STATE OF SOUTH CAROLINA

BEFORE THE PUBLIC SERVICE COMMISSION

DOCKET NO. 2016-223-E

In the Matter of:
Petition of South Carolina Electric & Gas Company for Updates and Revisions to Schedules Related to the Construction of a Nuclear Base Load Generation Facility at Jenkinsville, South Carolina

Direct Testimony of Alice Napoleon on Behalf of the South Carolina Coastal Conservation League

September 1, 2016
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EXHIBIT A: RESUME

EXHIBIT B: REPORT
1. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name, title, and employer.
A. My name is Alice Napoleon. I am a Senior Associate at Synapse Energy Economics (“Synapse”), located at 485 Massachusetts Avenue, Cambridge, MA 02139.

Q. Please describe Synapse Energy Economics.
A. Synapse is a research and consulting firm specializing in electricity and gas industry regulation, planning, and analysis. Our work covers a range of issues including integrated resource planning; economic and technical assessments of energy resources; electricity market modeling and assessment; energy efficiency policies and programs; renewable resource technologies and policies; and climate change strategies. Synapse works for a wide range of clients including attorneys general, offices of consumer advocates, public utility commissions, environmental groups, and federal clients such as the U.S. Environmental Protection Agency and the Department of Justice. Synapse has a professional staff of 30 with extensive experience in the electricity industry.

Q. Please summarize your professional and educational experience.
A. Since joining Synapse in 2005, I have provided economic and policy analysis of electric systems and emissions regulations, with a focus on energy efficiency policies and programs, on behalf of a diverse set of clients throughout the United States and in Canada.

Before joining Synapse, I worked at Resource Insight, Inc., where I supported investigations of electric, gas, steam, and water resource issues, primarily in the context of reviews by state utility regulatory commissions.
I hold a Master’s in Public Administration from the University of Massachusetts at Amherst and a BA in Economics from Rutgers University. My resume is attached as Exhibit A.

Q. Please describe your professional experience as it relates to energy efficiency policies and programs.

A. Energy efficiency policies and programs have been a central focus of my professional career. Since joining Synapse, I have reviewed, analyzed, and critiqued energy efficiency policies and programs in over a dozen U.S. states. In Colorado, Maryland, and South Carolina, I facilitated and provided expert analysis for demand-side resource policy working groups, where energy efficiency policies and programs were discussed and negotiated as possible state actions to reduce greenhouse gas emissions. On the national level, I provided guidance on program design, developed communications materials, and directed the development of case studies to help state and utility energy efficiency program administrators with implementing offerings to support participation in the U.S. Department of Energy’s Superior Energy Performance program.

Since 2009, I have provided extensive and ongoing expert analysis and support for the State of New Jersey regarding its state- and utility-administered residential, low income, commercial, and industrial energy efficiency and combined heat and power programs. To this end, I regularly review, analyze, and comment on the state-administered programs’ monthly performance, designs and budgets, cost-benefit analyses, and overall administrative structure. In over a dozen dockets regarding utility-administered efficiency programs, I conducted expert analysis, provided litigation support, and drafted testimony when
appropriate on behalf of the State with respect to energy efficiency implementation, cost recovery, program budgets, performance, evaluation, cost-benefit analysis, and overlap between utility- and state-administered programs.

My work has encompassed many aspects of energy efficiency program design and implementation, including efficiency measure screening, program delivery options, program budgeting, cost-benefit analyses, avoided costs, and other relevant regulatory policies.

Q. On whose behalf are you providing testimony in this case?
A. I am providing testimony on behalf of the Coastal Conservation League (“CCL”).

Q. What is South Carolina Electric & Gas Company seeking in this case?
A. South Carolina Electric and Gas Company (“SCE&G”) has filed a petition asking the Public Service Commission of South Carolina to approve an approximately $852 million increase in the cost estimate for the construction of two new units at the V.C. Summer nuclear power plant. Already, SCE&G has raised rates eight times over the past seven years to recover the financing costs of the plant, and SCE&G has just filed for approval in Docket No. 2016-224-E to increase rates by another three percent to recover the costs of recent construction.1 These repeated rate increases have had a substantial impact on customer bills, with financing costs for the plant currently accounting for over 16 percent of the average residential customer’s bill.2 If the most recent rate increase is approved, the

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average monthly residential electric bill will have increased from $114.20 at the start of 2009 to $148.11—a 30 percent increase.\(^3\)

**Q. What did CCL retain Synapse to do in this case?**

**A.** CCL retained Synapse to develop proposals to mitigate the bill increases related to the new V.C. Summer units through energy efficiency programs, a proven strategy for helping customers to reduce their electricity bills. CCL also asked Synapse to estimate the rate and bill impacts of an expanded energy efficiency scenario.

**Q. What is the purpose of your testimony?**

**A.** The purpose of this testimony is to describe and present the results of Synapse’s review and recommendations. I describe Synapse’s review of SCE&G’s energy efficiency efforts to date; our development of an alternative scenario with higher levels of energy efficiency; our examination of ways to overcome market barriers to efficiency; and our analysis of the rate and bill impacts of the expanded energy efficiency scenario. Finally, I make a number of recommendations aimed at expanding SCE&G’s energy efficiency programs to allow all customers the opportunity to lower their bills.

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3 Office of Regulatory Staff web site, available at http://www.regulatoyrstaff.sc.gov/Documents/News%20Archives/6-28-16%20SCEG%20Revised%20Rates%20Filing.pdf (“Under SCE&G’s proposed increase, residential customers served on Rate 8 (the most common residential rate) using 1,000 kWh would pay an average of $148.11 per month. This is an increase of $4.44 from the current average bill of $143.67. Of the $148.11, $27.61 or 18.64% of the bill is attributable to the construction of the Units.”).
Q. How is this testimony organized?
A. This testimony is organized as follows:

1. Introduction and Qualifications
2. Summary of Conclusions and Recommendations
3. The importance of utility-sponsored efficiency programs
4. Review of performance of SCE&G’s energy efficiency programs
5. Expansion of SCE&G’s energy efficiency portfolio
6. Rate and bill impacts of expanded energy efficiency
7. Conclusions and Recommendations.

2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your primary findings.
A. Consistent with the findings of Synapse’s report on SCE&G’s energy efficiency portfolio and future opportunities (the report), attached as Exhibit B, I make the following findings:

- Ramping up SCE&G’s energy efficiency programs to a moderate level of residential energy savings attainment equivalent to 1.5 percent of residential retail electricity sales (the Alternative Case) would likely reduce average customer bills by 1.6 percent across all ratepayers. All (or the vast majority of) customers would have the opportunity to participate in SCE&G’s programs in this scenario.

- A lower level of energy efficiency investment, consistent with the savings level assumed by SCE&G in its 2016 IRP (the Base Case), would result in average ratepayer benefits of negative 0.5 percent across all ratepayers. The
level of funding for the Base Case will not be large enough to serve all residential customers for many years.

- The performance of SCE&G’s existing energy efficiency portfolio has dwindled. By the second program year, the initial portfolio of programs had ramped up to achieve 110.6 GWh of annual incremental savings or 0.52 percent of total retail sales. Since that time, performance has faltered and declined. In Program Year 5, the entire portfolio achieved only 81.3 GWh, equivalent to 0.36 percent of total retail sales. The residential energy efficiency programs saw an even steeper decline. In Program Year 2, residential program savings amounted to 83.8 GWh, or 1.11 percent of residential retail sales. By Program Year 5, residential program savings declined to just 42.7 GWh, or 0.5 percent of residential sales, about half of the savings level in program year 2. SCE&G projects further declines in Program Year 6 to 73.7 GWh savings for the entire portfolio, and 28.1 GWh savings from the residential programs.

- There are ample opportunities for SCE&G to ramp up its energy efficiency programs. Just a few of the ways SCE&G can do so are as follows:
  - Expanding or modifying existing programs—for example, by increasing marketing and advertising budgets to bump up participation, changing the delivery approach of the lighting program, and modifying the design of the low-income program to address all cost-effective opportunities including additional low cost, cost-effective measures and deep energy savings measures such as insulation;
O reinstating core efficiency programs, including the ENERGY STAR New Homes and Home Performance with ENERGY STAR programs;

O providing incentives for high-efficiency manufactured housing;

O studying or piloting additional offerings for commercial and industrial customers; and

O offering low- or no-cost financing through existing programs, to improve the ability of hard-to-reach customers—low income customers in particular—to participate in the programs.

- A range of market barriers that impede the ability of customers to implement energy efficiency on their own persist for all or almost all customers. Regulatory policies are necessary to overcome these market barriers, and energy efficiency programs can play a vital role to overcome the barriers.

Q. Please summarize your primary recommendations.

A. I recommend that SCE&G ramp up its energy efficiency programs and expand its portfolio, using some or all of the enhancements discussed in Exhibit B. In particular, I recommend that SCE&G:

- Investigate and report on potential options for offering on-bill financing, the Pay-As-You-Save (PAYS) program, or another financing mechanism;

- Increase marketing and advertising budgets, consistent with marketing expenditures as a percent of total program budget seen in leading states, in order to bump up participation;
• Conduct evaluation studies to support changes to existing programs—such studies should include assessment of the extent of the leakage for the lighting program, NEEP participation, and whether to include other cost-effective measures through NEEP;

• Reinstate core efficiency programs, including the ENERGY STAR New Homes and Home Performance with ENERGY STAR programs;

• Investigate implementing new programs, such as one focused on promoting high-efficiency manufactured housing, and additional offerings for commercial and industrial customers; and

• Develop program designs that maximize participation, to facilitate all customers taking part in energy efficiency programs and experiencing bill reduction benefits.

3. THE IMPORTANCE OF UTILITY-SPONSORED EFFICIENCY PROGRAMS

Q. Why should a utility offer energy efficiency programs?
A. Energy efficiency yields substantial benefits to utilities and their customers by lowering electricity costs and customers’ bills, reducing financial and power supply risks, reducing the costs and risks of complying with current and future environmental regulations, and other benefits. However, energy consumers face market barriers to implementing energy efficiency measures on their own. For example, energy consumers may lack the up-front capital for an energy efficiency product, may be unaware of the full range of energy efficiency options, or might be unable to invest the time and effort required to make an informed purchase and
install energy efficiency measures. Regulatory policies and programs are
necessary to overcome these market barriers. Energy efficiency programs have a
critical role to play in overcoming the barriers, both to ensure that energy savings
are achieved in the short to medium term and to promote the transformation of the
efficiency market over the long term.

Q. Please describe some policies and programs to address market barriers.
A. Rebates and financing can reduce or eliminate the up-front financial burden on
participants who lack access to capital, a market barrier commonly faced by low-
income customers. Loan repayments can be structured so that energy efficiency
program participants do not experience bill increases relative to the period before
participation (i.e., Pay As You Save programs). On-bill financing makes loan
repayment easier for participants by combining it with payment of the utility bill,
in addition to minimizing participants’ up-front capital needs.

Program administrators also commonly address a different market
barrier—lack of information—with customer outreach and education efforts
through a variety of media. Examples include advertisements, bill inserts,
presence at community events, and point-of-purchase displays with information
on expected energy performance improvements.

In Exhibit B, these market barriers and others are described in more detail,
as well as approaches that energy efficiency program administrators and
policymakers commonly use to address them.
Q. Are there other reasons why energy efficiency programs are important?
A. Yes. Energy efficiency programs are necessary to reach all market and customer types. Market forces alone will focus on the lowest-cost efficiency savings and thus tend to result in significant lost opportunities for higher-cost, but still cost-effective energy efficiency improvements. Because of the higher cost, market mechanisms tend to ignore hard-to-reach groups such as low-income, multi-family residential, and small business customers. Low-income customers in particular are an important customer sector to reach, as they typically contribute a very high portion of their disposable income toward their energy bills, can experience significant benefits from adopting energy efficiency measures, and can reduce the need for emergency assistance funds. And because low-income customers face higher barriers to implementing energy efficiency on their own, it is important that efficiency programs be designed and implemented so as to ensure that low-income customers’ needs are met in ways that work for them, not just for the average residential customer.

4. REVIEW OF PERFORMANCE OF SCE&G’S ENERGY EFFICIENCY PROGRAMS

Q. Please describe the history of SCE&G’s energy efficiency programs.
A. On July 15, 2010, the South Carolina Public Service Commission (Commission) issued Order No. 2010-472, approving SCE&G’s proposed demand-side management programs with modifications, and establishing the Energy Efficiency Advisory Group.4 By Order No. 2013-826, the Commission approved 11 demand-

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4 Order No. 2010-472, Docket No. 2009-261-E.

Currently, the residential programs consist of the following six programs: Home Energy Reports, Home Energy Check-up, Neighborhood Energy Efficiency Program (NEEP), Appliance Recycling, Heating and Cooling, and ENERGY STAR Lighting. SCE&G’s commercial and industrial programs currently include two programs, the EnergyWise For Your Business and Small Business Energy Solutions programs.

Q. Please describe the performance of these programs.

A. As shown in Table 1, the portfolio in Program Year (PY) 4 was highly cost-effective with a Utility Cost Test (UCT) ratio of 3.11. Further, most of the programs (seven of ten that were operational that year) were cost-effective under the UCT. Of the three that did not pass the threshold, the Energy Information Display program had already been discontinued, and the Appliance Recycling program was just launching. Home Performance with ENERGY STAR became cost-effective under the UCT for the first time in PY 4, with a ratio of 1.19. ENERGY STAR New Homes and ENERGY STAR Lighting got high UCT ratios of 3.33 and 6.14, respectively. To put this in context, for every dollar spent on the lighting program, over 6 dollars in benefits accrued to the electricity system in the

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5 SCE&G, Annual Update on Demand Side Management Programs and Petition to Update Rate Rider (Jan. 29, 2016) at 2.
6 Id., Exhibit 1.
form of reduced needs and revenue requirements for generation, transmission and
distribution services in the long-term.\(^7\)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Program Name</th>
<th>Utility Costs</th>
<th>Benefits</th>
<th>UCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>Home Energy Reports</td>
<td>$435,414</td>
<td>$2,410,785</td>
<td>5.54</td>
</tr>
<tr>
<td>Residential</td>
<td>Energy Information Display</td>
<td>$146,993</td>
<td>$63,706</td>
<td>0.43</td>
</tr>
<tr>
<td>Residential</td>
<td>Home Energy Check-up</td>
<td>$598,956</td>
<td>$731,303</td>
<td>1.22</td>
</tr>
<tr>
<td>Residential</td>
<td>ENERGY STAR Lighting</td>
<td>$2,737,684</td>
<td>$16,806,930</td>
<td>6.14</td>
</tr>
<tr>
<td>Residential</td>
<td>Heating &amp; Cooling and Water Heating</td>
<td>$3,192,562</td>
<td>$11,710,461</td>
<td>3.67</td>
</tr>
<tr>
<td>Residential</td>
<td>ENERGY STAR New Homes</td>
<td>$223,122</td>
<td>$742,476</td>
<td>3.33</td>
</tr>
<tr>
<td>Residential</td>
<td>Home Performance w/ ENERGY STAR</td>
<td>$796,564</td>
<td>$948,133</td>
<td>1.19</td>
</tr>
<tr>
<td>Residential</td>
<td>Neighborhood Energy Efficiency Program</td>
<td>$473,524</td>
<td>$443,623</td>
<td>0.94</td>
</tr>
<tr>
<td>Residential</td>
<td>Appliance Recycling</td>
<td>$34,903</td>
<td>$5,648</td>
<td>0.16</td>
</tr>
<tr>
<td>Commercial</td>
<td>EnergyWise for Your Business</td>
<td>$8,032,388</td>
<td>$18,193,011</td>
<td>2.26</td>
</tr>
<tr>
<td>Residential</td>
<td>Total</td>
<td>$8,639,722</td>
<td>$33,863,065</td>
<td>3.92</td>
</tr>
<tr>
<td>Commercial</td>
<td>Total</td>
<td>$8,032,388</td>
<td>$18,193,011</td>
<td>2.26</td>
</tr>
<tr>
<td>All</td>
<td>Total</td>
<td>$16,672,110</td>
<td>$52,056,076</td>
<td>3.11</td>
</tr>
</tbody>
</table>


\(^7\) SCE&G Response No. 1-32 Revised to ORS First Audit Information Request, Docket No. 2016-40-E.
Table 2 shows MWh electricity savings from the programs. Program Years 1 through 5 are verified (ex-post net) savings, while PY 6 savings are forecast.

Table 2. SCE&G program savings, Program Years 1 to 6.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Program Name</th>
<th>PY1</th>
<th>PY2</th>
<th>PY3</th>
<th>PY4</th>
<th>PY5</th>
<th>PY6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>Home Energy Reports</td>
<td>9,311</td>
<td>3,723</td>
<td>12,350</td>
<td>12,541</td>
<td>12,967</td>
<td>11,620</td>
</tr>
<tr>
<td>Residential</td>
<td>Energy Information Display</td>
<td>200</td>
<td>303</td>
<td>356</td>
<td>337</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Residential</td>
<td>Home Energy Check-up</td>
<td>585</td>
<td>1,919</td>
<td>2,423</td>
<td>1,554</td>
<td>1,752</td>
<td>2,902</td>
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<tr>
<td>Residential</td>
<td>ENERGY STAR Lighting</td>
<td>37,320</td>
<td>65,919</td>
<td>54,311</td>
<td>48,401</td>
<td>19,201</td>
<td>7,560</td>
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<tr>
<td>Residential</td>
<td>Heating &amp; Cooling and Water Heating</td>
<td>1,586</td>
<td>10,027</td>
<td>4,660</td>
<td>6,211</td>
<td>5,327</td>
<td>3,290</td>
</tr>
<tr>
<td>Residential</td>
<td>Heating &amp; Cooling Efficiency Improvement</td>
<td>38</td>
<td>501</td>
<td>832</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Residential</td>
<td>ENERGY STAR New Homes</td>
<td>196</td>
<td>910</td>
<td>344</td>
<td>286</td>
<td>305</td>
<td>85</td>
</tr>
<tr>
<td>Residential</td>
<td>Home Performance w/ ENERGY STAR</td>
<td>80</td>
<td>502</td>
<td>285</td>
<td>680</td>
<td>177</td>
<td>-</td>
</tr>
<tr>
<td>Residential</td>
<td>Neighborhood Energy Efficiency Program</td>
<td>-</td>
<td>-</td>
<td>449</td>
<td>1,161</td>
<td>1,187</td>
<td>1,372</td>
</tr>
<tr>
<td>Residential</td>
<td>Appliance Recycling</td>
<td>-</td>
<td>-</td>
<td>12</td>
<td>1,773</td>
<td>1,301</td>
<td>-</td>
</tr>
<tr>
<td>Commercial</td>
<td>EnergyWise for Your Business</td>
<td>8,017</td>
<td>26,820</td>
<td>29,368</td>
<td>25,209</td>
<td>36,447</td>
<td>41,600</td>
</tr>
<tr>
<td>Commercial</td>
<td>Small Business Energy Solutions</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2,157</td>
<td>4,000</td>
</tr>
<tr>
<td>Residential</td>
<td>Total</td>
<td>49,316</td>
<td>83,804</td>
<td>76,010</td>
<td>71,183</td>
<td>42,689</td>
<td>28,130</td>
</tr>
<tr>
<td>Commercial</td>
<td>Total</td>
<td>8,017</td>
<td>26,820</td>
<td>29,368</td>
<td>25,209</td>
<td>38,604</td>
<td>45,600</td>
</tr>
<tr>
<td>All</td>
<td>Total</td>
<td>57,333</td>
<td>110,624</td>
<td>105,378</td>
<td>96,392</td>
<td>81,293</td>
<td>73,730</td>
</tr>
</tbody>
</table>


The portfolio initially ramped up and achieved its highest level of savings in PY 2, reaching 111 GWh of annual incremental savings. Immediately evident is the precipitous decline in savings after PY 2. By PY 5, savings were only 81 GWh, a single-year decline of 16 percent. In PY 6, savings are forecast to decline another 9 percent in a single year. The trend for the residential portfolio is even worse.

Savings in PY5 were only about 43 GWh, a decline of 40 percent relative to PY4, and savings in PY6 are expected to further decrease to 28 GWh, a further decline of 34 percent relative to PY5.

**Q.** How does the performance of SCE&G’s portfolio compare to portfolios of other utilities in the southeast?

**A.** SCE&G’s residential energy efficiency programs achieved between 58 and 68 GWh of annual incremental savings between 2012 and 2014, or from 0.75–0.9
percent of residential retail sales, according to U.S. Energy Information Administration (EIA) 861 data. SCE&G’s achievement in 2014 ranks in eighth place among the top 10 investor-owned utilities (IOUs) in terms of residential electric efficiency savings in the Southeast, as shown in Figure 1 below. Except Entergy Arkansas, all of the IOUs that achieved higher annual incremental savings than SCE&G achieved significantly higher sales as a percent of residential sales, ranging from 1.2–1.6 percent. As can be seen in Figure 1, many of these IOUs increased energy savings substantially in 2013 and maintained a higher level of savings the following year.

Figure 1. Historical Residential EE Savings by Top 10 IOUs in the Southeastern Region (2012 - 2014)

Q. Do you have any observations about the energy savings performance of SCE&G’s individual energy efficiency programs?
A. Yes. The residential ENERGY STAR Lighting program accounts for much of the decline in portfolio savings over that period. The lighting program saw 71 percent
decline in savings from PY 2 to PY 5.\textsuperscript{8} Even more troubling, the savings forecast for PY 6 predicts a drastic decline of 61 percent over just one year.

Q. Why did energy savings from the ENERGY STAR Lighting program decline over this period?

A. Much of the decline in the lighting program savings is likely due to a program design change. The initial point-of-purchase discount model, which involved SCE\&G paying retailers to provide discounts to customers on qualified bulbs and fixtures, was shuttered at the end of PY 4.\textsuperscript{9} In PY 5, program delivery shifted to an online retail service with a supplemental lighting program offered at business office locations to reach customers who may not participate in the online store.\textsuperscript{10} This change was made in order to mitigate concerns that non-SCE\&G customers were purchasing the discounted bulbs.\textsuperscript{11}

Q. What do you think about the change to the delivery of the ENERGY STAR Lighting program?

A. In my opinion, the change in program design was a drastic solution to the concern over non-SCE\&G customers receiving the benefits of product discounts. The Program Year 2 evaluation found a leakage rate of 14.5 percent for the lighting


\textsuperscript{9} SCE\&G, Annual Update on Demand Side Management Programs and Petition to Update Rate Rider (Jan. 31, 2014), Exhibit 1; South Carolina Coastal Conservation League and Southern Alliance for Clean Energy, Comments, Docket No. 2016-40-E (April 1, 2016).

\textsuperscript{10} SCE\&G, Annual Update on Demand Side Management Programs and Petition to Update Rate Rider (January 29, 2016), Exhibit 1.

program before the switch to the on-line store, but the cost-effectiveness of the program is very high: in Program Year 4, ENERGY STAR Lighting had a utility cost test (UCT) ratio of 6.14 and a total resource cost (TRC) test ratio of 4.13. The program’s net benefits are more than enough to offset a reduction in benefits associated with the reported level of leakage. It is also important to note that upstream product models can result in large, sometimes dramatic, increases in participation relative to more traditional, downstream program delivery models.

Q. Do you have observations about other SCE&G programs?

A. Yes. SCE&G discontinued two programs that were cost-effective in PY 4 according to the UCT: ENERGY STAR New Homes and Home Performance with ENERGY STAR.

Q. Why was the ENERGY STAR New Homes program discontinued?

A. There was concern about contractors building to the ENERGY STAR standards even without the program. However, to my knowledge a formal free ridership study has not been conducted.

Q. Do you agree that the ENERGY STAR New Homes program should have been discontinued?

A. No. While high free ridership by contractors would be a concern, it would have had to be very high to negate the substantial benefits of the program, evidenced

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13 Attachment No. 2 to Response of SCE&G to SC Coastal Conservation League and Southern Alliance for Clean Energy’s First Data Request in Docket No. 2016-40-E.
by its very high UCT ratio (3.33 in PY 4). Furthermore, there may be program
design changes that can reduce free ridership, such as requiring building to a
higher standard than the current ENERGY STAR standard in order to qualify for
incentives. Plus, no other SCE&G program addresses this market segment. In its
absence there will be lost opportunities, which occur when efficiency measures
are not installed when it is most cost-effective to do so (e.g., during the
construction or renovation of a building).

Q. What are your thoughts about the Home Performance with ENERGY STAR
program?
A. Comprehensive home retrofit programs can take a while to gain momentum and
gain economies of scale. Also, this type of program offers many other benefits,
and thus it is important to account for them in cost-effectiveness screening.
However, SCE&G's avoided costs do not include the benefits of avoided CO₂
emissions, and it appears that SCE&G does not account for non-energy benefits
(e.g., avoided water use, health and safety, etc.). Even without taking into account
these benefits, however, the Home Performance program became cost-effective in
PY 4. Finally, as with the ENERGY STAR New Homes program, there will be
lost opportunities if it is not offered, because no other programs cover this part of
the market.

15 Attachment No. 2 to Response of SCE&G to SC Coastal Conservation League and Southern Alliance for
Clean Energy’s First Data Request in Docket No. 2016-40-E.
Q. Do you have any comments on the Neighborhood Energy Efficiency Program (NEEP)?

A. Yes. Consistent with how this program has been implemented in other jurisdictions, SCE&G’s NEEP targets neighborhoods with high poverty rates but does not require that individual participants fall into specific income categories. Without more data, it is difficult to know whether NEEP is effectively channeling benefits to low-income populations.

Furthermore, it appears NEEP mainly focuses on the most cost-effective measures, while failing to address other measures that are generally cost-effective (sometimes called “cream-skimming”) and are often provided by low-income energy efficiency programs, such as caulking, weather-stripping, insulation, faucet aerators, and low-flow shower heads. Installing deep energy savings measures such as insulation and HVAC equipment is particularly important, as customers may install standard, inefficient HVAC equipment on their own. Cream-skimming can lead to other lost opportunities as well, because revisiting a customer to install other cost-effective measures may involve prohibitive transaction costs.

Also, savings from programs targeting low-income populations will likely become all the more important in the future, as properly documented low-income program savings may provide higher credit for emissions reductions under the Clean Power Plan’s Clean Energy Incentive Program.

16 SCE&G's January 29, 2016 Annual Update on Demand Side Management Programs and Petition to Update Rate Rider, Exhibit 1.
5. EXPANSION OF SCE&G’S ENERGY EFFICIENCY PORTFOLIO

Q. Are there opportunities to expand SCE&G’s portfolio?

A. Yes. There are a number of changes SCE&G can explore for redesigning or reintroducing existing programs to increase savings opportunities, consistent with the issues raised in the previous section. These include:

- Modifying the design of the low-income program to address all cost-effective opportunities.

- Reinstating core efficiency programs, including the ENERGY STAR New Homes and Home Performance with ENERGY STAR programs. A reinstated Home Performance with ENERGY STAR program should provide incentives for efficiency improvements in manufactured and mobile homes to broaden the reach beyond the geographic areas targeted by NEEP.

Q. Are there other things SCE&G should consider?

A. Yes. SCE&G should conduct studies to shed light on best strategies to address problems or potential problems with its programs. For example, SCE&G should:

- Provide documentation and analysis of the extent of the historical leakage for the lighting program. If the program is cost-effective even with historical levels of leakage, SCE&G should reinstate its midstream offering. In any case, SCE&G should investigate possible modifications to the design of the lighting program to minimize leakage but get the boost in participation associated with upstream or midstream offerings, and implementing design changes as appropriate.
• Study the characteristics of NEEP participants, in terms of (1) individual participants’ income levels relative to 150 percent of the federal poverty guideline and (2) the percent of SCE&G’s low-income customers who have been able to participate in the NEEP. If NEEP is not reaching the lowest-income customers, SCE&G should redesign the program.

• Investigate and report on potential options for offering on-bill financing, PAYS, or another financing mechanism, to facilitate participation by hard-to-reach customer groups.

Q. Are there new programs SCE&G should consider implementing?
A. Yes. As discussed in Exhibit B, there appear to be opportunities for implementing new programs. For example:

• A program focused on promoting high-efficiency new manufactured housing could provide substantial bill savings. Many residents of manufactured housing are low-income, have high energy burdens, and are least able to pay their bills. A program improving the efficiency of manufactured homes would likely provide substantial non-energy benefits, such as reduced collection and uncollectible expenses.

• Additional offerings for commercial and industrial customers may achieve savings that are currently untapped. For example, SCE&G should consider providing financing in support of the existing commercial and industrial offerings, as over one-third of respondents to its opt-out survey noted that
access to project financing might entice them to participate.\textsuperscript{17} Another opportunity for tapping commercial and industrial customers lies with CHP.

Forty percent of survey respondents indicated that they might choose to participate in SCE&G’s energy efficiency programs if incentives were available for CHP.\textsuperscript{18} Other programs that SCE&G should consider include: upstream HVAC, LED troffers (if not currently included in offerings), and strategic energy management.

- Residential high-efficiency appliances are not incentivized under other programs but represent a significant energy use in the South.\textsuperscript{19} Such a program could be mid-stream (providing incentives to distributors to reduce prices) and include incentives to promote market transformation for refrigerators, clothes washers and dryers, dishwashers, humidifiers, and dehumidifiers.

Q. Are there new incentive designs, delivery mechanisms, or program designs that SCE&G should consider implementing?

A. Yes. SCE&G should increase marketing and advertising budgets, consistent with advertising expenditures as a percent of total program budget seen in leading states, in order to bump up participation. Also, wherever possible, SCE&G should seek to develop program designs that maximize participation, to facilitate all

\textsuperscript{17} Id.
\textsuperscript{18} Id.
\textsuperscript{19} EIA’s “other” category of energy use constitutes 33 percent of total residential energy use in the South Region. The other category includes end uses such as cooking appliances, clothes washers, dryers, dishwashers, televisions, computers, small electronic devices, pools, hot tubs, and lighting. (U.S. Energy Information Administration (EIA). 2009 Residential Energy Consumption Survey (RECS) data, Table CE3.4: Household Site End-Use Consumption in the South Region.).
customers taking part in energy efficiency programs and experiencing bill

 reduction benefits.

6. BILL IMPACTS OF EXPANDED ENERGY EFFICIENCY

Q. How does energy efficiency impact customer bills?
A. It is easier and less expensive to save a kilowatt hour than to generate, transmit,
and distribute it using existing resources. At the system level, energy efficiency
programs lower system-wide electricity costs in a number of ways, for example
by reducing operations and maintenance costs (such as fuel) at existing power
plants; deferring or avoiding the need for new generation assets to meet load;
deferring or avoiding the need to construct new transmission and distribution
assets; and more. At the customer level, energy efficiency allows customers to
reduce their consumption of electricity, thus reducing their total electricity bills.

Q. Have you considered possible scenarios for increased deployment of energy
efficiency by SCE&G?
A. Yes. The Synapse report considers two scenarios, the Base Case and the
Alternative Case, relative to a case with no energy efficiency deployment (No EE
Case).

The Base Case assumes a level of energy efficiency investment consistent
with the savings level assumed by SCE&G in its 2016 IRP.

In the Alternative Case, SCE&G’s energy efficiency programs ramp up to
a moderate level of energy savings attainment equivalent to 1.5 percent of
residential retail electricity sales. These scenarios are reflected in Figure 2.
Figure 2. First-Year Residential Electricity Savings: Historical, and 2016 (Projected) and under Two Energy Efficiency Program Scenarios

Source: EIA 861 for historical savings.

Q. Have you considered the potential bill impacts associated with these scenarios?
A. Yes. Highlights of Synapse’s findings on expected bill impacts are presented below.

- For the Base Case, the bill impacts for all customers (assuming bill savings benefits are spread out amongst all customers) are a net negative 0.5 percent, meaning a 0.5 percent of energy bill savings. Projected lifetime net benefits in the Base Case are roughly $92 million.

- For the Alternative Case, average net bill impacts for all customers are negative 1.6 percent relative to the No EE Case. Figure 3 shows the Alternative Case’s projected benefits and costs. Projected cumulative net benefits in the Alternative Case are about $305 million.
Figure 3. Projected Annual Cumulative Benefits and Costs under the Alternative Case

- The difference in total lifetime net benefits between the Base Case and the Alternative Case is roughly $214 million. This means that $214 million in benefits to SCE&G’s customers would be foregone if SCE&G pursues the levels of energy efficiency assumed in the Base Case.

Q. **How should these results be interpreted?**

A. When considering the rate impacts of efficiency programs, it is important to not lose sight of the many benefits of those programs to both participants and non-participants. These may include reduced energy costs, improved indoor air quality, improved comfort, increased customer satisfaction, improved reliability, reduced need for transmission and distribution facilities, reduced use of fossil fuels, and environmental benefits. These benefits can generally be obtained with relatively small increases in electricity rates.

Q. **Can customers do anything to mitigate bill impacts?**

A. Yes. Individual customers who participate in any one of four residential energy efficiency programs (i.e., ENERGY STAR Homes, Home Performance with...
ENERGY STAR, Heating & Cooling and Water Heating, and Neighborhood Energy Efficiency Program) are likely to experience annual energy savings of 6 to 16 percent based on historical experience. For example, a residential customer using 1000 kWh per month who participates in the Home Performance with Energy Star program could save around $20 off their monthly bill, based on historical annual average savings of 14 percent for this program and a 14.4 cent retail rate.

Customers can also participate in more than one program with smaller savings impacts (e.g., Appliance Recycling and the Heating & Cooling Efficiency Improvement program) to reduce their bills.

Q. Will all customers have the opportunity to participate in efficiency programs?

A. It depends. Under the Alternative Case, program funding would be large enough to potentially serve all customers in the first several years, and customers could reduce bills by participating in SCE&G’s programs. In contrast, as shown in Figure 4, the funding for the Base Case will not be large enough to serve all residential customers for many years.
Figure 4. Projection of Potential Cumulative Program Participation Rates

![Bar chart showing projection of potential cumulative program participation rates from 2018 to 2030 with two cases: Base and Alternative Case.]

Source: SCE&G Response No. 1-32 Revised to ORS First Audit Information Request in Docket No. 2016-040-E; SCE&G Responses to First Data Request of CCL and SACE in Docket No. 216-040-E; SCE&G EM&V Report for Program Year 5.

Details of this analysis of program participants are provided in Exhibit B.

7. CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your primary conclusions.

A. I make the following findings:

- The performance of SCE&G’s energy efficiency portfolio has dwindled, but there are ample cost-effective opportunities for the Company to ramp it back up.

- A range of market barriers that impede the ability of customers to implement energy efficiency on their own persist for all or almost all customers. Regulatory policies are necessary to overcome these market barriers, and energy efficiency programs can play a vital role to overcome the barriers.
• Ramping up SCE&G’s energy efficiency programs to a moderate level of energy savings attainment equivalent to 1.5 percent of residential retail electricity sales would likely result in bill savings of 1.6 percent for customers on average. All (or the vast majority of) customers would have the opportunity to participate in SCE&G’s programs in this scenario.

• A lower level of energy efficiency investment, consistent with the savings level assumed by SCE&G in its 2016 IRP, would result in average ratepayer benefits of negative 0.5 percent across all ratepayers. Funding for the Base Case will likely not be large enough to serve all residential customers for many years—well beyond the period considered in the IRP.

Q. Please summarize your primary recommendations.

A. I offer the following recommendations:

• I recommend that SCE&G ramp up its energy efficiency programs and expand its portfolio, using some or all of the enhancements discussed in Exhibit B. In particular, I recommend that SCE&G:

  o Investigate and report on potential options for offering on-bill financing, Pay As You Save, or another financing mechanism.

  o Increase marketing and advertising budgets, consistent with marketing expenditures as a percent of total program budget seen in leading states, in order to bump up participation.

  o Conduct studies to support changes to existing programs; such studies should include assessment of the extent of the leakage for the lighting
program, NEEP participation, and whether to include other cost-effective measures through NEEP.

○ Reinstate core efficiency programs, including the ENERGY STAR New Homes and Home Performance with ENERGY STAR programs.

○ Investigate implementing new programs, such as one focused on promoting high efficiency manufactured housing, and additional offerings for commercial and industrial customers.

○ Develop program designs that maximize participation, to facilitate all customers taking part in energy efficiency programs and experiencing bill reduction benefits.

Q. Does this conclude your pre-filed testimony?
A. Yes, it does.
CERTIFICATE OF SERVICE

I certify that the following have been served with one (1) copy of the foregoing Direct Testimony of Alice Napoleon on Behalf of South Carolina Coastal Conservation League by electronic mail or by U.S. First Class Mail, postage prepaid at the addresses set forth below:

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This 1st day of September, 2016.

s/ Robin Dunn