before savings must be delivered, several years into its contract the Program Administrator would be asked to bid efficiency resources which it may not even be around to deliver (if the state chose to change the Program Administrator). In addition, even for the years in which the Program Administrator knows it will be under contract, there are risks associated with bidding future savings associated with potential changes in program budgets, program designs, and other factors over which it would not have control.

The AEG team is familiar with how these types of risks have been successfully addressed in other jurisdictions and is prepared to work with the OCE to adapt those solutions to the New Jersey context. That could include a sharing of the capacity market revenues as a way of covering the costs of participating in the market.

would be available to bid into the PJM capacity market from PSE&G's service territory each year. Data published by PJM suggests that only 18 MW of efficiency resources cleared the market in PSE&G's service territory in the most recent auction. Moreover, a portion of that total is likely to have come from PSE&G's bidding of peak savings from its own programs (which produce savings over and above those produced by NJCEP).

EPA Clean Power Plan

In June of 2014 the U.S. Environmental Protection Agency (EPA) released a set of draft regulations of carbon dioxide emissions from existing electric utility power plants. The regulations were intended to reduce national emissions from the sector by 30% (relative to 2005 levels) by 2030. Each state was given an emission reduction target. The state targets were based on EPA's assessment of the potential in each state for deployment of four different "building blocks": (1) increasing the efficiency (i.e. heat rates) of existing fossil fuel-fired power plants; (2) running higher emitting power plants less often and lower emitting power plants more often (or fuel-switching from coal to gas); (3) building more zero-emitting generation – i.e. renewables and/or nuclear; and (4) increasing energy efficiency.

In the case of energy efficiency, each state is assumed to be able to achieve 1.5% incremental annual electricity savings – or nearly three times what New Jersey actually achieved in 2013.[24] That would ultimately account for a little more than 21% of the state's emission reduction requirement. Though the target for each state was built up using a common set of assumptions about how much each of those four building blocks could produce, the regulation would allow states to choose any mix of those building blocks and/or to include additional strategies of their choosing. A final rule is expected to be released in June 2015, with state plans for how they will comply due in June 2016 (though there are options for one or two year extensions).

This regulation will clearly assign substantial new value to electric energy savings from efficiency programs and renewable electricity generation because any emission reductions not achieved through those strategies will need to be achieved in other – often much more expensive – ways. The form in which the value materializes will depend, in large part, on how New Jersey chooses to comply with the regulations. At the highest level, the state will need to choose between what is called the "mass-based" and "rate-based" approaches to regulating its emissions. Under the mass-based approach, the state agrees to an absolute cap on its emissions. In that context, NJCEP programs would indirectly provide value by reducing demand for carbon emission generating facilities. Under the rate-based approach, states agree to a carbon emission rate per unit of electricity consumed, with savings generated from new efficiency and new distributed renewable generation effectively serving as a credit towards the rate. In that context, NJCEP programs provide direct value by mathematically lowering the state's calculated emission rate.

Most other states in the Northeast are expected to use a mass-based approach in which emission permits are auctioned and at least a portion of the revenues are invested in energy efficiency and/or other clean energy infrastructure. If New Jersey were to go that route, the revenues from its emission allowance auctions could potentially supplant and/or augment the existing SBC-funding mechanism for the NJCEP programs. Alternatively, if New Jersey chooses the rate-based approach, the utilities could be obligated to fund NJCEP programs as a least cost path to compliance with the regulations (rather than as a system benefit charge). Either way, it appears

[24] Gilleo, Annie et al., *The 2014 State Energy Efficiency Scorecard*, ACEEE Report U1408, October 2014.

as if the value of energy efficiency and renewable energy as a Clean Power Plan compliance options will be enormous, probably substantially greater than current NJCEP funding levels. The AEG team has considerable experience and expertise in various states with analysis and support for the development of policies to comply with the forthcoming regulations. We are prepared to work with the BPU and other state officials, as appropriate, to inform policy deliberations regarding the role NJCEP programs could or should play.

Efficiency as a T&D Resource

A growing number of jurisdictions across the country – particularly in New England and New York – have begun to use geographically-targeted energy efficiency and other demand resources (including distributed generation) to cost-effectively defer new investments in transmission and distribution (T&D) system infrastructure.[25] Not all T&D investments are deferrable. For example, investments required to replace aging or ineffective equipment have to be made regardless of load levels. However, a significant portion of T&D investment is related to load localized growth, which can occur even if system-wide electricity sales are flat.

In such cases, forecast investments can often be cost-effectively deferred – or even eliminated altogether – through geographically-concentrated investments in efficiency and/or other demand resources. Con Edison in New York has been doing so for more than ten years. During that time it has initiated geographically-targeted efficiency projects in more than one-third of its network areas. Those investments have produced roughly three dollars in benefits to ratepayers for every dollar of utility expenditure. Con Ed recently proposed the most ambitious project of its kind to date: a $200 million project to defer the need for system reinforcements in Brooklyn and Queens. The project calls for 41 MW in demand side solutions plus 11 MW of capacity savings through "non-traditional utility side solutions".[26] It may be worth noting that PSEG Long Island recently submitted a proposal to the Long Island Power Authority to defer substantial transmission upgrades, in part through an RFP to procure efficiency and/or other forms of demand-side load relief.[27]

This kind of approach to minimizing T&D costs imposed on ratepayers could be deployed in New Jersey. To be sure, there will be some regulatory (and perhaps other) policy hurdles to overcome. However, if they are addressed, such an approach could provide a new funding source for at least some NJCEP programs. For example, discretionary retrofit programs such as the new Home Retrofits, C&I Direct Install and the new proposed C&I Customer-Tailored program could be target marketed to specific zip codes of interest and receive payments from the utilities when they achieve savings in those areas. We have worked extensively in this area and are prepared to assist the BPU on the team's behalf in both addressing policies issues related to the use of efficiency as a T&D resource and to assist the team in deploying a targeted programs.

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[25] Neme, Chris and Jim Grevatt (Energy Futures Group), *Energy Efficiency as a T&D Resource: Lessons Learned from Recent U.S. Efforts to Geographically Targeted Efficiency Programs to Defer T&D Investments*, published by Northeast Energy Efficiency Partnerships, January 9, 2015.
[26] Ibid.
[27] Ibid.

5.2 FY16 Comprehensive Strategic Planning Process

5.2.1 Proposed Process

Beginning in FY16, we propose to launch a comprehensive strategic planning process after this contract is awarded. The goal of the process would be to systemically vet the ideas put forward in our preliminary strategic plan and revise or refine that plan as appropriate. The result would be a long-term plan, built from the bottom up, that includes proposed funding levels and associated savings that could be used as the basis for the Board's consideration of a multi-year CRA.

As noted above, our proposed process for revising or refining the preliminary plan during FY16 is consistent with the following five steps (with evaluation being a core component of the process) initially discussed during the NJ Clean Energy Leadership Team kick-off meeting in November 2014:

1. Set high level objectives
2. Establish clear policy guidance related to those objectives
3. Conduct baseline and efficiency/renewables potential studies
4. Establish specific goals informed by those studies
5. Plan programs to achieve those goals

We briefly discuss each of these below.

Set High Level Objectives

The strategic plan for the NJCEP portfolio must be driven by the State's policy objectives. In many states, those objectives start with specific savings goals for energy efficiency (Energy Efficiency Resource Standards, or EERS) and generation targets for renewables (Renewable Portfolio Standards, or RPS). New Jersey has the latter, but not the former. The 2011 Energy Master Plan makes clear that the state wants to "drive down the cost of energy for all customers" and "reward energy efficiency and energy conservation and reduce peak demand". It makes clear a desire to improve the efficiency of state buildings, adopt aggressive building codes and redesign the states efficiency programs. However, more specifics are required to inform a strategic plan.

Thus, we propose that the first step in the strategic planning process be a series of meetings, held in relatively rapid succession, to work with the OCE and other important stakeholders to develop key objectives. Ideally, the first such objective will be an articulation of both medium term (e.g. 4 to 5 year) and longer term (e.g. 10 year) energy efficiency savings targets (even if only approximate and subject to the cost-effectiveness concerns articulated in the Energy Master Plan. However, other objectives will also be explored. The AEG team will bring a wealth of experience and ideas to these meetings from our work on such issues in other jurisdictions.

Establish Clear Policy Guidance Related to Objectives

Not only would it be ideal to have at least an initial energy savings goal, but it would be helpful to have direction regarding how to balance trade-offs between long-term market transformation

and shorter-term resource acquisition, between energy savings and peak demand savings and between equity in customer access to programs and cost minimization. All of those trade-offs have implications for the budget it will take to achieve savings goals. It will be important to address such questions as whether there should be any changes to historic practices regarding whether goals are to be articulated in gross or net terms, whether deemed savings will continued to be used for prescriptive measures, what protocols will be used to estimate savings from custom measures, how much flexibility the program administrator will be given to modify program designs (including rebate levels and budgets) without pre-approval, and a variety of other topics.

Addressing these issues will require a series of meetings and discussions with the OCE and stakeholders. Those discussions could either follow or – to some degree – be integrated with the bigger picture discussions of over-arching objectives.

It may also be important at this stage of the process to explore some other complementary policies that might be helpful for addressing the state's objectives. There should be a planned, symbiotic relationship between NJCEP programs and other state policies. In some cases, new policies might be better vehicles for achieving goals than NJCEP programs, thereby enabling a more strategic focusing of NJCEP efforts and funding. In other cases, NJCEP efforts may be essential to enabling or accelerating the adoption of a new policy. While we appreciate that the next Program Administrator will not control policy decisions, we believe that understanding potential trade-offs between new policies and NJCEP portfolio directions will enable the state to make better decisions on those directions. An initial list of such potentially complimentary policies is discussed below.

Conduct Market Research

Market research is needed to improve our understanding of the different markets for cost-effective efficiency investments. That includes assessing the magnitude of savings potential, the degree to which that is changing or likely to change over time (i.e. naturally shifting baselines), the nature and severity of barriers to consumer investment in those markets – by market segment or sub-segment, consumer interests which could be better leveraged to overcome those barriers, and a variety of related topics.

State-wide studies, such as the soon-to-be-launched statewide New Jersey baseline study, are often useful first steps in such market research efforts, providing high-level insight needed to set future portfolio-level savings goals and budget. However, such studies often do not shed much light on important differences between baseline conditions, market barriers and market opportunities in different market sub-segments. To be effective, efficiency program strategies need to be informed by the greatest possible understanding of the opportunities, interests, needs and challenges faced by the many different types of customers (large vs. small, renters vs. owners, multifamily vs. single-family, commercial vs. industrial, retail spaces vs. offices, etc.). Thus, great value can be gained from supplementing statewide baseline studies (and related potential studies) with more granular and more targeted market research. Such market research

can take the form of mini-studies field studies, customer surveys, customer focus groups, or a variety of other designs.

The AEG team believes that there would be much to be gained by making the program administrators that are charged with designing and delivering programs responsible for such market research. Unlike impact evaluation work, which need to be conducted independently because program administrators have a vested interest in the outcomes, market research whose purpose is solely to inform future program design might best be designed and carried out by the entity that will ultimately use it. Moreover, because program administrators are constantly receiving market feedback in real time – both in the form of anecdotal information from consumers and trade allies and in the form of program demand or participation – they are best positioned to know what new information is needed to inform mid-course corrections, when it is needed, and from whom it is needed. They also have the capability to deploy research efforts quickly, which is often necessary to address markets that are themselves changing very quickly and enable more nimble adjustments in strategy.

Establish Specific Goals

After the conclusion of the baseline and potential studies, as well as other more granular market research efforts, it will be important to establish more specific savings goals and budgets – informed by the studies, experience in other jurisdictions and other relevant data. This will certainly require significant additional engagement between the Program Administrator and the OCE and other stakeholders. It will likely benefit from the development of several scenarios to enable intentional decisions regarding some key trade-offs.

Plan Programs to Achieve Goals

This last step in the process (before implementation) will require considerable effort, taking the initial work of the preliminary strategic plan outlined above to additional levels of detail. As with the other steps in the process, this will likely require several iterations of analysis, drafting goals and budgets, and discussing drafts with the OCE and other stakeholders.

We would also suggest that all programs should have "logic models" that lay out the relationships between program strategies and market barriers associated with different market actors, that identify key primary and secondary indicators of market changes (e.g. awareness levels, training levels, market shares for key products, etc.) that should be tracked over time, that forecast how those indicators will change over time, and that suggest when it will be appropriate to transition to either promotion of more aggressive levels of efficiency or out of a market altogether.

5.2.2 Consideration of Complementary Clean Energy Policies

A variety of other policies could have potentially important impacts on the short and long-term effectiveness of the NJCEP programs. The AEG team understands that the next NJCEP Program Administrator will not control policy decisions. Depending on the issue, those decisions will be made by the Governor's office, the legislature, the BPU and/or other government agencies.

However, we believe it is important to consider the future direction of the NJCEP programs in a broader policy context. Thus, while we would expect to devote the vast majority of our strategic planning efforts to assessing the NJCEP programs, we propose to invest some effort in helping identify other policies that could be pursued by the state to achieve its goals.

In some cases, this could lead to identification of policy changes that are solely within the purview of the BPU and could be relatively easily and quickly adopted, with important and quick "returns". In other cases, potential policy changes would be more complex, more political, involve a broader range of government actors and, as a result, would not get adopted for several years – if ever. Further, some new policies might never get adopted without the benefit of the kind of voluntary market development that could be pursued under the NJCEP programs. For example, at both the state and federal level, rate-payer funded efficiency programs have often been credited with pushing the envelope on new levels of efficiency for products or new construction practices to the point where there is enough market adoption and resulting "proof of concept" that regulators feel comfortable adopting new codes or standards. We believe a strategic planning process should endeavor to think in those kinds of strategic terms.

Select examples of policies that might be considered in a strategic plan include:

- **Building efficiency labeling and disclosure requirements**. The number of jurisdictions in the U.S. that have adopted requirements for commercial buildings, particularly large buildings, to assess their efficiency and disclose it (particularly to potential renters) is growing. Though not fully evaluated, there appears to be at least anecdotal evidence that such requirements are leading to both efficiency investments and related job growth. Similar requirements for disclosing the efficiency of residential homes that are being sold have been shown in Europe and Australia to lead to changes in housing prices, suggesting the market has begun to value efficient homes more highly than inefficient alternatives – the kind of market signal that should lead to greater "natural" investment in efficiency. Anecdotal information from Austin, Texas suggests that such efficiency investments are indeed occurring. While not a panacea, this suggests that a building efficiency labeling and disclosure requirement at time of sale or lease could play an important role in driving demand for NJCEP programs, either increasing participation in those programs or enabling them to reduce costs or both.

- **Rental energy codes**. Several jurisdictions across the U.S. – including Burlington, Vermont; Memphis, Tennessee; Boulder, Colorado; and Berkeley, California – have adopted minimum efficiency standards for residential rental properties to address the "split incentives" barrier to efficiency investments in that sector. The Boulder program has some particularly interesting features and documentable early success in achieving significant efficiency improvements.

- **"Stretch codes" for new construction**. With support from the utility administered efficiency programs, dozens of Massachusetts municipalities have voluntarily adopted

more stringent building codes for the efficiency of new homes. The Long Island Power Authority has successfully pursued similar efforts with municipalities in its service territory.

- **Providing the Program Administrator access to historic customer utility usage data.** As discussed above, access to such data could provide substantial benefits. For example, experience in Vermont – where Efficiency Vermont has access to and maintains a database of customer data – suggests such access enables more effective call center responses to customer inquiries, more effective target marketing of different programs, and better ability to develop partnerships with larger customers. Moreover, there are new innovations in the market that could help efficiency programs both cut costs and increase savings by enabling detailed assessments of efficiency potential. There are certainly customer privacy and confidentiality issues that would have to be addressed. However, the Vermont experience – with not one single customer complaint in more than 15 years – suggests they can be managed.

5.2.3 Summary

The strategic planning process and the additional policy considerations outlined above are critically important and potentially even somewhat controversial (at least parts of them). Thus, both will need to be vetted with the BPU and other stakeholders. Thus, if selected by the BPU, the AEG Team expects to work closely with staff, Commissioners and other parties (as directed) to both refine the comprehensive strategic planning process, hone in on the key policy issues and options to be considered and to ultimately manage a process that meets the objectives of the state, including increasing savings; increasing clean energy-related jobs in the state; and reducing dependence on SBC funding by leveraging financing, enhancing marketing and outreach, and potentially drawing on other non-SBC sources of funding.